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TERRITORIAL DEVELOPMENT OF EUROPEAN CROSS-BORDER AREAS FROM THE PERSPECTIVE OF STATISTICAL DATA AND ANALYSES

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Abstract

Border regions are often considered peripheral regions that lag behind in regional development. However, surprisingly few studies have applied statistical data and analyses to examine the territorial development of European border areas. This paper discusses the development of European cross-border areas (CBAs) from the perspective of statistical data and analyses. It considers the territorial development of the CBAs, and the specificities and challenges of statistical data and methods when studying such territorial development. The study makes use of data and methods developed in the Ulysses research project, which was carried out during 2010–2012 as part of the ESPON 2013 program. This paper illustrates how statistical analyses reveal the diverse development of European CBAs, and points out the kind of challenges faced in the statistical analyses of the territorial development of CBAs. The concepts of border area and 'border effect' are used to illustrate these. Lastly, the paper addresses the policy relevance of the research findings, and how this may affect the research process.

Keywords: *Territorial development, cross-border areas, statistical data, statistical analyses*

Introduction

Regional disparities and uneven territorial development are two of the major concerns in the globalizing world. Economic growth, for instance, tends to be concentrated in large cities and metropolitan areas, while smaller regions keep falling behind in development (OECD, 2012, 19). The European Union (EU) has been concerned with disparities in the development of its regions since its very establishment, and the cohesion policy of the EU actually has its roots in the Treaty

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of Rome signed in 1957 (Eskelinen, 2009, 17). The first discussions of the territorial impacts of EU policies were initiated in the early 1990s. In 2001, in the second report on economic and social cohesion, the EU introduced the concept of 'territorial cohesion' to accompany the concepts of economic and social cohesion. The aim of the concept was to pay attention to regional strengths, and to contribute to the sustainable and spatially balanced development of the EU. The report was preceded in 1999 by the adoption of the European Spatial Development Perspective (ESDP), in which the Member States and the Commission agreed on common objectives and concepts for the future development of the EU territory. (European Commission [EC], 2001b; Faludi, 2006, 669; Tewdwr-Jones, 2011, 69)

In the framework of territorial cohesion, border regions have been considered *"crucial test areas for the instruments of the European Regional Policy"* (Ruidish, 2014, 95) because of their diverse socio-economic performance and inherent differences and disparities. One of the main strategies that the EU has introduced to tackle uneven territorial development is cross-border cooperation (EC, 2001b, 4). There exists a large body of scholarly literature focusing on cross-border cooperation (Liikanen, 2010, 26–27; Newman, 2000, 68–69; Perkmann, 2003, 153–154; Scott 2001, 132–134). In comparison, there have been surprisingly few studies to illustrate, with statistical data and analyses, what the territorial development of European border areas actually looks like (for exceptions see Euborderregions, 2015; Grozea-Helmenstein & Berrer, 2015).

This paper discusses the development of European cross-border areas (CBAs) from the perspective of statistical data and analyses, and illustrates the specificities and challenges of studying territorial development in this way. The study makes use of data and methods developed in the Ulysses research project, which was carried out during 2010–2012 as part of the ESPON 2013 program (Feliu et al., 2013). The project examined the development of European CBAs and carried out six full-scale case studies across internal and external EU borders. The studied CBAs were (1) the Upper Rhine Trinational Metropolitan Region along the land borders between France, Germany, and Switzerland, (2) the CBA along the Spanish-French land border (Pyrenees), (3) the CBA along the land border between Greece and Bulgaria, (4) Euregio Karelia on the Finnish-Russian border, (5) Euroregion Pomerania along the borders between Poland, Germany (land border), and Sweden (maritime border), and (6) Extremadura-Alentejo along the Spanish-Portuguese border. (Feliu et al., 2013.) This paper gives a brief summary of the main conclusions of the study, focusing on European scale development trends. In addition, it uses the case study of Euregio Karelia to give a more detailed analysis of some of the

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underlying problems faced by the statistical analyses of CBAs. Euregio Karelia is located at the EU's external border, and therefore it offers additional challenges to statistical analyses as the Russian Federal State Statistics Service data does not necessarily correspond with the Eurostat data.

