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DIRECTIONS FOR DEVELOPMENT OF TRANSBORDER AREAS – STATE AND PROSPECTS

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ABSTRACT

The processes of integration in Europe cause the need for more and more information concerning transborder areas, thereby growing interest in regional statistics. The reason for this is mainly changes of functions of the borders caused by globalization process. The need for using the results of transborder surveys on the micro-mezo-macroeconomic level gives rise to establishing a consistent research system for these areas. Despite efforts of several international institutions, there still exist problems with lack of information on particular levels of aggregation as well as with data comparability level in individual countries. As a consequence, there is still a need for identification of major research areas and discussion on important methodological aspects relating to transborder areas.

Introduction

Due to globalisation processes the economy becomes a blurred system in many cases, with supranational labour markets as well as goods and services markets being created. On the one hand, we can observe integration processes. The most recognizable one in Europe is the extended Schengen Area. On the other hand, disintegration processes are visible.

In the countries where the Schengen Area is being introduced, open borders facilitate communication, running business, etc., but they generate many information gaps. The removal of border controls and cessation of recording the traffic of people and vehicles cause the information deficit in this regard. This is why there is necessity of replacing the lost source of information through retrieval of data in another way.

What is more important is the fact that opening the borders in some countries usually leads to tightening the rules of crossing the borders in others, in this case at the EU's external border. It is the reason why we can frequently observe higher intensity of non-registered socio-economic phenomena in this area.

Therefore, integration and disintegration processes cause the need for more and more information concerning transborder areas, thereby growing interest in regional statistics.

Regional statistics often comes across different problems of, among other things, limited availability of data for areas located on both sides of the national border, lack of information on a certain level of aggregation in individual countries and low level of data comparability, especially those pertaining to economic issues.

Therefore it is essential, to create a coherent research system for cross-border areas which would allow for gathering and analyzing comparable data from sample surveys and administrative registers.

In response to a greater demand for information Polish official statistics resumed in 2008 the survey of goods and services turnover in border traffic. Initially, it was carried out on the Polish-Ukrainian border, and since 2010 at the whole European Union's external border on the territory of Poland.

Results of this survey turned out to be unexpected. For example, in the first half of 2011 the expenses incurred on the purchase of goods in Poland by Ukrainians amounted to 277,8 million € whereas by Byelorussians amounted to 173,4 million €, what account for 18,5 % and 23,9 % of the whole Polish export to these countries respectively. Thus, it came out that the scale of unregistered trade is surprisingly high.

Towards transborder index

In order to create the coherent research system for transborder areas, the first think which should be done is delimitation. We have to begin with preliminary delimitation based on, for example, regulations such as Regulation No. 1931/2006 of the European Community, dated 20 December 2006, according to which the border zone covers an area of 30 to 50 km from the border. Another important criterion of delimitation can be results of the questionnaire surveys at the border, journeys to work, etc.

The survey of goods and services turnover in border traffic at the European Union's external border on the territory of Poland, which took into consideration distance from the border to the place of residence of Poles and foreigners, showed that the highest number of foreigners and Poles was making purchase at the distance of up to 50 km from the border – around 71% and 96% respectively, with almost 55% foreigners and about 94% Poles making purchase in the zone of up to 30 km. In terms of the distance from the border to the place of purchase the highest number of foreigners and Poles was making purchase at the distance of up to 50 km from the border – around 71% and 96% respectively, with almost 55% foreigners and about 94% Poles making purchase in the zone of up to 30 km.

Creating a coherent research system we have to remember about dynamic delimitation which means systematic analysis of socio-economic phenomena in

this area and environment (e.g. labour market, entrepreneurship, demographic processes, tourism, differences in the level of prices). For this reason Polish official statistics launched two modules – monitoring of socio-economic phenomena in cross-border areas on the basis of administrative registers and statistical databases as well as sample surveys at the border and in the neighbourhood.

All sorts of information which can be found in statistical databases and administrative registers adjusted to transborder areas fall within the ambit of the monitoring. Most of the findings of our investigations argue that there is higher activity in transborder areas.

The plan of actions which should be taken up, that is the scope of surveys and the schedule of their implementation, was worked out. Firstly, four kinds of surveys should be conducted: questionnaire survey at the border, survey of travelling foreigners in tourist accommodation establishments, household survey (modules concerning international tourism, unregistered work, volume of unregistered purchase), and survey of unregistered economy (market points, retail sales points, etc.), with the use of experience of Gray Economy Research Centre.

