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THE NOTION OF ECONOMIC REGION IN THE LIGHT OF HOLISTIC INTERPRETATION

INTRODUCTORY REMARKS

The analysis of contemporary geographical literature makes it possible to conclude that there exist multiple, various concepts of economic region. In the extreme cases differences in understanding the notion of economic region are so great that only verbal similarity of the notion used links to a certain extent respective considerations.

From among many concepts of economic region the greatest viability is displayed by the holistic concept, which treats region as a certain relatively isolated whole, characterized by definite grouping of mutually connected elements.

In the holistic concepts of economic region two competing directions can be distinguished: the mechanistic and the organistic (systemic) one. The systemic concept treats economic region as an organized whole having a dynamic character. Foundations of this concept are related to the idea of holistic nature of living organisms, whose particular components can be determined only through recognition of their place in the whole.

The concept of economic region as an organistic whole has become the basis for many progressive theoretical and methodological concepts in contemporary economic geography. The most important of them include application of quantitative methods in economic geography and formulation of the concept of economic region as an open system of energy production, consumption and flow.

ECONOMIC REGION AS A MECHANISTIC-ADDITIVE WHOLE

The concept of region in geography has at its foundations the question of division of the Earth's surface into bounded wholes, constituting the basis for geographic description, these entities appearing as *sui generis* separate real entities, having definite contents and form, being the basis for their perception, discrimination, description, etc. Thus, the problem of

determination of regional substratum is reduced to definition of ontogenic essence of this whole.

The concept of a region as a "certain whole constisting of the sum of its elements" is as old as geography itself, but it is only its recent development that has made it appear as the question of "region's essence". Modern geography, in the period of its shaping during the 18th and 19th centuries, has endowed the notion of region with the idea of "natural" division, immanent to the very features of the Earth's surface, and, therefore, really "geographic", i.e. corresponding to the interests and character of geography as a science. Such a division would be, in general, not compatible with "artificial" divisions, established by man, in the guise of, e.g. political boundaries.

At the same time, within the domain of social sciences the thesis which then starts to dominate stipulates that economic regions do in reality constitute some unitary objects, "wholes" having definite forms and structures, thereby allowing for both their existence (the ontogenic aspect) and their distinction (the epistemological aspect). It is significant that the concept of economic region as a "certain whole" has acquired citizenship rights in the Marxist as well as in non-Marxist social sciences.

In the Marxist school of thought the first scholar to consider the notion of economic region in terms of categories of a certain whole was V. Lenin (1899). Lenin started explanation of spatial distribution of economic phenomena, and, in particular, the notion of economic region, as the expression of territorial work specialization. The concept of economic region as an objective, really existing whole with internally similar economic structure and definite economic specialization is in principle still being developed in the works of Soviet geographers. This is most completely expressed in the theory of territorial-productive complex formulated by N. N. Kolosovski (1955 p. 100). Productive complex is understood there as such a set of mutually dependent enterprises which yield definite economic effect owing to rational choice of enterprises, according to natural and economic conditions of the area, to its transport-wise and economico-geographic location. Therefore, from the ontogenic point of view the notion of complex does not mean anything else but a setting of mutually conditioned (mutually subordinated), really existing various socio-economic elements, objects and processes.

Non-Marxist geography, on the other hand, assumes that economic region is not a real, objectively existing, entity, but merely a certain convention adopted by the cognizing subject just for the "thinking comfort". The leading representative of this view was A. Hettner (1927), whose attitude to the concepts of "natural", or "real" geographic region, treated as objectively existing entity, was quite critical.

In the Hettner's approach, economic region is a whole consisting of the sum of finite number of elements of a set. This set encompasses

both natural and socio-economic elements. One can notice therefore a certain essential inconsistency in the Hettner's approach. Namely, if a region is a certain whole this whole should display some features that would make it possible to distinguish it from another, different, whole. It is just this "difference" that denotes in the language of ontology a separate real existence. Subjectivistic nature of regions would, on the other hand, mean that their existence is "construed" owing to Kantian aprioric features of the cognizing subject. Thus, the holistic nature of regions, emphasized so much by Hettner, would be not a really existing feature, but rather a subjective one, each time defined by the researcher.