Traditionally studies concerned with spatial development of border areas have had an economic perspective (Sohn & Stambolic, 2015, 178). Hansen (1977) scrutinized location theory and the growth pole literature dealing with border region issues. He concluded that the literature emphasizes the fragile and threatened nature of border regions, but recognizes that a stable frontier can also have advantages for the economies of the adjacent regions. Ratti (1994, 16) distinguished two different approaches to economic development of border regions that were applied in most studies concerned with spatial effects of borders on regional development. The first approach studies border areas as territories close to institutional borders, and targets the effects that borders have on economic and social life. The second considers borders as external limits and obstacles to communication. More recently, scholars have been inspired by the 'debordering' processes on EU internal borders and studied demographic patterns of border regions across Europe. Brakman et al. (2012) explored how the EU integration has affected the distribution of population in cities and regions along national borders. The results of the study revealed that the EU integration process has had a positive effect on the growth in population share along the integration borders, with the population increasing in large cities and regions in particular. However, border areas remain poor performers compared to more central regions, and even the positive effect of the EU integration process is not sufficient to reverse the relative decline of the population in border areas. Sohn and Stambolic (2015) scrutinized urban development of European border regions, and confirmed that competitive urban centers can develop in border regions. Among these studies, the Ulysses project was the first one to take a multi-thematic approach to territorial development in CBAs.

Regional science and spatial analyses often have a strong policy orientation. The studies aim at producing data and research results that support regional stakeholders and policy makers in developing various policies. The Ulysses research project also aimed at providing local stakeholders with information about territorial development in their own CBAs. In addition, the project informed policy makers on local, national, and EU levels about territorial development trends in European CBAs. (Feliu et al., 2013.) It is by no means simple to produce information relevant on both local, national, and EU levels, which will be discussed briefly in the concluding chapter.

Conceptual framework

The conceptual framework of this article evolves around the concepts of border area and 'border effect'. Without a proper understanding of these concepts, it is not possible to comprehend the challenges of studying the territorial development of CBAs using statistical data and methods. In previous studies, border areas have been defined as *"subnational areas, whose social and economic life is directly and significantly affected by proximity to an international frontier"* (Hansen, 1977, 1), or as *"geographical areas situated along state borders"* (Popescu, 2012, 20). These definitions are loose in the sense that they do not specify how far the border area reaches from the actual borderline. In statistical studies of territorial development, data is generally collected by geographical units (of different scales). Accordingly, the border area has to be defined as a fixed territory that consists of selected statistical units. The researcher has to consider which regional units to include in the analysis in order for the studied area to correspond to the actual area influenced by the border. In this undertaking, the question of scale is of utmost importance: Is it possible to examine the development of border areas or the 'border effect' (how the border affects the territorial development) if the statistical units are too large and cover areas that are not affected by the border?

Popescu (2012, 20) defines 'border effect' as the influence a border has over the surrounding areas. His definition is of a general nature, while the concept has mainly been applied by economists in a more limited sense. For them, the border effect signifies a certain theory of how borders influence trade, and it includes the conundrum of why countries trade more with themselves than with other countries. A significant amount of literature has investigated the border effect in different countries since McCallum's (1995) seminal paper, in which he discovered that Canadian provinces trade more with themselves than with US states. These studies have applied a variety of statistical indicators and analytical methods aiming at improving the econometric analysis of calculating the border effect. What is of interest for this article is that, recently, these studies have highlighted the importance of the geographical component of the border effect. Andresen (2010) has illustrated how regions within Canada and the United States show great variation in trading patterns, while Llano-Verduras, Minondo, and Requena-Silvente (2011) have concluded that if the analyzed sub-units (regional units) are too large, trade between sub-national units may not pick the reduction in value that occurs at short distances. They observed a very large reduction in the border effect when the analysis is performed with smaller spatial units. The following chapters describe how the

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Ulysses project defined the concepts of border area and border effect, and the lessons learnt from the study.

