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METHODOLOGICAL ASPECTS OF THE TYPOLOGY OF REGIONS AND TERRITORIAL FORMATIONS

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A b s t r a c t

This paper presents the typology of regions in developed countries. It includes illustrated scientific concepts of describing development of regional territorial systems based on local cores used as the basis for the typology. The article identifies typologies, highlighting reasons behind the attractiveness of individual regions for capital and labour; as well as links among economic operators. Typology methods for European regions are discussed, including typologies associated with transport accessibility, economic specialisation and the functional structure of regions. In most typologies, the basic developmental factors and solutions to practical issues are taken into account. A special role is played by typologies that are associated with economic growth and those that take into consideration a GDP per capita increase; along with the population density factor. Attention is drawn to the use of research on the typology of regions with regards to developmental planning, modelling and strategizing.

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ASPEKTY METODOLOGICZNE TYPOLOGII REGIONÓW I JEDNOSTEK TERYTORIALNYCH

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S ł o w a k l u c z o w e: typologia regionów, jednostki terytorialne, NUTS.

A b s t r a k t

W opracowaniu omówiono aspekty metodologiczne w typologii regionów i jednostek terytorialnych. Przedstawiono najważniejsze naukowe podejścia do rozwoju regionalnych systemów terytorialnych na podstawie modeli i metod, które są typowe dla terytoriów o różnych poziomach taksonomicznych i stanowiły podstawę typologii. Wskazano typologie, w których określono przyczyny atrakcyjności określonych regionów dla kapitału i siły roboczej, powiązania między podmiotami gospodarczymi. Omówiono sposoby typologii regionów w UE. Są to typologie związane z dostępnością transportową, specjalizacją ekonomiczną i strukturą funkcjonalną regionów. Większość typologii uwzględnia podstawowe czynniki rozwoju i przystosowane do potrzeb rozwiązywania zagadnień praktycznych. Szczególną rolę odgrywają typologie związane ze wzrostem gospodarczym i uwzględniające wzrost PKB na jednego mieszkańca oraz współczynnik gęstości zaludnienia. Zwraca się uwagę na wykorzystanie badań nad typologią regionów w planowaniu, modelowaniu i strategii ich rozwoju.

Methodological Aspects of Typology

In methodology[1], great importance is given to the typology, classification, and taxonomy of research objects. In the second half of the 20th century, research on territorial typology in developed countries was very popular. So many methods and proposals of scientific typologies emerged that it seems impossible to analyse and assess them in detail in this article. In this paper, only the most famous and interesting studies are discussed (Bilczak *et al.*, 2016, 2020).

In the 1960s, J. Friedmann studied the interdependencies between the centre and the outskirts. Papers on that topic had been published long before, to name a few authors: F. Perroux, D. Beaudeville, J. R. Lasuén, P. Pottier and

[1] Methodology is a system of principles and ways of organizing and constructing theoretical and practical activities.

others. Based on all of that research, J. Friedmann singled out four stages of the development of a country (Friedmann, 1966).

In the first stage, a territory is a system of local centres with each of those centres having its own sphere of influence. In the second stage, one of the centres will develop in a more advantageous and dynamic manner, which polarizes and forms the region; thereby, transforming it into the main centre of the country surrounded by vast peripheral regions. In the third stage, in certain peripheral regions, regional centres tend to grow faster and transform into new production zones, as a result of which a monocentric territorial structure shifts to become a polycentric construct. The fourth stage is defined as the inter-metropolitan stage. It is the most dynamic component of the structure. As a consequence of the intensification of land use combined with the dispersion of centres, vast urban constructs with active and dense economic activity emerge (Münter & Volgmann, 2020).

Even though Friedmann's typology at the outset related to the territory of a country, it later turned out that the model in question also applies to territories at various taxonomic levels. As a result, the concept of a "core-periphery" served as the basis for the typology of economic regions. In this typology, the following are singled out: core regions, upward transitional regions, resource frontier regions and downward transitional regions.