Hettner's concept of economic region as a sum of elements within a specific class is very broadly represented in modern geographic thought. According to a A. K. Philbrick (1957), who created the theory of the so-called functional organization of space, socio-economic life should be considered as the sum of activity of particular agents active in all kinds of plants and institutions. Similar stance was taken by C. D. Harris (1963), for whom economic region is a certain internally compact whole. Even more distinctly, the concept of region as a whole was stressed by H. M. Mayer (1954), who held that in reality each region is composed of many various elements, referred to as simple regions.

In concepts outlined here the economic region is treated as a whole, with its features and regularities resulting exlusively from those of the elements, constituting this whole. Thus, an economic region appears as having mechanistic character, that is, being composed according to the rules following the principles of mechanics of Newton.

The concept of economic region as a mechanistic (additive) whole is therefore, based upon two fundamental notions: the "whole" and the "sum of its elements". In spite of appearances these notions are very vague and ambivalent, and therefore the very essence of region reflects this situation.

Additive theories of economic region use most commonly the notion of "whole" to denote something having definite spatial dimensions and then a "part", or an "element" denotes something that is spatially contained in this whole. The meaning of "part" and "whole" can, though, be understood in two completely opposed manners. First, these terms may apply to specifically spatial features and then a whole is a length, a surface or a volume, containing, as parts, lengths, surfaces and volumes. Secondly, "whole" may refer to non-spatial features and/or to the state of a certain space-occupying thin and "part" then refers to the same feature or state description of a space-occupying part of this thing. The same multiplicity of meanings applies to the notion of "sum". The advocates and proponents of the mechanistic (additive) concept seem not to notice this problem, by declaring that they do apply the notion of "sum' in accordance with its definition from mathematics and formal logic. Even in these contexts,

though, "sum" has many special meanings, depending upon the type of mathematical "objects" being added. Thus, there exists the very well-known addition of natural numbers as well as indentically called, but in fact different, operations on fractional numbers, real numbers, compound numbers, matrices and on other mathematical and logical "objects". It is not quite obvious why all these activities are referred to with the common name of "addition", although there exist at least certain formal analogies among many of them: for instance, most of them are commutative and connective. There are, however, important exceptions from the rule implied by this statement, since, for instance, addition of ordered sets is not always commutative, although it is always connective. Simultaneously, the sum of two objects is in mathematics always another object of the same type as its added elements. Besides, although the term "part" is not always used or defined in connection with mathematical objects, still, when it is used in conjunction with the term "sum" then the proposition "whole is the sum of parts" is just an analytical truth, that is a convention.

It is not difficult, however, to construct a counter-example for the latter statement. Let K be an ordered set of integers, this ordering performed in the following way: first odd integers starting with the smallest ones, then even integers in the same sequence. K_1 can therefore be presented as follows: $1,3,5,\ldots,\ldots.2_2 4,6,\ldots$. Then let K to be the class of odd unordered integers and K the class of even unordered integers. Further, let K be the set theoretical sum of classes K_1 and K_2, so that all integer numbers are elements of K. This new set, K is, of course, also unordered. Thus, all elements of K are also elements of K and, vice versa, although these two sets are by no means identical. It can, therefore, be proposed that in this case the whole (say, K) is not equal to the sum of its parts (say, K).

Considerations here contained are instructive for several reasons: they demonstrate that it is possible to define in a precise manner the terms of "whole", "part" and "sum" in such a way that the proposition "whole does not equal the sum of its parts" not only is not logically absurd, but is logically true. Thus, there are no *a priori* foundations for rejecting such a proposition as being always nonsensical. This opens the way to treatment of region as a whole, which is something more than the sum of its elements. Such is the standpoint of the representatives of systemic concept for economic region.

ECONOMIC REGION, AS A NON-ADDITIVE WHOLE (A SYSTEM)

The starting point for the systemic concept of economic region is constituted by the idea of hierarchical organization of things and processes, giving rise to appearance of certain "qualities" on higher organi-

zation levels, these new qualities not being foreseeable on the basis of qualities observed on lower levels.

A vast majority of systemic concepts of economic regions is founded upon the conviction that region as a certain whole "is something more than sum of parts". Such a conclusion was reached in the 1950s by the Committee of Regional Studies chaired by D. Whittlesey, after an analysis and discussion of the notion of region. According to D. Whittlesey (1954), economic region is an entity created for purposes of thinking along the line of choosing certain features essential for a certain spatial problem or phenomenon, with omission of all the other elements considered inessential. The region is, in accordance with the definition adopted in the reference mentioned, a certain whole within which spatial relations ensure some form of cohesion. It is this, vaguely defined, "form of cohesion" that leads to the fact that region is something more than just a sum of its elements.