Research materials and methods

The Ulysses research project included three parts, starting with a *multi-thematic analysis*. It focused on the main topics of the territorial agendas of the European Union (EC, 2001a; EC, 2007; EC, 2011), namely (i) cross-border polycentric development, (ii) patterns of urban/rural relationship, (iii) levels of accessibility and connectivity, (iv) effects of demographic change and the level of attainment of (v) Lisbon/Europe 2020 and (vi) Gothenburg objectives. The first four topics represented the *territorial profile* and the two later ones the *territorial performance* of the CBAs. The territorial performance referred to the capacity of the cross-border regions to achieve the Lisbon/EU 2020 and Gothenburg strategy goals (Feliu et al., 2013); the Lisbon/EU 2020 objectives focus on competitiveness and growth, while the Gothenburg agenda stresses sustainable development and the protection of nature (EC, 2001a; EC, 2007; EC, 2011).

The second part of the research was a cross-border governance analysis that aimed at differentiating the various contexts in which cross-border governance is tackled in the European CBAs. In the third part of the study, the findings from the multi-thematic and cross-border governance analyses were fed into an integrated analysis in order to identify key problems and development challenges in the CBAs. Finally, the outcomes were translated into strategies and policy options for local stakeholders. (Feliu et al., 2013.)

This article focuses on the data and the analyses performed in the first part of the Ulysses study, namely the multi-thematic analysis. The following table represents all 56 statistical indicators included in the analysis to represent the six topics of the territorial agendas. The data was collected from various sources as indicated in the table, with most of it gleaned from the Eurostat database, national databases, and previous ESPON projects. Besides the variables in Table 1, additional data was collected in order to analyze the effect of the border on territorial development (Tapia, Wolf, & Chilla, 2013).

Table 1. Indicators of the multi-thematic analysis in the Ulysses study.

(i) Cross-border polycentric development (10 indicators)	Morphological (MUAs) and functional urban areas (FUAs), Population in FUAs, % effective FUA population change 2001–2006, Compactness 2001 (MUA pop. / FUA pop.), Slope of rank size distribution (population), Slope of rank size distribution (GDP), Primacy rate (population), Primacy rate (GDP), Gini coefficient thiessen polygons (%), % population in FUAs	Data sources: ESPON 1.4.3 study, Eurostat, national and regional databases
(ii) Patterns of urban/rural relationship (6 indicators)	Urban-rural typology, Agricultural areas, Urban fabric, Artificial surfaces, Gross value added in agriculture, forestry and fishing, Employment in agriculture, forestry and fishing	Data sources: ESPON DB, Eurostat, Corine Land Cover, national and regional databases
(iii) Levels of accessibility and connectivity (4 indicators)	Potential accessibility road, rail, air and multimodal indexed to ESPON average, Potential accessibility road, rail, air and multimodal indexed to CBA average, Potential accessibility road, rail, air and multimodal index change 2001–2006, Households with broadband internet connection 2009	Data sources: ESPON DB, European Commission 5th Cohesion Report, Regional Innovation Scoreboard
(iv) Effects of demographic change (15 indicators)	Total population, Total population by sex, Total population by age, Population density, Total population change, Population growth rate, Annual population growth rate, Natural population change, Net migration, Crude rate of natural increase, Crude rate of net migration, Total fertility rate, Total, old and young dependency ratios, Commuters to other regions among / by active population, Commuters to a foreign country among / by active population	Data sources: Eurostat, national and regional databases
(v) Lisbon/Europe 2020 objectives (12 indicators)	GDP per capita, Gross value added by NACE, Employment by NACE, Total intramural R&D expenditure, EPO patents by millions of inhabitants, Employment in medium and high tech manufacturing, Unemployment rate, Long term unemployment, Youth unemployment rate, Population at risk after social transfers,	Data sources: Eurostat, ESPON DB (Regional Innovation Scoreboard), national and regional databases