Another typology is the typology proposed by A. Markusen who studied the basis of attractiveness of regions for capital and labour in an industrial region (Markusen, 1996). According to A. Markusen, an industrial district is a large, spatially limited territory specialised in the exploitation of resources, the production of products, the provision of services, and is especially orientated in trading the above-mentioned commodities. Markusen singled out four types of industrial regions. The first of them was a Marshallian industrial district. Its name comes from the name of A. Marshall, a famous researcher. In his time, Marshall wrote that an industrial district is an area inhabited by a population working at small and medium-sized companies, in a special industrial sector or was linked to it in some way. In accordance with the foregoing, Italian industrial districts were created which were referred to as districts (Marshall, 1920).

Within an industrial district, close and permanent links between purchasers and sellers are formed and long-term contracts are concluded. Employees can change the company where they work and, together with the business owners, they identify themselves with a specific region or zone more than with a specific company. As practice shows, such a form of growth exerts a positive influence on the competitiveness of the region where a given district is located.

The second type of industrial district is the "hub-and-spoke" region. Here, employees identify themselves primarily with large companies, then with regions, and only later with smaller companies. It is completely understandable that in the face of vacancies in large companies, employees will choose to leave a small

company and go to a large company. All of that leads to market imbalances and adversely affects the competitiveness of the region.

In districts of the second type, large companies are actively involved in activities related to the development of educational institutions and medical establishments as well as to infrastructure improvement which, in turn, increases the competitiveness of the region. At the same time, there is a risk that the "hub-and-spoke" industrial regions may completely rely on the development of the primary industry. If the strategy for the development of this industry fails, it will result in a catastrophic situation in regions of this type.

The third type of industrial district consists of industrial platforms constituting a group of medium and large-sized non-interrelated assembly plants of foreign international concerns. In regions resembling industrial platforms, of key importance are large companies located outside the region, which make important investment decisions. Of all types of industrial regions, it is the most attractive one. It is only when industrial platforms emerge in problematic and neglected regions that population incomes increase, new jobs are created and the competitiveness of the region grows. This region type is most advantageous for highly qualified employees, blue collar workers specialised in engineering and mechanical systems, as well as for white collar workers of various categories.

The fourth type of district is the state-oriented region where a state-owned company is located in the centre and independent vendors and subcontractors are dispersed around it. The key role is played here by state-owned companies and institutions which ensure the transfer of technology, funds and infrastructure. These are customer-to-service providers who purchase local products, and who control the migration of labour. In developed countries, this type of region is characteristic of the arms industry.

In the scientific literature concerning the subject, the classification and typology of American counties is often presented. The point is that this typology differs from the typology of other territorial entities and is of scientific interest. All counties, depending on their economic specialisations, are divided into the following types: agrarian, mining, and industrial counties; counties dependent on state spending; service counties; and counties without a clearly defined specialisation. An advantage of the said method is that due to different prioritisation, the typology of US counties is not only of a scientific character, but it also provides for an analysis of the main growth drivers of specific territories. In addition, from a methodological perspective, the typology of US counties has the advantage of being performed on the basis of various scientific approaches and statistical data.

Typology of Regions within the European Union

Researchers have become interested in different ways of classifying regions in the European Union. At the end of the 1990s, great attention was paid to the development of peripheral regions. In order to improve the development of peripheral regions, an availability factor has been developed, which is characterised by such indicators as travel expenses, daily availability, and potential availability. The daily availability factor is the time in which one can get from the place of departure to the place of destination. For instance, a single business trip to a place of destination takes three to five hours. The potential availability factor assumes that there are differences in the attractiveness of a given place. The basis assumed is an inexpensive trip which takes little time. An example might be a trip to large shopping centres and hubs.