Being in possession of great variety of partial indicators based on monitoring and data of surveys on the one hand, and observing ongoing specific changes in transborder areas on the other, a natural consequence seems to be the development of synthetic indicators.

In spatial analysis, where areas of different countries are being surveyed the problem is the choice of the object of a study. We must not forget about the need to compare spatial units which are similar especially in terms of population and area. It is worth stressing that because of these two criteria, the spatial breakdown varies in different countries.

According to the above we should avoid comparing some administrative units in individual countries, although these units fulfil the same administrative functions.

Based on many years of experience in the development of common transborder information system, it should be noted that the best spatial unit is LAU level 1. In many countries administrative units on this level are very comparable in terms of population and area.

Creation of complex feature

In order to investigate differences in development of territorial units at various levels of aggregation, we can use a synthetic indicator. This index, as it is well known, is constructed based on partial indicators which may come from different fields. They can be used to analyze a specific area of research (e.g. economy, human capital, environment) or the general socio-economic development of a given region.

In the selection of partial indicators both substantial and formal criteria are taken into account. A properly selected set of variables should describe the

phenomenon under study as precisely as possible, and at the same time be not too numerous. The next step is to use various statistical methods including correlation and regression analysis to eliminate the variables that contain the same or very similar information on the investigated phenomenon, or showing little variability. It is important that empirical data should be available for each region and comparable between them.

A set of comparable variables available at NUTS 2 and LAU 1 was prepared for Polish-Slovakian-Ukrainian border area, which includes:

- Population per 1 sq km (NUTS 2)
- Population at age 15-64 in % of total population (NUTS 2)
- Net migration per 1000 population (NUTS 2, LAU 1)
- Infant deaths per 1000 live births (NUTS 2, LAU 1)
- Natural increase per 1000 population (NUTS 2, LAU 1)
- Students per 1000 population (NUTS 2)
- Doctors per 10 thousand population (NUTS 2)
- Average monthly gross wages and salaries (NUTS 2)
- Entities of national economy per 10 thousand population (NUTS 2, LAU 1)
- Gross domestic expenditures on R&D per 1000 population (NUTS 2)
- Number of beds per 1000 population (NUTS 2)
- Number of foreign tourists per 1000 population (NUTS 2)
- Tourist traffic intensity index by Charvat (NUTS 2)
- Percentage of employed persons in market services (NUTS 2)
- Employed persons per 1000 population (NUTS 2)
- Dwellings completed per 1000 population (NUTS 2, LAU 1)
- Unemployment rate (NUTS 2)
- Gross Domestic Product per capita (NUTS 2)
- Area of national and landscape parks in % of grand total area of unit (NUTS 2)
- Emission of particulate pollutants from plants generating substantial air pollution per 1 sq km (NUTS 2)
- Emission of gaseous pollutants from plants generating substantial air pollution per 1sq km (NUTS 2)
- Forest cover in % (NUTS 2).

Domain set of variables - "Society and environment":

- Internal and international net migration for permanent residence per 1000 population (NUTS 2)
- Infant deaths per 1000 live births (NUTS 2, LAU 1)
- Population at non-working age per 100 persons at working age (NUTS 2)
- Natural increase per 1000 population (NUTS 2, LAU 1)
- Median age (LAU 1)
- Industrial and municipal sewerage treated in % of sewerage requiring treatment (NUTS 2)

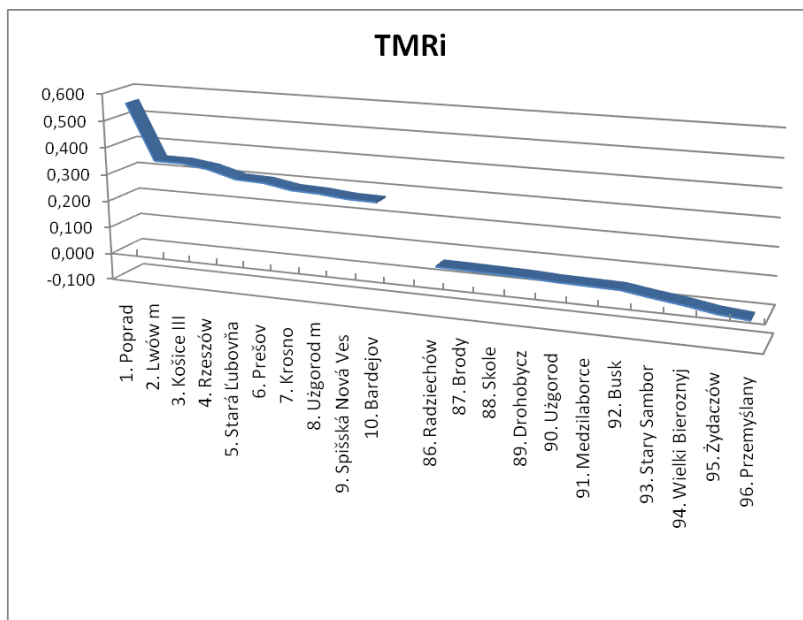
- Emission of particulate and gas pollutants from plants generating substantial air pollution per 1 sq km (NUTS 2)
- Legally protected areas possessing unique environmental value in % of total area (NUTS 2)
- Forest land area per capita in ha (LAU 1)
- Municipal waste collected per capita in kg (NUTS 2).