Economic region is also defined as a system composed of the set of mutually related elements. These mutual relations mean that among elements denoted p there exist relations R so that behaviour of an element p under relation R_1 is essentially different from its behavior under a different relation, R_2. When behavior under relations R_1 and R_2 is not different, then there is no interaction and in fact elements behave in a certain way irrespective of R_1 and R_2.

Such a concept of system found its most complete expression in the work of B. Rychłowski (1967). In his opinion, every economic region is similar to an organ of a living organism, performing a specific function in this organism. Thus, the organism as a whole determines functions of parts in their development, and, on the other hand, the specific functions performed by parts ensure normal functioning of the organism. No economic region exists by itself, irrespective of a definite system of economic regions. Existence of an individual region is therefore conditioned by existence of the entire system of regions, of which an individual region constitutes a link.

K. Dziewoński does also treat economic region as a system which is in fact a set of cooperating elements. In his theory of economic region, formulated in topological categories, K. Dziewoński (1967b) defines region as a subspace of the general socio-economic space. This definition implies that an economic region, being a part of a greater set, constituted by socio-economic space, is itself a space, that is, a set in which relations among its elements are determined.

In both concepts presented, economic region is in reality constituted by a set of elements and interdependences. Economic region is treated here as a system, i.e. a whole composed of parts which interact. The prototype description of a system would therefore be provided by the set of simultaneous differential, in general case—nonlinear, equations. Eco-

nomic region, i.e. "organized functional complexity" may therefore be defined on the basis of appearance of "strong interactions" or "non-trivial", that is nonlinear interactions.

Functional approach treats economic region as a whole whose essence consists in the fact that it cannot be analyzed from an "additive viewpoint", constituting, as is known, the gist of the mechanistic concept of the whole. Regions as functional wholes are defined as such wholes whose behaviour is not determined by behaviour of their individual constituent parts, but whose processes are at least to a degree determined by the very essence of the whole's nature. The distinguishing feature of such regions is, therefore, the fact that their parts do not act and do not posess features independently of each other. On the contrary, these parts are to be so interconnected that an arbitrary change in one of them would entail a change in all the other parts. In reference to that it is also said that these wholes are of such a nature that they cannot be built out of individual elements by simple linkage of the latter in a certain sequence, entailing thereby no changes.

It is beyond doubt that in many actual economic regions their parts and component processes are certainly "internally" interconnected in the sense that there exist among these parts and processes connections in terms of mutual causal dependences. Some theoreticians of the systemic approach, however, tend to maintain that it is difficult to make a clear distinction between the wholes of this type and the wholes appearing as different in nature, and that therefore any real whole should be considered as, in a way, "functional".

One can, therefore, conclude that although existence of economic regions having characteristic structure based upon mutual interconnections of parts is not subject to doubts, there is no general criterion that would allow making of absolutely justified decisions as to which regions are "truly functional" and which are merely "additive".

It is, besides, essential to distinguish the question "whether a given socio-economic whole can be constructed by sequential joining of new parts" from the question "can this whole be analyzed by application of a theory concerning its parts and their mutual relations"? Undoubtedly, in case of some real wholes the answer to the first question is positive and then such a region is analogous to, for instance, solar system. There exist, however, also regions for which the answer to this question is negative and then such regions are analogous to a say, clockwork mechanism. But these differences between various settings of parts do not, in fact, correspond to a significant differentiation of functional and additive (summative) wholes. Therefore, the fact that certain wholes cannot be effectively constructed out of their component parts cannot be considered a justification for negative answer to the second of the questions quoted,

since, for instance, such an impossibility of construction may result from temporal constraint set by technological limitations.

Still, the second question is certainly more essential, since it approaches the problem that seems to be the fundamental one in this context. The problem boils down to the question whether analysis of a region as a "functional whole" does of necessity require application of irreducible laws concerning this whole and whether its structure rules out the possibility of analyzing them from the so-called additive viewpoint. The main difficulty lies here in proper indication as to what distinguishes the "additive" analysis from other types of analyses. Such a distinction seems to be based upon the hypothesis that parts of a functional whole do not behave independently of each other, so that it cannot be assumed that laws applying to these parts as separate entities remain valid when these parts constitute together a functional whole. It seems, therefore, that "additive" analysis is the one which explains features of a region on the basis of statements concerning its constituent parts as elements of a whole. On the other hand, the non-additive analysis, it seems, describes the features of a region on the basis of statements concerning relations among parts as functional elements of a whole.

