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INTERNATIONAL ECONOMIC DISINTEGRATION: A METHODOLOGICAL ACCOUNT

Introduction

International economic and political disintegration is not a new phenomenon. During the history of civilization, empires have emerged and disappeared; the world economy reached a relatively high level of integration on the eve of the World War I, and then disintegrated briskly; waves of globalization, starting with great geographical discoveries, replaced those of de-globalization. In the second half of the twentieth century, the formation of international trade, economic, and integration groups of regional importance was a leading trend. However, at the beginning of the XXI century, disintegration processes have become apparent in international unions, in particular in the EU. This relatively new economic trend calls for an adequate scholarly interpretation, first and foremost, in the context of methodological evaluation. Taking into account complexity, multidimensionality, complexity, and systemic hierarchy of regional integration processes, this paper suggests the cross-disciplinary (interdisciplinary) methodology of analysis as one of the leading academic trends in the present days. The development of interdisciplinarity in science and education has been prompted by the following factors:

- inherent complexity of nature and society;
- the need to examine problems and issues that cannot be studied within individual disciplines;
- the need to solve societal problems of national and global nature; and
- thought-provoking advancement of digital technologies.

In modern methodology of crossdisciplinarity, three approaches are distinguished: interdisciplinarity¹, multidisciplinarity, and transdisciplinarity.

Multidisciplinarity implies that the points of view on the common problem of two disciplines A and B are considered at the same time without integrating them. The connection between disciplines is situational, there is no commonly defined matrix, objects are not changed and are not perfected.

In interdisciplinary approach, the points of view on the common problem of two disciplines A and B are integrated (combined) for a more generalized understanding. Interdisciplinarity also involves mutual integration of organizational concepts,

¹ Interdisciplinarity as a broader term includes multidisciplinarity and transdisciplinarity; in the narrower sense refers to interdisciplinarity itself.

methodological procedures, epistemology, terminology, data and organization of research and education.

The goal of transdisciplinarity is to study the modern world through the unity of knowledge and the solution of mega- and complex problems, based on the conceptual foundations of different disciplines and non-academic stakeholders, and one priority theorem being a foundation premise. In contrast to the integration of disciplines, here a synthesis of diverse knowledge takes place with its potential transition to a new quality, or the emergence of a new scientific field or scientific discipline.

Table 1. Key characteristics of multidisciplinarity, interdisciplinarity and transdisciplinarity

Multidisciplinarity	Interdisciplinarity	Transdisciplinarity
Juxtaposing	Interacting	Transcending
Sequencing	Integrating	Transgressing
Coordinating	Focusing	Transforming
	Blending	
	Linking	

Source: [1, p. 22]

1. Interdisciplinarity and international disintegration processes

International disintegration processes represent a complex phenomenon where economic, political, social, psychological, historical, institutional and other factors intertwine. This implies the use of transdisciplinary methodology, based on the economic paradigm that takes into account the theory and methodology of related disciplines. Transdisciplinary methodology facilitates development of methodological framework that allows not only combining knowledge of different disciplines, but also analyzing new processes and phenomena, in particular, that of international disintegration. Multidisciplinary methodology may also be used at the initial stage of research when juxtaposition, sequencing of disintegration processes and their coordination is applied. Multidisciplinarity envisages the possibility of implementing fundamental, applied and problem-oriented research. Alternatively, interdisciplinary research focuses on obtaining new knowledge of higher quality in comparison with the previous one. The epistemic dimensions of interdisciplinarity become crucial when new economic phenomena and processes such as international economic disintegration emerge.

Interdisciplinarity has three dimensions of value: breadth, integration, and transformation. Breadth consists of quantitative and qualitative indicators. On the one hand, it refers to a set of interacting disciplines, and on the other hand, to common theoretical and methodological approaches, the object of research, the creativity of a research group, the division of labor between its members, the correspondence of results to qualitative standards, etc. Success is achieved through coordination, cooperation and sharing. Smart approach to interdisciplinary

interaction contributes to the formation of self-identified, monolithic structures. The evaluation of the research project by independent and unbiased experts has utmost importance.

Integration (synthesis) ensures better vision and greater success in problem-solving. It represents a complex process of applying special concepts, mechanisms and expertise that are not limited to the components of individual disciplines (systemic principle).

Yet, one should take into account, firstly, the possibility of conceptual incompatibility of disciplines. Secondly, integration is not always the goal of interdisciplinary research in the pursuit of intellectual synthesis in a separate subject area. Thirdly, the idea of integration overlooks the fact that knowledge created in different conceptual paradigms may be incommensurable.

Transformation, the third epistemic value of interdisciplinary, suggests its potential to transform the old theories and the obsolete, dogmatized knowledge.

At the same time, transformational knowledge consists, on the one hand, of information about valid knowledge and on the other – of the window of opportunities for obtaining new knowledge. The transformational knowledge answers the question of how to achieve the goals by legal, technical, economic, cultural and other means.

Moreover, crossdisciplinary research distinguishes between instrumental and critical methodologies. Instrumental methodology aims at solving the problems of a specific discipline or a number of related disciplines. One may see that instrumental methodology prevails in multidisciplinary research at the stage of exploring the current state of an economic entity, which in this case is an international trade and economic or integrated union.

