

A SYSTEM APPROACH TO QUANTIFY DEVELOPMENT OF MODERN TRANSBORDER PROCESSES

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ABSTRACT

The presentation examines system-methodological issues of quantitative (primarily statistical) and qualitative analysis of the phenomenon of modern transborder processes, in particular at the new EU's Eastern border. The paper substantiates the necessity of introducing to the scientific circulation the notion of "transborder system" and via it to identify the main components in the number of transborder phenomena. The basic techniques for expert qualitative and quantitative assessment of those components that have been included by the authors of the system for indexation and monitoring of transborder processes are presented. The value of the system statistical toolkit in the process of empirical sociological research of the borders and transborder phenomena is also analysed.

Key words: qualitative and quantitative methods for assessing social phenomena, transborder processes, transborder system, indexation and monitoring, empirical sociological research, transborder statistics.

1. Introduction

As known, human activity as a social being in temporal and spatial dimensions is regulated. This regulation is natural or social. The phenomenon of the border is one of the most significant *social regulators of spatial human activity*. Introduction of the institute of the border that is *real or imaginary lines on the earth's surface, defining the boundaries of the land and water area of the state (state territory)*, was a radical intrusion of man to the natural world organization, in particular *to its spatial characteristics*. The border, by setting artificial interstate distinctions, "broke" the space politically.

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The border is a static phenomenon. Transborder⁴ processes (flows⁵) are a dynamic form of border existence. *Transborder processes (TP) are subjective and natural interactions that take place across the border.* Transborder processes exist since boundaries exist. They can be limited by various parts of the spaces (in particular territories) of states, or can stretch over all their depth.

Given the radical technological, social and political changes that have taken place in the modern world, communication across borders transformed significantly. It became much bigger, more dynamic and pragmatic. As a result, the phenomena associated with the border, have a growing impact on the livelihoods of people (Ustych, 2015).

Therefore, the problem of borders now and before has raised a significant cognitive interest in the society. The scientific community advanced a lot in analysing these or other aspects of border and related phenomena (Kolossov, 2005, Brunet-Jailly, 2005). In short, in studying the social life transborder phenomena there are significant factual, conceptual and organizational achievements.

However, any knowledge is limited by time. Its scope and quality largely depends on the cognitive means used to obtain it. The more advanced, more efficient means, the more diverse and deeper, or, in other words, the richer the knowledge is. This fully applies to the theoretical reflection of transborder processes.

Today, on the author's opinion, there remain *a number of important issues affecting the very essence of modern border and transborder processes that are still unsolved.* These are not scholastic questions. Answers would allow avoiding confusion and errors in theoretical research, and hence the confusion in practice.

One of these very important concerning theoretical and practical point of view issues is the problem of quantitative and qualitative evaluation of transborder processes. It is known that even the outstanding scientist D. Mendeleev emphasized that *science begins since one is starting to measure.*

In the second half of last century the concept of social indicators has been started to use extensively for the study of social phenomena. In the work of C. Weiss can be found information on social indicators. This was due to the strengthening of pragmatic principles of the social sciences, with a focus in their practice on solving urgent problems of social development.

The concept of a synthetic indicator is used to measure the particularly complex, multifactorial objects. This concept (it is also called the rating) often expresses the quantitative and qualitative characteristics of the phenomenon. Today, the definitions of synthetic indicators of various aspects of social life are

⁴ «Transborder (transfrontier)» (Eng.) means “across the border, on the other side of the border”.

⁵ The term “transborder flows” is commonly used in international official documents, including the European Union, and the research literature as a synonym of “transborder processes”.

booming. It is difficult to imagine, for instance, the international relations or investment activity without using these universally acknowledged estimates.

According to the author, in order to solve this crucial problem, *one should be guided by the methodology of system study of society (system methodology), that is a set of methods, techniques or operations aimed at a systemic theoretical and practical acquisition of social reality.*

This choice is conditioned by two main factors. Firstly, this methodology allows us to identify the main component range of transborder processes, without which it is impossible correctly explore the transborder phenomena. Secondly, depending on the nature of transborder phenomenon, it provides the researcher with a particular effective toolkit for quantitative and qualitative analysis.

The author finds it necessary to identify the system nature of transborder phenomena by using a specific term – “transborder system of society”. This concept can be defined as the self-organized set of components of objective and subjective origin that interact with each other in connection with special spatial separations (the borders) outlined by the states.

A horizontal slice of transborder system is the main component row, which includes transborder needs and interests, the subjects of transborder activity, in particular this activity and its objects and tools, as well as the transborder relations.



Figure 1. The components of transborder processes and their interrelation

Source: Own work.