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	Infant mortality rate, Population aged 25–64 with tertiary education	
(vi) Gothenburg objectives (9 indicators)	Soil sealed area, Ozone concentration exceedances, Urban waste water treatment, Share of Natura 2000 areas, Solar energy resources, Wind energy potential, Physical sensitivity to climate change, Social sensitivity to climate change, Economic sensitivity to climate change	Data sources: European Commission's 5th Cohesion Report, ESPON Climate project

Source: Tapia, Wolf, & Chilla, 2013

For the cross-border polycentric development indicators, data was collected by Morphological (MUAs) and Functional Urban Areas (FUAs). The MUAs are municipalities with more than 650 inhabitants/km², or municipalities with more than 200,000 inhabitants and a clear concentrated urban core. The FUAs consist of MUAs as cores and the surrounding commuter catchment areas. For the other indicators, data was collected according to NUTS units. (Tapia, Wolf, & Chilla, 2013.) The NUTS classification is a nomenclature of territorial units for statistics established by Eurostat. In it, the EU territory is divided into four hierarchical levels: NUTS 0 (states), NUTS 1 (major economic regions), NUTS 2 (basic regions for the application of regional policies), and NUTS 3 (small regions for specific diagnoses) (NUTS, 2015a). Smaller territorial units have their own classification as Local Administrative Units (LAU), which is compatible with the NUTS system (NUTS 2015b). In the Ulysses study, the data was collected on all available NUTS levels. Most of the European-wide regional data exists on NUTS 2 or 3 levels, and therefore the lower-level data (LAUs) could only be collected for some of the demographic variables. The data included both standard statistical indicators and indicators developed in previous ESPON projects, which were often based on complex methodologies. The time-frame of the data varied depending on the indicator, but the focus was on the latest available data (in most cases the 2000s up to 2010). (Tapia, Wolf, & Chilla, 2013.)

The data for each indicator was represented on the following scales: (1) the EU27 average/the leading region of the EU27; (2) the national averages of the countries to which the cross-border regions belong; (3) the cross-border regions; and (4) their sub-regions. The different scales facilitated comparisons and allowed understanding of how the cross-border region or its sub-regions were performing in relation to other regions, and to national and EU averages. The other aim was to contribute to understanding how borders affect the regions' performance. (Tapia, Wolf, & Chilla, 2013.)

The indicators (excluding the polycentricity variables) were further subjected to factor analyses in order to compare the CBAs' territorial profile with their performance in terms of the Lisbon/Europe 2020 and Gothenburg objectives. The analyses were made at the NUTS 3 level for all 27 EU countries. The analyses produced European-wide maps, which allowed for the visual comparison of the development of European regions, including CBAs. Regions outside the European Union were not included in the analyses due to the lack of comparable data, and therefore two of the CBAs did not receive complete results from the factor analyses. (Tapia, Wolf, & Chilla, 2013.)

Territorial development trends of European cross-border areas

The multi-thematic analysis produced a vast amount of information concerning territorial development in the analyzed CBAs. Since it is not in the scope of this article to review all the results, only the main conclusions based on the case studies and the factor analyses are discussed in the following. The Ulysses study concluded that territorial development of the studied CBAs differs widely, depending above all on where in Europe they are situated. Their location at state borders is not as significant to their development as their overall location in Europe. For example, CBAs situated in Central Europe have a central location and, among other things, their demographic and economic development has been more favorable than that of the CBAs situated in peripheral parts of Europe. Territorial development of the CBAs thus follows the development of other similarly located regions. Further, state borders divide CBAs into differently performing national parts. Therefore, borders continue to play a major role in the development of the CBAs, and the national level maintains the determining factor in the regions' development. This is also evident in the levels of cross-border commuting, which remain low compared to commuting between regions in the same country. (Feliu et al., 2013, 2.)