In particular, it must be emphasised that an availability factor value is always defined by the peripheral character, both in geographical and economic terms. On that basis, all peripheral regions were identified, although the method in question was used to develop an EU transport policy. Of the greatest popularity in the EU is a typology based on the economic specialisation and functional structure classified under NUTS 1, NUTS 2, and NUTS 3. However, one should remember that Eurostat data and its methodology of statistical calculations, as well as NUTS classification, are used in science. The NUTS classification serves to form regional policies of European Union countries and is used to carry out analysis of the level of socio-economic development of regions. In our study the development of NUTS territorial units and the changes that have been introduced since 2018 were used. All of the EU Member States were divided under NUTS in 2013 into 1,716 NUTS units: 98 NUTS 1 units, 276 NUTS 2 units and 1,342 NUTS 3 units. Once that division was approved, the typology of territorial units used for statistical purposes in 2003 was reviewed and the number of NUTS units was increased by 340. These include first and foremost the NUTS units of new EU Member States (Tab. 1).

NUTS was used for the first time by M. Heidenreich in 1997 (Heidenreich, 1998). 202 EU regions were selected as units of classification and five indicators that best reflected the social and economic specialisation and situation of the regions were adopted as criteria. The classification took into account the following:

– unemployment rate;
– share of people employed in the working age population;
– income per capita;
– share of residents employed in industry;
– share of residents employed in services.

Table 1

NUTS Territorial Units in EU Member States

Country	NUTS 2003 (11.07.2003–31.12.2007)			NUTS 2006 (01.01.2008–31.12.2011)			NUTS 2010 (01.01.2012–31.12.2014)			NUTS 2013 (01.01.2015–31.12.2017)			NUTS 2016 (01.01.2018–currently)		
	NUTS Level														
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Austria	3	9	35	3	9	35	3	9	35	3	9	35	3	9	35
Belgium	3	11	43	3	11	44	3	11	44	3	11	44	3	11	44
Bulgaria	-	-	-	2	6	28	2	6	28	2	6	28	2	6	28
Croatia	-	-	-	-	-	-	-	-	-	1	2	21	1	2	21
Cyprus	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Czech Republic	1	8	14	1	8	14	1	8	14	1	8	14	1	8	14
Denmark	1	1	15	1	5	11	1	5	11	1	5	11	1	5	11
Estonia	1	1	5	1	1	5	1	1	5	1	1	5	1	1	5
Finland	2	5	20	2	5	20	2	5	19	2	5	19	2	5	19
France	9	26	100	9	26	100	9	26	100	9	27	101	14	27	101
Greece	4	13	51	4	13	51	4	13	51	4	13	52	4	13	52
Spain	7	19	52	7	19	59	7	19	59	7	19	59	7	19	59
The Netherlands	4	12	40	4	12	40	4	12	40	4	12	40	4	12	40
Ireland	1	2	8	1	2	8	1	2	8	1	2	8	1	3	8
Lithuania	1	1	10	1	1	10	1	1	10	1	1	10	1	2	10
Luxembourg	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Latvia	1	1	6	1	1	6	1	1	6	1	1	6	1	1	6
Malta	1	1	2	1	1	2	1	1	2	1	1	2	1	1	2
Germany	16	41	439	16	39	429	16	38	412	16	38	402	16	38	401
Poland	6	16	45	6	16	66	6	16	66	6	16	72	7	17	73
Portugal	3	7	30	3	7	30	3	7	30	3	7	25	3	7	25
Romania	-	-	-	4	8	42	4	8	42	4	8	42	4	8	42
Slovakia	1	4	8	1	4	8	1	4	8	1	4	8	1	4	8
Slovenia	1	1	12	1	2	12	1	2	12	1	2	12	1	2	12
Sweden	1	8	21	3	8	21	3	8	21	3	8	21	3	8	21
Hungary	3	7	20	3	7	20	3	7	20	3	7	20	3	8	20
United Kingdom*	12	37	133	12	37	133	12	37	139	12	40	173	12	41	179
Italy	5	21	103	5	21	107	5	21	110	5	21	110	5	21	110
TOTAL	89	254	1,214	97	271	1,303	97	270	1,294	98	276	1,342	104	281	1,348

* The United Kingdom's membership in the EU, which had lasted since 1973, was terminated at midnight from January 31 to February 1, 2020.