A vertical slice of TB system has formed by its major subsystems: the techno-industrial, economic, political, and spiritually specialized.

According to the size of transborder processes, the transboundary systems can also act on four levels: micro- (local), meso- (regional), macro- (national) and inter- (transnational, glob).

Hence, integral and correlative measurements have become an integral part of any social control, a powerful factor in increasing its efficiency.

Management of such a complex object as transborder flows are no exception. The index of transborder flows is a synthetic indicator, a concept that characterizes the relative importance, place and weight of transborder flows and the level of their development in different spatial segments.

The algorithm for analysis of indices of transborder flows:

1. Conduct a system research based on the methodology of transborder flows.
2. Identify indices (general, special, individual).

3. Their quantitative and qualitative evaluations.
4. Formulation of theoretical and practical conclusions.

On the basis of this algorithm has been developed the System for indexation and monitoring (SIM) of transborder cooperation.

A. System for indexation and monitoring of TBC (SIM) – is a set of theoretical activities that ensure *correct analysis and comparison of common and distinctive features and development trends of cross-border cooperation (CBC) aimed at improvement of its performance, primarily by optimizing management.*

The SIM is based on the developed by the Institute for transfrontier cooperation

(Uzhgorod, Ukraine) system of indexation and monitoring of transborder cooperation in Europe (MIS) which is *a universal model for analysis and optimization of cross-border cooperation* both at the new Eastern border of the

European Union as a whole and in certain other its individual segments, in particular. This system was presented and discussed at the International scientific conference "The effectiveness of cross-border cooperation through international monitoring and coordination of national entities", held in the framework of the project "Borders for people" of the ENPI CBC Program Hungary-Slovakia-Romania-Ukraine 2007-2013 (Uzhgorod, April 8-9, 2011).

Having considered comments and suggestions made by experts the SIM was fine-tuned and approved by the project partners.

The set of indices which is used, as well as their quality and quantity indicators, maximally considers methodological approaches approved by the European Union institutions (in particular, of General Directorate on Regional Policy) and which are used by them in project design at the new Eastern border, and in ENPI Program development in the first place.

However, the SIM is not limited by only this set of information. For the first time, it provides for the *synthetic analysis* of quality and quantity sides of transfrontier cooperation development, allowing by this to obtain *maximally full and adequate information* about this phenomena.

Having got this information, management subjects at various levels are able to develop and adopt *most efficient* political decisions.

The proposed *set of evaluation criteria* (e.g., statistical evaluations) in the medium and long-term monitoring studies may be somewhat modified. But to *ensure the accuracy of comparative analysis* of the level of transborder cooperation its key criteria in all cases of practical application *should be uniform.*

The chronological frameworks for the *starting* study of this or that index are identified by experts depending on the characteristics of the latter.

B. Definition of basic notions

- The **object** of indexation is transborder cooperation of neighbouring regions of Hungary, Slovakia, Romania, and Ukraine.
- **Indexation of TFC** is a tool of political analysis of transfrontier cooperation based on index construction method.

Indexation and conducted on its basis the monitoring of transborder cooperation are information base and guarantee for a significant improvement in activity coordination of national entities of TBC both in different spheres (political, economic, humanitarian, informational) and different levels (macro-, mezzo-, and micro).

For example, in political and administrative area at the macro level – the level of interstate relations – it can significantly increase the effectiveness of existing coordinating bodies, such as Interstate commissions on CBC).

- **Index (from Latin indico – I indicate) of TBC** is an indicator (relative value, expressed in unit fractions or percent) that *quantitatively characterizes dynamics of transborder cooperation as well as serves for its comparison in various regions of Europe.*
- **General index of TBC** – indicator of the level of *object development in general.*
- **Special index of TBC** – indicator of level of development of *one or another group of characteristics (parameters) of an object.*
- **Single index of TBC** – indicator of *level of development of specific (individual) characteristics of an object.*
- **Relevance of index** – *importance of index, its share in sets of other, sequent indexes.* The necessity to consider the relevance of particular index arises due to the fact that sequent indexes play in transborder cooperation development *unequal system forming role.* This should be reflected in its assessment by establishing *the difference in the number of points,* which measure particular index.

C. Index construction

- **General index** “Level of transborder cooperation development between neighbouring regions of Hungary, Slovakia, Romania and Ukraine” is constructed on the basis of special indices by way of their composition and calculation of average index. It is defined on a scale of 1 to 10.
- **Special indexes** are based on single indices by way of their composition and calculation of average parameter. It is defined on a point scale. In relation to general index the special indices are regarded as sub-indices.

