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Geographical interpretation problems surrounding the
question of how to determine the spatial extent of
near-border areas

Abstract of the Ph.D. dissertation

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I. THE REASONS BEHIND THE CHOICE OF THE SCOPE AND THE MAJOR AIMS OF THE STUDY

Research connected to near-border areas may seem out of date at the first sight, with a wide range of publications and clarified information touching upon this question available. However, once you dig deeper and deeper into the topic, you ultimately realize that the above mentioned statement is by no means adequate.

Surprisingly, the first step to be taken during such works was postulated by Gyula Krajkó even almost two decades ago, when the very first studies of Hungarian near-border regions initiated. „The exact delineation of the mentioned area is by no means without problems. One cannot uniformly consider a 30-35 km zone along the country’s borderline to accurately correspond to the zone of near-border region.... An adequate approach might be the investigation of economic and social factors for a wider area along the borderline, possibly extended to the entire area of the county under investigations. This way the received results may yield a better picture on the actual geographical extension of the near-border region.” (*Gy. Krajkó 1988*). Numerous research papers and surveys have come to light since then all discussing the social and economic status of the areas lying along the country’s borderline. However, none of them has taken into consideration this piece of advice.

The majority of regional surveys and studies are implemented within the framework of clearly defined and delineated areas (region, county, minor region). Conversely, no uniform method for delineating the study area is known in the almost two decade-long history of investigations connected to the near-border areas. The highly different methods employed by the individual researchers in setting the spatial framework of their works hampers the possibility of correct result interpretation and comparison of

the individual findings; i.e. the chance of finding a correct answer to the role of the borderline in the economic growth or retardation of certain areas.

The aim of the present work is to present various methods suitable for an accurate delineation of the near-border regions along with touching upon the issue of what factors in what way may influence the final picture. To achieve this goal the following topics will be discussed at length:

- An overview on the research history regarding investigations of near-border areas in Hungary along with the methods applied for the spatial delineation of these.
- the allocation of different types of near-border regions
- the concrete analysis of a social and an economic factor using the right indicator index within the delineated areas:
 - for a better comparison of the different areas the population density is used as a suitable social index,
 - the spatial distribution of enterprises run by people from the neighboring countries in Hungary are used as a suitable economic index,
- the comparison of the gained results with those of previous studies with a similar scope, deduction of the adequate conclusions.

II. METHODS APPLIED AND THE GAINED RESULTS

Due to the inherent nature of the scope of our research a collective presentation of both the utilized methods and the gained results seems highly appropriate, as the definition of the notion of a near-border location required the introduction of new research methods and yielded outstanding new results as well.

As a first step, a general overview of the results of studies implemented so far is given taken from the literature. The embedment of international

analogue examples into our work is highly problematic as the size of the individual countries under study significantly determines the way the spatial extent of the near-border areas are set. As in the case of larger countries covering several million square kilometers (USA, Russia, and China etc.) a 100 km-wide zone taken to correspond the near-border region is quite acceptable. Conversely, in the case of smaller countries like Hungary nobody would ever consider a settlement located 80-100 kms away from the border to be a part of this zone.

So in the case of Hungary local examples had to be utilized as inferred from the available literature pointing into all possibly available geographical directions except for one. The versatility surrounding the definition of the notion of a near-border area and location among the Hungarian researchers is clearly exemplified by the numerous newly prepared maps presented next to one another in their publications.

A significant part of our work was dedicated to develop an accurate method, which is uniformly applicable to the determination of the spatial extent of the near-border region. The basic notion our work was based on is that the borderline as a vector-like attribute serves as a primary reference line. The distance from this reference line, or whether or not a settlement is in direct contact with the borderline, are fundamental issues in determining the possible role(s) of the actual borderline in the life and development of the settlement under study. For the delineation of near-border areas three steps were applied:

1. from the different regional units those in direct contact with the borderline are chosen,
2. the preparation of artificial zones via drawing lines at a certain distance from the actual borderline and using these to assign areas located within these zones,
3. the use of regional units determined by provision of law

In the *first case*, regions are not suitable for the purpose of near-border investigations, counties are usable only partially. However, minor regions are best suited for this approach as their direct contact with the borderline can be unambiguously determined in a relatively simple way. Nevertheless, the peculiar shapes of the individual minor regions may yield large differences in the actual distance of the individual settlements in that minor region from the borderline. From the settlements those with their administrative areas being in direct contact with the borderline were considered as near-border settlements. Their selection happened using the map of administrative areas of Hungary. In some less univocal cases county maps offering better spatial resolution were also utilized. In other cases, when only a small point-like part of the administrative area of a settlement had direct contact with the borderline it was difficult to make the right assignment. Their elimination from the study would surely have interrupted the continuous line of the zone of settlements located along the border. Thus they were assigned into the group of settlements located right on the borderline as well. This way 311 settlements were put into the group characterized by a location right on or along the borderline. However, differences in the size of the individual settlements of the group created a zone with not a uniform but slightly fluctuating width.