Finally, the Ulysses study stated that *"the border condition seems to be more relevant at the regional than at the local level. For example, while the position of the total CBA in the national or European context is clearly relevant, the settlement patterns at the LAU 1 or 2 levels seem often to be indifferent to the border"* (Feliu et al., 2013, p. 2). In the following chapter, this statement is challenged by taking a closer look at one of the case studies, that of Euregio Karelia on the Finnish-Russian border. This case illustrates the crucial role of the definition of the 'border area,' and the data and methods applied in studying the 'border effect' when analyzing the territorial development of CBAs.

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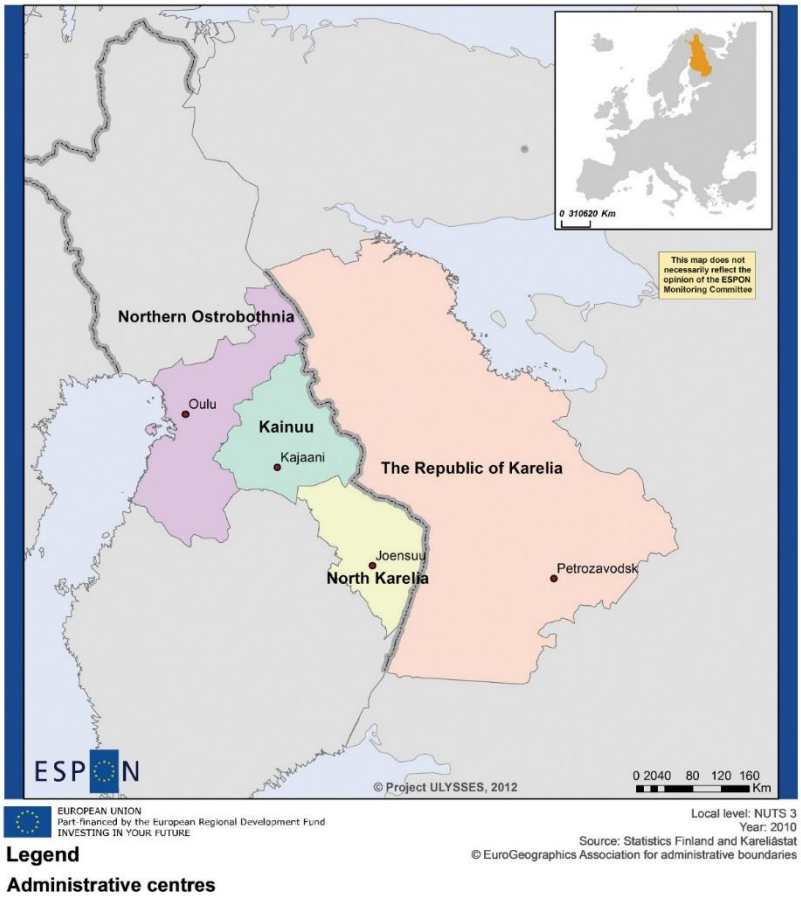
Capturing the border effect: The case study of Euregio Karelia

Euregio Karelia was one of the six CBAs studied on a full scale in the Ulysses project. It is a cooperation area, situated along the Finnish-Russian border, established in 2000 in order for the Finnish and Russian regions to cooperate in improving the well-being of their inhabitants. The CBA has a total area of 270,600 km² and in 2010 it had 1,325,000 inhabitants. Territorially, Euregio Karelia includes three Finnish provinces: North Karelia, Kainuu, and Northern Ostrobothnia. In the east, all of these provinces border the Republic of Karelia in the Russian Federation, which is the only Russian region of Euregio Karelia. (Euregio Karelia, 2015.)

Figure 1. NUTS 3/SNUTS 2-level map of Euregio Karelia.