Special indexes of general index are the following:

- *Geographic and demographic environment,*
 - *historic, political and spiritual factors,*
 - *legal basis,*
 - *conflict-causing factors - risks and challenges,*
 - *infrastructural characteristics,*
 - *contacts between people,*
 - *economic cooperation,*
 - *integrated borders management and its safety,*
 - *improvement of environment quality.*
- **Single indices** are constructed on the basis of quantity and quality measurements (assessments) of specific object features. It is assessed on a point scale. Single indices are sub-indices in relation to general and special indices.

Single indices are concretized by minimal amounts – **indicators**.

It should be noted that the kind of expertise of the project was its presentation at the European Forum on CBC, which is co-organized by the Institute for transborder cooperation. The first such Forum attended by the Vice-President of the European

Commission held in October 2010 in Uzhgorod (Ukraine) and Kosice (Slovakia), the second - in November 2011 in Kaliningrad (Russia) and Elbląg (Poland).

Results of the project will be also presented at the third European Forum that will be held in November 2012 in Chisinau.

Also pleased that the project was highly positively assessed by the Result oriented Monitoring Committee of the Programme ENPI. In addition, the project was submitted to the contest, held in 2011, by one of the most prestigious European institutions in the field of cross-border cooperation - Association of European Border Regions. According to the results of the contest the Institute received an award "for outstanding achievements in European cross-border cooperation."

So, created during the project "Borders for people" package of methodology and techniques on indexation and monitoring of TBC can be regarded as an original innovative product.

In the context of the issues raised above, the following should be noted. In order to obtain quantitative information about the parameters of social processes associated with the crossing of borders (or, in other words, transborder processes), we turn to statistics, in particular the part known as "transborder statistics." During

the project "Borders for people" has been acutely faced the problem of providing statistical quality index studies of transborder processes. Became apparent the lack of statistical information on certain transborder phenomena, its lack of credibility and serious differences in methodology and statistical evaluation methods that are used to one hand, by the statistical agencies of countries-members of European Union, on the other by the states-participants of Eastern Partnership.

Therefore, the Institute for transborder cooperation with its partners were launched a separate international project devoted to the problems of transborder statistics. It is called "Better knowledge – better cooperation." The project was conducted under the grant program from Visegrad Fund.

Overall objective: Optimization of transborder statistics of neighbouring regions of Poland, Slovakia, Hungary, Romania with Ukraine and Moldova.

Specific objectives:

- 1) Mutual development of methodology for quantity estimation of transborder processes.
- 2) Conduction of joint statistic research for the level of transborder cooperation development in border areas.
- 3) Joint development of training package for introduce in higher educational institutions of border regions.

Period: September 2012 – January 2014.

Institute for transborder cooperation acted as the project applicant.

Partners:

- Institute for Stability and Development (Prague, Czech Republic),
- Centre for Statistical Research and Education, Statistical Office of Poland, (Warsaw, Poland),
- Public Consultancy Center - Association EuroInform (Chisinau, Moldova),
- Association of Regional Development "KIUT" (Zahony, Hungary),
- Statistical office of the Slovak Republic-regional office in Presov (Presov, Slovak Republic)⁶.

Another important feature is the team that implemented the project. The team integrated efforts of experts representing, on the one hand, the community of statistical information producers (professional statisticians), and on the other hand – the community of users (sociologists, economists, lawyers, public

⁶ To project implementation a powerful team of scientists and practitioners was engaged. It was composed of, in particular, known in Europe and around the world experts - in the past head of the Polish Statistical Office, now – Professor of Lazar University in Warsaw Dr. J. Olenski and former director of the Research Institute of Rosstat, vice president of the Russian Academy of Economics Professor V. Symchera.

administrators). This symbiosis turned out to be very productive as it enabled to combine in a single experimental and applied complex both justified requests for cross-border information and quality answers for them.

The findings of the project participants received wide recognition already today. A very important and prestigious was invitation to participate in the 59th World Statistical Congress held on August 25-30, 2013 in Hong Kong (PRC). It brought together more than 2400 participants from all continents, representatives of governments, international organizations, researchers and practitioners. According to the program, a special session was held on the topic relevant for all regions of the world - on transborder statistical processes (transborder statistics).

In particular, presentations were made by the Institute for transborder cooperation experts Vasyl Symchera, Serhii Ustych, Marek Cierpial-Wolan, Joseph Olenski. Presentations arouse much interest from the forum participants and generated lively discussions. A general conclusion was made that the problems of transborder statistics are very important for all regions of the world, and the project "Better knowledge - better cooperation" enabled the first successful steps towards the formation of a new chapter in statistical research and practice. Participants unanimously concluded that this work should be continued on a wider scope, followed by a presentation of the findings at the World Statistical Congress in Rio de Janeiro (Brazil) in 2015.