In the *second case* of delineation, lines are drawn at a given distance from the borderline to create zones, and the individual settlements are grouped on the basis of which zone they fall into (distances in zone assignment mean aerial distances). This task was implemented using the Mapinfo software package. As a first step, lines taken at 25 km intervals were drawn at distances of 25, 50, 75 and 100 km from the borderline. Afterwards, within the first 25 km- wide zone further subzones were created at 5 km intervals. The newly created zones and subzones cover the entire area of Hungary. The number of zones depicting a distance of more than 100 kms from the country' borderline is negligible.

The next step included the selection of settlements within the newly established zones. As the shape of the individual settlements varies case by case, the delineation lines used for the creation of the zones cross them at different places. Considering these problems, plus the fact that the group of settlements directly located along the borderline was created on the basis of a cross-point of their administrative areas with the borderline, the settlements were assigned into the group of the referred zone if at least half of their administrative areas are found within the created borderlines of the zone. As the assignment process started from the direction of the borderline moving towards the central parts of the country, settlements “halved” in the above mentioned way were thus assigned into the zones located in the direction of the border. This process yielded five 25 km-wide zones in Hungary.

Once these 25 km-wide zones are established, the one closest to the actual borderline was further investigated. The subdivision of this zone by lines drawn at 5 km intervals enabled a quantitative decision whether or not there are any differences among these minor zones which can be attributed to the vicinity of the borderline. Again this high resolution classification was not extended to the other 25 km wide-zones beyond the distance of 25 km from the borderline. Thus the settlements beyond this distance were classified in accordance with the 25 km division of the area to enhance easy comparison.

There was another option, which seemed promising to try. Fundamentally, it employs the classification steps of the method used for establishing the 25 km zones with the exception that the settlements located directly on the borderline are treated as a separate category. The different groups of the employed zones in the classification methods are depicted in Table 1.

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Table 1. The three groups of distance zones employed

Detailed zones	25 km zones and direct zones	25 km zones
Direct	Direct	0-25 km
Less than 5 km, but not direct	Less than 25 km, but not direct	
5-10 km		
10-15 km		
15-20 km		
20-25 km		
25-50 km	25-50 km	25-50 km
50-75 km	50-75 km	50-75 km
75-100 km	75-100 km	75-100 km
More than 100 km	More than 100 km	More than 100 km
Hungary	Hungary	Hungary

In the third case the categories of the regional units determined by provision of law are utilized. Surprisingly, the collection of provisions contains 198 cases, where the notion of near-border location is mentioned. However, none of these describes a uniform, unambiguous method for the exact determination of what it entails. The act on regional development (1996. /XXI.) mentions only the disadvantaged near-border areas without explaining the notion of what a near-border location means.

I have come across a concept in the act of border control related to the areas along the border (1997. / XXXII./ 4.§) referred to as borderline areas. This act, and the 66/1997. Enactment of the Ministry of Domestic Affairs can mean the only starting point in this work.

As this referred enactment was valid during the 2001 Population Census, the settlements mentioned served as a basis of our investigations. The enactment lists 776 settlements. However, after some necessary modifications only 775 instead of the 776 settlements were considered in our analysis. The referred 775 settlements are under the supervision of 74 border control agencies belonging to 9 directorates. Compared to the size of near-border minor regions or near-border settlements, this zone has a more uniform spatial extent, lacking large-scale fluctuations than the individual system of minor regions of settlements.

These units seem suitable for an analysis detailing the possible influences of the vicinity of the borderline at the first sight. However, they are not fully compatible with the trajectory of the country's borderline, let alone that of the borderline of the individual counties. The areas under the supervision of the border control directorates are entailing either only a part of the actual borderline of the neighboring country, or a borderline with multiple bordering countries. In many places the border control directorates are made up of highly segregated minor units, especially along the western borderline of Hungary. However, these small units can be clustered into greater units according to their position on the borderline regarding the type of the neighboring country. The creation of such greater units for the individual borderlines could have been easily and implemented with relatively great accuracy. There were only three cases where the interface of borderlines of three different countries posed problems. In the case of the interfaces of the Ukrainian-Romanian, Austrian-Slovenian and Austrian-Slovakian borderlines, a single category per type was set up recording the names of both neighboring countries.

For the *demographic analysis* data deriving from the *2001. Census of Hungary*, with the regional division and recorded settlements valid at the time were utilized. This included 3 135 individual settlements out of which 252 were cities. The remaining types from an administrative sense are incorporated towns, geographically speaking major and regular villages. These were put into a single category listed no town type settlements. This category is a synonym of village, both appearing in the text.

It became apparent even after the careful scrutinization of the available literature on the problematics of near-border location, which as the majority of researchers righteously noted, the final result of such type of works is greatly influenced by the *composition and distribution of the settlements under study*. This recognition led some researchers to omit certain settlements, mostly cities, from their analyses, which eventually yielded

even worse results. To find an accurate solution to this problem three systematic approaches were utilized in the thesis for the calculations. The first approach included all the settlements of the studied zone or unit for the calculations. The second one did the same for only the cities, where the cities and municipal cities are treated in a single category with the exception of the capital Budapest. Finally, the analysis was carried out to the no city type settlements. And the comparison of the three outcomes yielded the final result.