If, however, only such differences do distinguish these two types of analysis, said to differ significantly, they may be treated as inessential. It has already been said, that it is difficult to strictly distinguish the boundary between these regions which are usually referred to as "functional wholes" and other types of regions. In connection with that, if even parts of additive wholes remain in mutual causal relations, an additive analysis of such wholes must contain special assumptions as to organization of the parts of these wholes, in order to be able to apply some fundamental theory.

ECONOMIC REGION AS AN OPEN ENERGY SYSTEM

Interpretation of economic region in the categories of general systems theory, i.e. as a whole composed of elements remaining in mutual relations implies, first of all, determination of ontological nature of the very whole.

From the point of view of the systems theory of L. von Bertalanffy (1968), one can distinguish among the systems really existing two types of systems: closed and open (dynamic). According to this concept, economic regions analogous to non-additive (functional) wholes should be included in the class of closed systems, that is, such energy systems which are isolated from their environment.

Empirical studies indicate, however, that in socio-economic reality such regions dominate which are by their very nature open, that is energy systems which are analogous to biological organisms. Such economic regions constantly maintain inflow and outflow of energy, creating and destroying

their components, and as long as they exist, they never reach the state of thermodynamic equilibrium, but maintain, the so-called stability state, different from the previously mentioned one.

The first effort of formulating the essential characteristics of economic region in terms of an open organic system was apparently constituted by A. Löch's theory of market areas (see Lösch, 1940). This concept treats economic regions as market areas, being certain wholes composed of sets of subareas of production and consumption.

W. Isard treats economic region as an open energy system as well, that is, in his opinion, a system whose existence depends upon the inflow of energy from outside, i.e. from other economic systems. According to W. Isard (1960), both the world as a whole and each of its parts should be considered as a system of regions, within the boundaries determined by the shape of transportation system, political and cultural barriers, etc.

The main difficulty in describing the essence of open economic regions consists of quantification of the degree of openness (or closedness) of a region, that is, of determination of the measure of connections between a given region and another region.

According to K. Dziewoński (1967a), economic region is a distinguishable portion of the socio-economic space. In order to properly discriminate an economic region within the framework of the space considered it is necessary to define its separation from the surrounding outer world as well as to simultaneously and parallelly define its connections with this world. In other words, regional economy is partly, in one domain, more open, and partly, in another domain, closed.

On the other hand, R. Domański (1972, p. 7) proposes that an open economic region "...means as much as an area — a part of a greater whole — with a shaped or shaping economic setting whose elements are interconnected among themselves and with natural environment through relations of co-appearance and interdependence, and are connected with the external environment — through relations of co-appearance of great intensity". The notion of "open economic region" corresponds in this approach to such entities as towns, settlement systems, urban systems, urban-industrial agglomerations, newly industrialized regions, etc.

It is characteristic for the open economic regions that under certain conditions they approach a state which is independent of time, i.e. a stable state. This stable state, however, is maintained at a certain distance from real equilibrium. Region treated as an open system is capable of performing some work, contrary to those regions which remain in the state of equilibrium. Composition of the "open" economic region remains constant in spite of the fact that irreversible processes take place incessantly: acquisition and rejection, construction and decay.

If the stable state is attained in the open system then it does not depend upon the initial conditions and is determined solely by the system's

parameters, such as reaction velocity, transporation characteristics, etc. This phenomenon, observed in many organic processes, is referred to as equifinality. In contradiction to the "closed" economic regions the same end state can be therefore attained equifinally from various initial conditions and in spite of disturbances of the process, From the point of view of thermodynamies "open" economic regions may remain in the state of low statistical probability, of order and organization. According to the second law of thermodynamics, physical processes tend, as a rule, towards the increase of entropy, that is, towards the states of increasing probability and decreasing order. Since all the open systems remain in a very ordered and very little probable state or even may pass over towards greater differentiation and greater organization, this characterization must also concern economic regions. According to the concept of L. von Bertalanffy (1968), who refers with that respect to the results of I. Prigogine (1965), the ultimate cause of that stems from the generalized entropy function. In the closed system entropy cannot decrease, according to the Clausius: formula $dS > 0$. In contradistinction to this situation, the total change of entropy in an open system can be represented by the formula:

$$dS = d_eS + d_iS$$

where d_eS denotes entropy change due to input, and d_iS denotes production of entropy caused by processes within the system such as, e.g. diffusion. According to the second law of thermodynamics, the component d_iS is always positive, while d_eS, resulting from entropy transport, may be, depending upon the case, both positive and negative — it will be negative in the case of acquisition of matter being potential carrier of free energy or "negative entropy".