Source: Kaisto, 2013

From the perspective of the NUTS division, Euregio Karelia appears as follows. On the Finnish side it includes three NUTS 3-level regions: North Karelia, Kainuu, and Northern Ostrobothnia. Two of these regions – North Karelia and Kainuu – belong to the NUTS 2 region of Eastern Finland, and Northern Ostrobothnia belongs to the NUTS 2 region of Northern Finland. Russia does not apply the NUTS divisions to its territories, and therefore a SNUTS (Similar to NUTS) classification was created following the Russian administrative structure. According to this classification, the Republic of Karelia is a SNUTS 2-level region. There is no regional division in Russia that would correspond to the NUTS 3 division, and therefore municipal regions of the Republic of Karelia were aggregated into SNUTS 3 regions, which have around 200,000 inhabitants and thereby fulfill the NUTS 3-level requirements set up by Eurostat. However, the SNUTS 3 regions were used only in the demographic analyses because data had to be aggregated from SLAU 1-level data, and this was not available for most indicators. (Kaisto, 2013.)

A brief summary of the multi-thematic analysis shows that there was a negative population change in Euregio Karelia between 2001 and 2010. The only NUTS/SNUTS 3 regions with a positive population change were Northern Ostrobothnia and the City District of Petrozavodsk in the Republic of Karelia. The FUAs of Euregio Karelia had been attracting more inhabitants than the rural regions, and there were great differences in GDP between the FUAs, especially between the Finnish and Russian ones. In the European context, Euregio Karelia was classified as a CBA with low urban influence and low human intervention. There was a low share of agricultural areas compared to the European average, which was explained by the large share of forests in the overall area. The accessibility and connectivity of Euregio Karelia were low because the CBA is located far from the central European road and rail infrastructure. However, connectivity between the Finnish and Russian regions of the CBA had been improving due to an increase in cross-border traffic. Concerning the Lisbon/Europe 2020 strategy objectives, there were large differences between the regions of Euregio Karelia. The economic performance of the regions was compared to the leading European region (London) and, as a result, Northern Ostrobothnia was classified as a ‘middle-income region’ while the Republic of Karelia was a ‘very laggard region’. The growth of GDP per capita had been strongest in the Russian part of the CBA (in 1997–2008). In terms of the Gothenburg objectives, Euregio Karelia showed low sensitivity to climate change, but environmental issues seemed to pose great challenges for the CBA. The Republic of Karelia had, among other things, a low wastewater treatment capacity, which could eventually affect the whole CBA. (Kaisto, 2013.)

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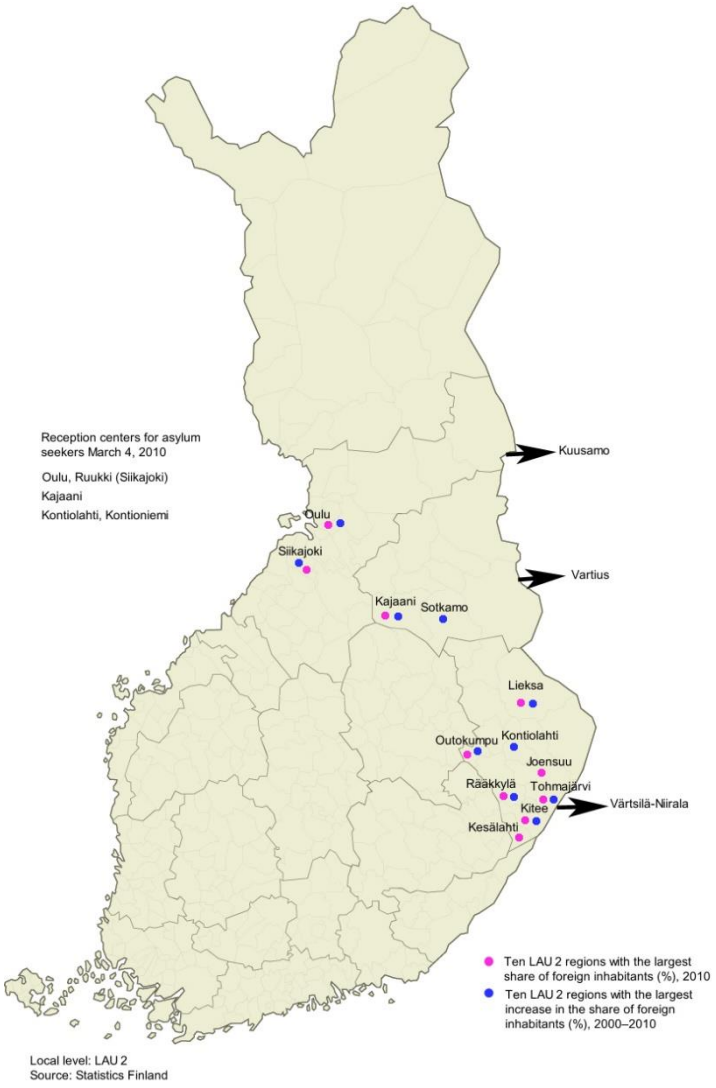
The factor analyses included only the Finnish regions, and concluded that despite Euregio Karelia being physically far away from Central Europe, it scores relatively high in terms of research and development. It also has low levels of pollution. In terms of economic development and urbanization, the Finnish regions of Euregio Karelia are below the European average, and there are significant differences between the performances of the regions. (Kaisto, 2013.) As the above summary illustrates, the statistical multi-thematic analyses yielded a general picture of territorial development trends in Euregio Karelia. When returning to the research questions posed in this article, it is necessary, however, to ask what role the border plays in the development of the CBA. First, we need to consider the concept of border area and look at Euregio Karelia as a territorial entity. From the NUTS 3/SNUTS 2-level map, it becomes obvious that not all territories of the statistical regions are border regions. On the Finnish side, the NUTS 3 region of Northern Ostrobothnia actually stretches across the whole of mainland Finland from the Swedish maritime border to the Russian land border. It would therefore seem problematic to study the development of border regions on a NUTS 3-/SNUTS 2-level in the case of Euregio Karelia. Much of the territory is not located in the vicinity of the Finnish-Russian border, and in the case of Northern Ostrobothnia it remains unclear as to which border affects the territorial development. If one sticks to the definition of border areas as territories located close to state borders, one should use lower-level statistical data. Second, the results of the multi-thematic analysis presented above do not allow for assessing the 'border effect' on territorial development: What trends in the development are related to the border?