Besides the population, another important factor to be investigated to reveal the possible influences of the proximity of the borderline was *the distribution of the enterprises run by citizens of the neighboring countries*. Unfortunately, far less information is available on the role and presence of citizens of neighboring countries in the Hungarian economy compared to the investments of other developed countries. Although the capital power of these countries regarding investments to Hungary is way below that of the developed countries with the exception of Austria, they have an equally important role in the Hungarian economy as the 5 major western investors, when the number of established enterprises is regarded.

There is a complete shortage of available information on the economic organisms of the neighboring countries. Furthermore, sometimes the available information in the different resources is also contradictory. Data deriving from the two most important economic data source the Central Hungarian Census Office (KSH) and Tax and Monetary Revision Office (APEH) are no exceptions, as they are recording these economic organisms from different points of view. These differences are not as major in the case of western countries appearing as actual investors with greater capital funds. However, the discrepancies in the data recorded by the two offices is highly significant in case of the enterprises established by the citizens of neighboring countries, with less capital power but in significant number. For these reasons data for our work derives from the data base of the

CompLex CD Céghírek – KJK-Kerszöv Law and Business Press Ltd. recorded for 30th June 1999. Data deriving from the Central Hungarian Census Office (KSH) were used as addition only in our work.

As shown by *our final results*, the statement, considered valid for almost two decades, and according to which *the near-border regions are disadvantaged compared to the other areas of the country and suffer demographic loss was disproved*.

Whether or not the capital city Budapest enters the analysis yields significant differences in the final outcome. For this reason, in a country-wide comparison it should be embedded in the analysis. However, in case of a higher resolution city-village comparison approach it is best to be omitted even from the list of cities as well. This statement can be debated on the basis of nobody can treat the capital as an empty spot in the analysis. However, I guess we would get the same result in the case of the southern near-border areas if it was located somewhat northward from its present day position. So thanks to its unique roles and importance in the country's life it is no match with any other cities in Hungary, and as such must be omitted from the analysis.

To study the extent of economic influences deriving from the neighboring countries (e.g. the distribution of foreign owned enterprises) a county-scale investigation can be a good starting point. However, it is worth stepping forward to the level of settlements, as this is the level where the most important regional differences can be depicted. In case of the level of counties, there is no general rule on the influences deriving from a communication with the neighboring areas (see e.g. the Romanian enterprises).

There is always *a need for an adequate comparison basis* for any kind of analysis. Using distance zones, the entire area of the country can be divided into equal, comparable unit areas, but the country's average values

should also be mentioned. Besides the near-border units, the country's indices and those of the inner areas can also be depicted.

In several cases a further increase in the resolution of the study is worth considering, like a comparison of the received data to the general indices of even smaller regional units. A good example might be data coming from the border control directorates, and the individual borderline fragments. A further refining possibility might be the comparison of such data to those of the county's average. As these values are often above the country's average, but when a county-level comparison is concerned they are below the county's average or vice versa.

A fundamental change in the approaches utilized so far for studying the near-border areas is worth considering. As the majority of investigations implemented so far was focusing to areas in the vicinity of the borderline, and these can be areas of highly different sizes as we have already pointed out not to mention the differences deriving from the segmentation of the borderline. As our work clearly outlines it is possible to set up comparable regional units at a cross-country scale and utilize their indices in a comparison with those of the near-border areas. In the first step the data at hand is suitable for a probe analysis, be it economic or social type and regardless of its size. In case of an empirical approach, the job is not as easy as there is no chance for a complete overall comparison. All one can and must do is to take samples from other areas of the country, with not a near-border location and implement a same type of calculation. This can be carried out for the entire borderline, depending on the available time and resources. However, it's worth looking for analogue settlements which are characterized by similar endowments regarding administrative status, geographical and transportation location, age structure, distribution of nationalities etc.

An important methodological innovation of our work was the determination of which categorical units can be utilized and how they should be established in a research concerned with the near-border areas.

The notion that the division based on 1 km distance units should be started right at the settlements on the borderline was proven to be wrong, yielding discrepancies in the uniform distance categorization (e.g. density of settlements). It also distorts the values of the next larger 5 km unit categories, as into that category only the remaining smaller settlements are sorted.

It seems more appropriate to establish equal distance zones from the borderline at e.g. 5, 10, 20 or 25 km intervals, even if these zones not form a complete circle around the border. A parallel use of the regional units along the border (settlements right on the borderline, minor regions, MDA border region) is also advantageous to shed light onto the existing differences.

III. POSSIBLE UTILIZATION OF THE RESULTS

The interpretation of the notion near-border location is a major basic research project with direct utilization possibilities in such areas as development planning, project application preparations and actualizations, especially in minor area organizations, cross-country relations, administrative and spatial structural transformations, and the localization of the participants of a country's economy. The final results of our research may give helpful hints in these works.

Researchers dealing with the referred topic were given a suitable method for utilizing uniform spatial units in their future works enabling a better comparison of results for the different parts of the country. Information presented in the appendix protects them from additional months or years of

time-consuming, tedious hard work by listing the collected data for the different regional units. Plus it also reveals what unique regional factors and which way can distort the final picture for the individual units.

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