Source: based on data from Główny Urząd Statystyczny (2020).

Based on a cluster analysis of the said indicators, the regions were subdivided into eight types:

– type 1 – metropolitan regions with a highly developed sphere of services comprising the largest cities of the European Union;

– type 2 – semi-peripheral administrative regions and regions specialised in services;

– type 3 – poor regions specialised in services. Those are only the regions of Spain and Italy;

– type 4 – regions – industrial centres (cores);

– type 5 – industrial semi-periphery;

– type 6 – industrial periphery;

– type 7 – emergency industrial regions;

– type 8 – agricultural mediterranean regions.

An advantage of the aforementioned classification is the fact that, first of all, it is relatively easy and convenient for analysing various factors in each type of region and, second of all, it defines a clear framework for comparative research on the specifics and features of each type of region, e.g. regions – industrial centres.

It is noteworthy that in the EU, this method is universally applied to institutional management and policies. It is continuously improved through changes. NUTS was last changed in 2016, the changes concerned eight EU Member States and applied to all of the three levels. For instance, France changed the boundaries of territorial units under NUTS 1 from 9 to 14, and Finland changed the boundaries of territorial units under NUTS 3. Likewise, the Netherlands changed the boundaries of seven territorial units under NUTS 3. Ireland and Lithuania changed the number of units under NUTS 2. In those countries, as well as in Hungary, separate units related to administrative boundaries of capital cities were singled out as separate structures. In addition, similar changes occurred in Hungary under NUTS 2. The greatest changes occurred in the UK under NUTS 2. An additional unit was established in Scotland. In addition, the number of territorial units under NUTS 3 increased from 173 to 179. In Germany, there were changes in the boundaries of two units under NUTS 3 with the remaining two units merging together.

The typology singling out eight types of regions is of great significance and will be used in numerous scientific studies. It is a typology where geographical factors are taken into consideration. It may be useful in solving practical tasks. These are the following regions under this typology (Sepik, 2005):

– growing megalopolises – these are cities and urban areas in the heart of Europe, including capital cities, where headquarters of large companies, R&D centres, educational institutions and cultural establishments are located. Such regions are considered to be the richest regions in the EU;

– dynamic urban regions outside the primary zone of economic development of Europe. The demographic and economic potential of such regions fosters R&D

activities and, over time, closer relationships with the most important European and international decision-making centres;

– rural regions located near large cities and integrated with the global economy. They are characterised by economic growth and an increasing population. They are usually in the immediate vicinity of large cities. Employment is mostly concentrated in spheres of industry and services; however, a considerable area of land is used for agricultural purposes;

– intermediate rural regions which are relatively far from larger urban centres, although they are well-connected to them and have highly-developed infrastructure. Predominantly, they are characterised by a stable population at the stage of economic diversification. They are very often home to large agricultural undertakings;

– isolated rural regions. They are characterised by a low density of population and location on the periphery, far from large cities and main transport hubs. Their population is usually ageing, their infrastructure is underdeveloped, the level of basic services and average income per capita are low, and the economy is insufficiently integrated with the global economy. Usually, the population is associated with agriculture to a large extent and is in decline;

– depressed regions characterised by a declining population. Typically, they are characterised by low population income, a high unemployment rate, a high share of people employed in industry and agriculture, a small number of young people and low population density. An exception is certain capital cities characterised by an increase in a population living outside the official city limits;

– regions in an unfavourable area characterised by special geographical conditions that hinder their growth. These include remoteness, insular location and mountains. Their core problem is difficult access to the rest of the EU and issues connected with EU integration. In many cases, a population or the market size is below the critical mass required for investing from an economic perspective. This problem is additionally intensified by an ageing and declining population as young people decide to leave these regions;

– regions undergoing economic transformations. These are primarily poorly developed regions which began the transformation of their economic structure due to their originally low competitiveness. They are characterised as having high unemployment and a low GDP.