These problems were acknowledged in the Ulysses study, and an attempt was made to apply lower-level statistical data and to capture the 'border effect'. This concerned the demographic analyses, as LAU-level data was available only for demographic indicators. A method was developed to study settlement patterns and to discover whether the border is attracting or repulsing population (Tapia, Wolf, & Chilla, 2013.) In the case of Euregio Karelia, the analysis was performed only on the Finnish regions; it used LAU 1-level data and considered three indicators: annual population growth (between 2000 and 2010), population density, and distance to the border as the crow flies (air distance). The result of the analysis was that population growth and density in the Finnish LAU 1 regions of Euregio Karelia are not related to border distance, and thus there is no significant 'border effect'. (Kaisto, 2013, 51–53.) Considering the low population density in Euregio Karelia, it is possible to question the method of studying the 'border effect' with relation to population density. Hence, an additional mapping exercise was carried out and data was gleaned

from Statistics Finland and Kareliâstat (Federal State Statistics Service Regional Agency for the Republic of Karelia). On the Finnish side, it considered the share of foreign inhabitants, the change in the share of foreign inhabitants between 2000 and 2010, and the country of origin, mother tongue, and citizenship of the population in the LAU 2 regions. The exercise illustrated that LAU 2 regions located in North Karelia close to the border crossing point of Niirala-Vârtsilâ had been increasing their share of foreign inhabitants more than other regions. The largest share of foreign inhabitants or inhabitants with foreign origins were from Russia or the former Soviet Union. On the Russian side, the exercise considered net migration on an LAU 1-level between 2001 and 2010, and detected that migration flows were concentrated on the city district of Petrozavodsk and the two regions surrounding it. Based on the mapping exercise, it would be correct to claim that a 'border effect' exists in Euregio Karelia, and that it concerns settlement patterns in the regions located along the Finnish-Russian border in North Karelia. (Kaisto, 2013, 51–53)

Figure 2. Results of the LAU 2-level mapping exercise in the Finnish regions of Euregio Karelia.