The meeting was attended by representatives of national delegations, Eurostat (the EU body of statistics), the World Bank and others.

Institute for transborder cooperation also presented and distributed among the Congress members the collection of scientific findings "Materials on transborder processes statistics" (in electronic format, in English), edited by V.Symchera, Y.Olensky and S. Ustych.

Based on the presentations made at the Congress, a collective work "Optimization of transborder statistics" in Ukrainian and English languages was published [Optimization, 2014].

In accordance with this understanding three types of transborder statistics are proposed to be identified, corresponding to macro-, meso- and micro- levels of transborder processes. *The national transborder statistics* quantifies the subject, institutional and object interaction across the border at the state level, *regional transborder statistics* - at the regional level, *local transborder statistics* - at the local level.

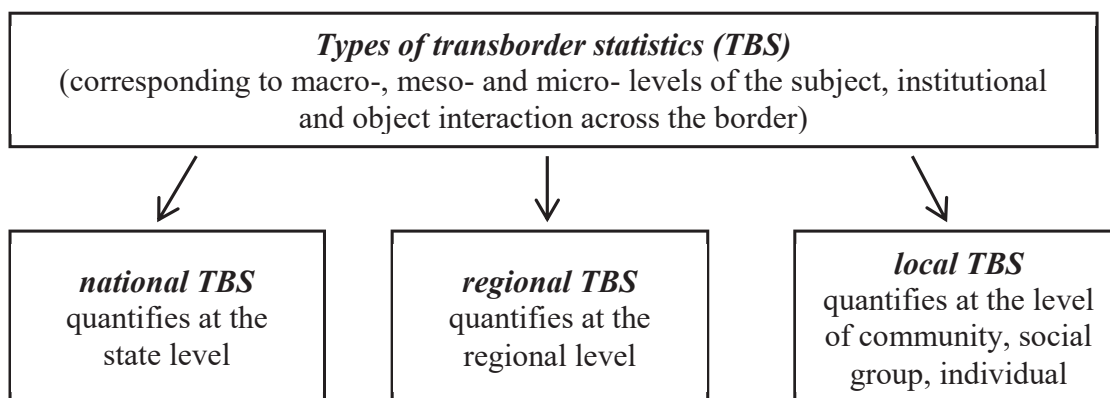


Figure 2. Types of transborder statistics

Source: Own work.

Interdisciplinary product that reflects the quantitative aspects of transborder processes and can be called "transborder statistics", of course, requires its identification.

It is known that the term "statistics" is of Latin origin from the word «status» - state, state of affairs, the state. In the study and management of social phenomena this term refers to: 1) a separate social science; 2) some kind of social development as to the specific conditions of time and place; 3) a form of social activity; 4) a training course; 5) the collection of data about the phenomenon or process.

Based on this conventional understanding of statistics, the authors proposed to identify the term "transborder statistics" as:

- statistics section, designed to investigate the quantitative patterns of transborder phenomena and processes and give them a numerical reflection in close connection with their quality characteristics;
- side of the objective development of social phenomena and processes associated with the crossing of the border;
- type of statistical activities aimed at obtaining, processing and analysis of information that fully describes the quantitative patterns of transborder phenomena and processes;
- statistical discipline that foresees the study of methods for transborder statistics, primarily statistical techniques of observation, initial processing of the collected data, the method of groupings, rules for constructing statistical layouts, calculating general indicators (relative, middle, index), analysis of the relationship between indicators of transborder statistics;
- collection of quantitative data on transborder phenomena or process.

Overall, the project implementation demonstrated the following:

- 1) The statistical reflection of modern transborder processes should "keep up" with their highly dynamic development; constantly enrich it with innovative methods.
- 2) An effective transforming and cognitive means of transborder processes is transborder statistics that can significantly clarify and specify categorical knowledge about the nature of transborder phenomena and their structure.
- 3) One of the significant advantages of transborder statistics is its practical orientation. This is evidenced by findings of international projects devoted to the modern transborder processes analysis and management.
- 4) The theoretical and practical constitution of transborder statistics made its first steps. Major efforts by researchers and practitioners, particularly in the field of improving methods of quantitative assessment of transborder phenomena and processes, effective social implementing of information received are still to be done.

2. Conclusions

To sum up, the following conclusions can evidently be made:

- 1) System methodology provides the necessary theoretical prerequisites for effective use of modern tools for quantitative and qualitative analysis of transborder processes.
- 2) The ratio of quantitative and qualitative methods for evaluation of any transborder phenomenon depends on its nature.
- 3) One of the greatest advantages of the system research methodology is its practical orientation. This is proved by the findings of the international project, dealing with modern transborder processes' analysis and management.

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