To obtain the taxonomic measure of development the following steps should be taken. First, a set of variables which contains essential elements undergoes the process of standardization. As a result, a matrix of standardized values of features is obtained. Then, a set of the taxonomic patterns, whose coordinates are given in the form of a vector is being determined. In relation to the pattern, distances are calculated for each tested object (region), using the Euclidean metric. In this way, taxonomic measures of development of objects are being obtained, which undergo the process of standardization. They take values whose level depends on development of an object or region – the more developed the object is, the higher values the measure takes.

Taking into consideration spatial units on NUTS level 2, we receive the following ranking, in which Małopolskie voivodship is placed first and Volyn oblast is ranked last.



As far as the units on LAU level 1 are considered, a similar ranking can be created, in which Poprad from Slovakia is ranked the highest and Przemyślany from Ukraine the lowest.



Stages of SWOT analysis of administrative units with the application of the Analytic Hierarchy Process (AHP)

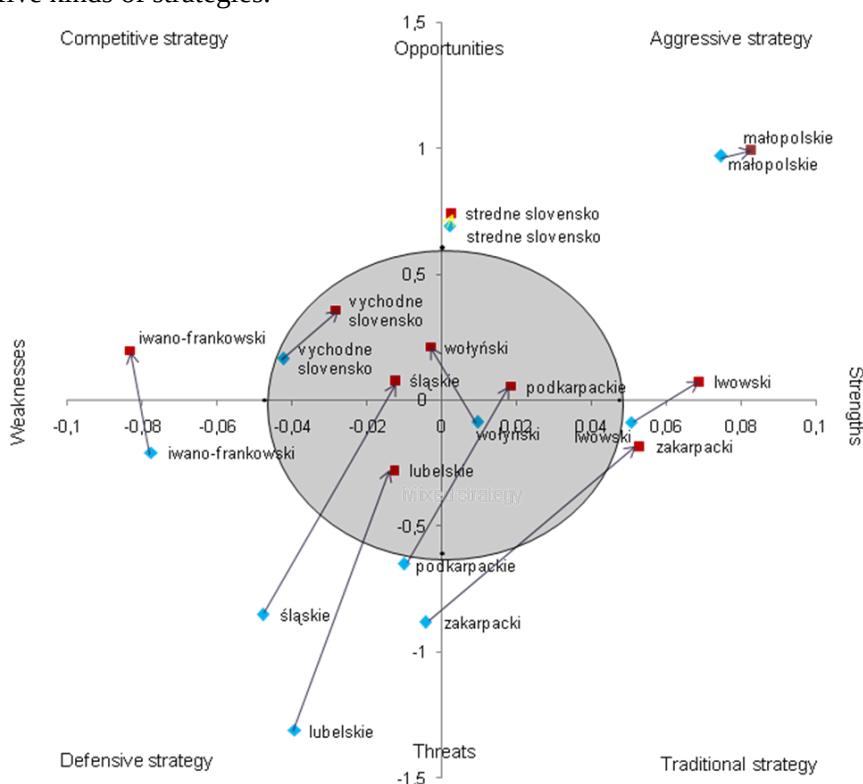
AHP allows one to assess the validity of the factors affecting the development of local units (strengths and weaknesses as well as opportunities and threats), to determine their synthetic assessments of internal and external conditions, and on this basis, to identify the types of developmental units.