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Research findings

This study shows how statistical analyses reveal the diverse development of European CBAs. In light of this result, it would be more correct to speak about diverse CBAs with diverging patterns of territorial development, rather than peripheral border areas that are lagging behind in territorial development. The paper points out some challenges in applying statistical data and analyses to the study of territorial development in CBAs. First, the data and analyses are dependent on how the border area is defined. If the scale is too broad and the applied regional units include territories outside the border area (or even territories across the country), the results do not portray the development of border areas, but of regions in general. Thus, if the border area is understood as a territory close to the state border, the scale of analyses should be adjusted accordingly. This finding is supported by studies examining the 'border effect' on trade, which also discovered distortions in results if overly large geographical sub-units (regional units) were used in the analyses (Andresen, 2010; Llano-Verduras, Minondo, & Requena-Silvente, 2011). In their study of the urban development of European border regions, Sohn and Stambolic (2015) refrained from using the NUTS 3 regions considering them too heterogeneous for a comparative analysis. Brakman et al. (2012), on the contrary, used NUTS 3 level data (judging by the amount of regions analyzed) in their analyses on how the EU integration has affected the distribution of population in cities and regions along national borders. One could discuss the accuracy of their results with regard to regions that cover large territories and reach far from the actual borderline.

In statistical analysis, distortions related to the spatial units used are referred to as the Modifiable Areal Unit Problem (MAUP). The ESPON 3.4.3. -project studying the MAUP illustrated how the study of border regions and the effect of the border on regional development is sensitive to the size of the spatial units and to the spatial extent of the study region. MAUP could be reduced, among other things, by applying smaller spatial units to the analyses. (Ben Rebah et al., 2006) The problem in the Ulysses project was that the study had to produce European-wide research results, and low-scale data was available only for certain indicators. Further, the methods applied in studying the 'border effect' influenced the results. Border areas with high and low population densities could not be studied using the same methods when determining border effects on settlement patterns in border areas. In this sense, the study of border areas faces the same challenges as European-wide comparisons of territorial development in general. Eskelinen and Fritsch (2006, 54) have pointed out that the existence of significant regional disparities is one the most relevant and challenging aspects when positioning a certain region in a European context. The

Nordic countries, for example, have taken it into their agenda to highlight how analyses performed on NUTS 2 level obscure the different types of geographical zones within the Nordic territorial structure (Damsgaard et al., 2008, 10). The diversity of border areas, thus, poses concrete problems in defining the border area and studying the border effect.

Discussion

Ruidisch (2014, 95) argues that territorial cohesion is the least well-defined concept of the terms tackling uneven territorial development in the EU: social, economic, and territorial cohesion. When carrying out statistical analyses that aim to produce information concerning territorial cohesion – namely the territorial development of CBAs in the EU – scholars face several choices and challenges. These include, among others, the selection of indicators to best portray the topics of the territorial agendas, selection of data and scale/scales of analysis, and methods to capture the 'border effect'. Often, scholars do not make these choices independently, but in collaboration with policy makers and local stakeholders.

The Ulysses study included close collaboration with local stakeholders and regional and EU-level policy makers. It had to include a common methodology for all the case studies, with both quantitative and qualitative approaches to facilitate generalizations and the identification of wider European tendencies. At the same time, it aimed at producing locally relevant research results. (Feliu et al., 2013; Németh, Németh & Kaisto, 2013.) These requirements naturally resonate on the research process and results. Statistical data and analyses have the ability to present territorial development trends on different territorial scales efficiently and understandably. Illustrative maps, tables, and charts can be composed from the research results, which makes it easy to collaborate with policy makers and stakeholders. However, as the current study demonstrates, statistical methods for studying border areas and measuring the border effect on territorial development should be further developed. The results of studies sometimes offer distorted information for the purposes of policymaking depending on the applied spatial level or methods of analyses (Ben Rebah et al., 2006, XXIX–XXX). Finally, there is a lack of cross-border data and methods for analyzing cross-border phenomena. These would be topics for future research on the territorial development of European CBAs.

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