Consequently, if economic regions are treated as analogous to open energy systems, then they are in fact treated as having the nature of living organisms, which leads to very significant conclusions of ontological character. Organisms are, in biology, by definition, organized entities. But although there exists enormous number of data on biological organization, acquired from biochemistry and other sciences, through cytology to histology and anatomy, there lacks a theory of biological organization, providing a cognitive model making it possible to explain empirical facts.

The notions characteristic of organization, be it living organism or society, are: holistic nature, growth, differentiation, hierarchical order, domination, control, competition, etc. These notions may be defined in the framework of a mathematical model of a system; moreover, with certain respect theories can be built, whose general statements can be used to draw conclusions regarding particular cases.

There are, however, many aspects of organization which can hardly be subject to quantitative analysis. This problem is not entirely alien to

natural sciences, but is not at all solved in social sciences. Theory of biological equilibrium or theory of natural selection are well-developed branches of mathematical biology and there is no doubt that they are in principle correct and that they constitute important parts of evolution and ecology domains. It is, though, difficult to apply them, for instance, to questions of organization of any social entity, say — economic region, since it is difficult to measure chosen parameters, such as, e.g. selective value.

Another question which gives rise to serious doubts in consideration of the essence of economic region in the categories of open energy systems, is the problem of its finality, or teleological character. If "open" economic region approaches a stationary state then changes appearing can be explained not only through current conditions but also through distance from the equilibrium state. It seems that the region "strives" after the equilibrium, which it can attain only in the future. In other words, the course of events in an economic region may be expressed as depending upon the future final state.

It is not difficult to note that some formulations in the concept of "open" economic regions have very distinct finalistic nature. These concepts consider finality in terms of dependence upon future. It is held in such concepts that events are not only determined by current events, but also by the ultimate state which is to be achieved, and that is how the course of events can be described. In such a case, however, finality of an economic region as an open system would mean something oposite to causality, that is — dependence of processes upon future, instead of past conditions. According to this stance, state A of an economic region would depend upon another state B to occur in the future, i.e. existing would depend upon non-existing.

CONCLUSIONS

The holistic interpretation of the essence of economic region, as seen through contemporary geographico-economic thought, breaks up into two main streams. One of them represents the opinion that economic region is a whole constituted by the sum of its elements, while the second maintains that the region is something more than just a sum of these parts. Thus, the debate over the nature of economic region joins the philosophical argument concerning generalities, that is, the argument over the relation of "singular" or "individual" to "general".

Even in such a general formulation this problem maintains its philosophical validity in economic geography. It is worth reminding that the respective question is as follows: does there exist an object of knowledge which would be different from the object of singular individual knowledge, which can be formulated using exclusively individual

names in proposition subjects, or, in other words, whether all the reality can be described adequately using solely singular names and propositions.

Concepts maintaning that economic region is a whole constituted by the sum of its parts do in fact suggest that within singular concrete events and entities "the general appears". Such a view results from the principle formulated by Leibniz, stipulating that there is no such "external denomination" which would not have its basis in some "internal denomination", meaning that every relative attribute of an entity (i.e. an attribute consisting in some relation to other entities) is in a way a product of its absolute attributes (proper for this entity when considered in itself, irrespective of relations in which it is involved). All connections linking a given element of a region, treated as additive whole, with other elements of this region are determined as absolute properties, assigned to this region's element in an immanent manner and included in its contents.

On the other hand, systemic approach treats economic region as a non-additive whole, hence as such a material setting which does not only have features different from the ones proper for each of the components separately, since this can be said of any whole, but which as a whole is subject to such regularities which cannot be derived from knowledge of regularities in force for every component of this whole separately, when this component is identified outside of the setting considered, and, furthermore, which is characterized by the fact that its individual components have essential features, determined by just these specific regularities governing the whole region.

Thus understood notion of region as a "non-additive whole" (a system does not avoid, however, a *sui generis* mystical features, consisting of the metaphysical quest of the essence of "whole" and "wholeness'. Consequently, systemic interpretation of the substratum of economic region turns to be yet another variety of the metaphysical search of the "spirit of the whole", so deeply rooted in the tradition of European idealistic philosophy.

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