Construction of two hierarchical structures related to the external and internal conditions of socio-economic development – specification of the strategic fields and an appropriate choice of sub-indicators for them (selected elements of a SWOT analysis of administrative unit) is the first step in developing this indicator. Then, experts assess the chances and risks as well as strengths and weaknesses of particular administrative unit. The next one important stage consists in determining indicators weights of the SWOT analysis with the application of the AHP method. The AHP method involves pair-wise comparison of SWOT indicators at each level of the hierarchy with the application of the *Saaty's Scale*. *Saaty's Scale* defines the nature of dependency (e.g. an index has the same significance as the second one, an index is absolutely more important than the other). Verification of the correctness of carried out comparisons with the application of the *CR marker*, which determines the extent to which cross-comparisons of the characteristics are consistent, as well as standardization of indicators in cross-administrative units are also significant. The last two steps

include calculation of coordinates value of administrative units position in terms of external and internal development conditions, and presentation of the position of administrative units on in the diagram that is divided into quarters representing four types of growth strategies: aggressive, conservative, defensive and competitive.

Aggressive strategy (maxi-maxi) is created for areas where strengths and opportunities prevail in their environment. This is a strategy of strong expansion and diversified development. Conservative strategy (maxi-mini) is based on the large internal potential but must also attempt to overcome the threats from the outside. Competitive strategy (mini-maxi) is created for areas where strengths outweigh weaknesses, and the layout of external conditions is favourable. Defensive strategy (mini-mini) is created for areas where there are fewer developmental opportunities than in areas belonging to other strategies. These areas exist in less favourable surroundings and their potential for growth is weaker. This strategy is mainly to provide them such a position that is currently in the country and minimize risks and weaknesses occurring within the area. For other areas that do not have clear strengths and weaknesses mix strategy is created (so-called mixed strategy).

As a result of AHP procedure we get assignment of a given spatial unit to one of five kinds of strategies.



The arrows indicate changes of strategies which could be observed during a year. According to this graph many regions are very active aiming at higher level of socio-economic development. The formal evidence is the direction of the arrows that is up and right.

Analyzing spatial units on LAU level 1 we can notice some differences in comparison to analogous figure concerning NUTS level 2, namely not all units on LAU level 1 evolve towards better socio-economic situation.

Spatial models (spatial error models, spatial delay models), allow for tracking demand and supply shocks both in time and space.

Taking into account the location and neighbourhood one can evaluate quite precisely and comprehensively the position of the surveyed territorial unit as compared to others – whether, e.g. it is an island among completely other ones, or a part of a greater territorial structure.

Conclusion

There are some important steps which should be taken to create the coherent research system for transborder areas. The first one is determination of the specificity, and creation of a typology of border crossings. In order to create an effective typology we have to take into account specification of the factors that determine the intensity of border traffic (e.g. type of road which leads to the crossing, the number of lanes, border crossing infrastructure, size of towns near the borders) and use of equipment for automatic traffic measurement (co-operation with the General Directorate for National Roads and Motorways, government and self-government authorities, technical universities).

Another essential factor is the determination of the specificity and creation of a typology of border areas. This process should take into account specification of the most important endogenous and exogenous factors affecting the economy and regional development (entrepreneurship, labour market, border trade, exchange rates, price levels, environmental protection, living conditions, migration, tourism, etc.). The clustering of border areas in terms of similarity is very useful in analysis of transborder areas.

Inventory of information resources of official statistics is another important element. It may happen that we have unknowingly a lot of information concerning transborder areas. Sometimes only a deep insight into statistical databases or a little modification in statistical forms is required so as to adapt survey to our needs.

We have to bear in mind that employing extra-statistical sources of information can be fruitful, that is using mobile telephone operators, data on

passenger air traffic, rail traffic, travel agencies, regional offices - permits to work issued for foreigners, employment agencies assisting in employment of citizens abroad by foreign employers and foreign administrative sources such as Workers Registration Scheme in the UK, Social Insurance System (e.g. Personal Public Service in Ireland).

The next interesting path to follow is combining information from the registers and sample surveys especially in terms of budget constraints.

While analysing social-economic processes in transborder areas, the taxonomic measures of development play a valuable role, in particular, spatial models. They allow, among other things, for detecting whether there was diffusion, exchange or interaction – whether other regions become infected or whether local changes are a response to exogenous shocks. The results of such modelling can be disseminated on the local, regional, national and international levels (micro-mezo-macro-inter), and can be useful not only for analysts but also for policy-makers and decision-makers in business.

What is crucial in creation of a coherent research system is determination of the areas of research and, of course, conducting joint research what in general means creating a uniform information infrastructure, in other words creating knowledge base on transborder areas (individual data, micro-aggregates, aggregates, macro-aggregates, meta-information, para-information) and methodological reports.

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