In the EU, the typology of regions developed for research on economic growth is currently very popular (*A Study on the Factors of Regional Competitiveness*). This typology defines all regions where there is production, though an analysis is based on two essential factors – population density and the GDP per capita. As a consequence, all the regions were subdivided into three basic types: regions – industrial platforms; regions – sources of income increases; regions – knowledge centres. It appears that production in regions – industrial platforms is cheaper because labour, land and capital are available and cheap there. Such regions are attractive in terms of direct foreign investments, since their attractiveness

is based on location or, in other words, on the concentration of economic activity. Thus, in developed countries, labour, land and capital – but labour in particular – are characterised by a very high price. However, it is different when an analysis is carried out for poorly developed EU Member States or for peripheral regions, but such a conclusion is well-grounded. In the literature on the subject, such regions include Ireland, Central Scotland, Southern Wales, Western Poland and certain parts of the Czech Republic and Hungary.

The second type, "regions – income increase sources", is also characterised by a high rate of increase, average population density and highly developed economic structure. They are so-called "dynamic regions". Such regions are especially rich in specialised sectors. Apart from that, qualified professionals, intra-company division of labour, a developed market and availability of supplies significantly improve the attractiveness of those regions.

The most interesting regions from a practical point of view are regions of the third type – "regions – knowledge centres". They involve an agglomeration economy which is of the utmost importance in the EU. In large agglomerations of Western Europe, virtually the entire scientific and technological policy is implemented there. Furthermore, there is rapidly developing innovative scientific and technological progress. Since such cities have always been centres of knowledge and information, professional promotion and the implementation of important R&D initiatives require the involvement of academics and researchers – making regions of this type attractive for famous and talented scholars and practitioners.

Changes underway in all of these three types of regions cause a given typology – depending on the socio-economic progress and possible crises – to undergo considerable changes, which means that regions may migrate from one group to another. The last crisis (2008) proved that many regions with favourable conditions have lost their attractiveness and, even now, their economic standing has been difficult. Entire countries (Ireland, Southern Europe) have been in a depression for a long time. That is why typologies are temporary and contractual.

There have been significant changes in the typology of regions in the province of North Brabant in the Netherlands where, at the beginning of the 1970s, an acute crisis led to the emergence of the concept of economic transformation of a region through the development of small tech companies. As a consequence, that region became a special centre of technology.

The typology in one of the most developed regions of Germany has been changed considerably as well. In the Ruhr Area (coal mining and steel production), through the restructuring of associations and the collaboration with small specialised companies, it was possible to overcome the crisis and achieve a high level of industrial modernisation (Cohen, 2006). A parallel example can be found in West Yorkshire (Great Britain) where an association of state-owned companies, private companies and other various agencies in the machine industry was established which, as a result, allowed a new type of region to emerge: "region – business & innovation centre" (Poblan, 1996).

Conclusions

Research has shown that the typology of regions has deep roots and traditions. To date, the most complex typology of territorial units – NUTS – has been improved and takes into account contemporary processes of change in regions undergoing globalisation. This solution has been implemented in numerous developed EU Member States. This trend indicates that, depending on socio-economic growth and socio-economic changes, every typology can vary considerably, which means that regions can migrate from one group to another; especially when individual countries have significant problems with socio-economic growth due to recent crises. Therefore, the typologies of those regions are definitely temporary and conditional. Many regions of this type are portraying distinct development. The aim of this examination has been achieved. The typology of regions in developed European countries show compound dynamic processes, with much creativity and individual assessment for every region.

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