Critical interdisciplinarity focuses on dominant structures of knowledge and education and aims at their transformation. In the context of critical methodology, Volodymyr Vernadsky introduced the concept of "formal reality" designating "an idea of the environment that build upon its exploration with research techniques associated with the critical work of logic and the theory of knowledge. Formal reality, with all the indispensable complexity and incompleteness of this concept, is the starting point of all our generalizations in the field of religious, scientific and philosophical concepts." [2, p. 12-13]. In our interpretation, the formal reality is represented by the international integration processes, and scientific conceptualization of these processes show not only the transformation of the existing knowledge, but also its diversification and certain paradigmatic shifts in the epistemology of the world economy and international economic relations.

2. Methodological framework for the research of disintegration

Thus, the methodological framework for the research of disintegration has a phased nature. At the first multidisciplinary stage, the subject is considered by

different disciplines in order to comprehensively identify the prerequisites, causes, factors, objective and subjective factors, tangible and institutional impacts on the international disintegration processes. At the second transdisciplinary stage, new qualitative and quantitative parameters of the international disintegration process are distinguished, its domain in the system of international economic relations and in the field of economic science is outlined. Considering this rationale of research, Max Weber [3] emphasized that the second stage is possible only when we use the preliminary data obtained in result of solving it at the first stage, which is itself a completely new and independent task.

International integration unions are the main subjects of research and, at the outset, their state and nature can be determined by economic, political, and institutional means, using an array of corresponding disciplines and principles of multidisciplinarity. However, to take into account the direct and indirect factors it is necessary to analyze: first, the set of determinants and components of the global level; second, the regional structure of integration; and, thirdly, the nation-state entities that are part of the integration community. At the global level, the structure of the geo-economic system, the main centers of economic and political power, the nature of the relationship between them and between the center and the periphery of the world economy are considered. At the global level, it is important to take into account the current trends and developments (convergence-divergence, interdependence, cyclicity, protectionism, resource problems, competition, etc.). At the level of integration union, the main indicators include preliminary markers of its integration level and their dynamics at the beginning of disintegration processes (i.e. trade, investment, labor migration, currency and financial integration, etc.). The institutional aspects as well as the political and legal components of all three the levels are subjected to research at the 'diagnostics' stage, as they are signaling the change in the direction of the system's development from integration towards disintegration. The underlying negative institutional trends may refer to the imperfections of global regulatory mechanisms (WTO, IMF, World Bank); the inadequate laws and regulations of the integration union with regard to the level and nature of relations between its members; or the incompatibility of supranational institutions with the current format of integration, on the one hand, and the inadequate perception of supranational regulatory mechanisms by individual member states of the community , on the other. As Bohdan Hawrylyshyn noted in his report to the Club of Rome, "the union of the authorities for decision-making at a higher level than the nation-state should be counterbalanced by the high level of distribution, decentralization of decision-making at the levels from the nation-state to the various lower levels of the social structure. The need for redistribution of power instantaneously in both directions causes tension not only for Europe but also for other regions" [4, p. 101].

The macro level of disintegration has political, economic, institutional, psychological and other interdisciplinary dimensions. The political dimension is driven by the

limitations of the traditional functions of the state in the time of crisis, when the acute social and economic problems seek solution through internal forces and means, shifting the center of gravity towards foreign policy. Economic factors refer to the narrowing of the means and instruments of the national economic policy and failure to consider the specific features of the countries (historical, ethnic, cultural, etc.), lack of necessary maneuver in relations with third countries. In integration groupings, there are significant differences in the levels of socio-economic development, the organization of economies and GDP, the structure of foreign trade and its conditions, the levels of openness to the third world, which all leads to heterogeneity of the system and generates centrifugal trends (EU, NAFTA, ASEAN). The institutional component seems somewhat controversial. The root of the problem lies in the varying quality of the institutional environment of individual countries and the institutional system of the integration association, even under the formal implementation of common norms and standards. The variety of norms, cultures, traditions, customs, and mentalities affects the association and constitutes a potential threat of disintegration, are given. In some countries, there are concerns over the loss of national identity in the process of developing higher forms of integration.

Therefore, the multidisciplinary approach allows identifying the turning point, the critical threshold for disintegration processes to begin.

3. Transdisciplinary rationale of research

The purpose of transdisciplinarity is to determine the essence, content, and domain of the new economic phenomenon, the process of its development, and the formation of historical trend. "Obviously, only after we study the very phenomenon to be researched," wrote Vernadsky, "one can strive to explain it, to understand its laws" [2, p. 47].

The system of transdisciplinarity distinguishes between the four main trends.

1. The first trend is based on the modern version of the epistemic quest for the systematic integration of knowledge, rooted back to the Ancient Greece, medieval Christianity, the principles of universal causality of the Enlightenment, Hegelian philosophy, unified physical theory, etc.
2. The second trend rests on the synthetic paradigm of postmodernism.
3. The third trend stems from the critical direction of interdisciplinary research and considers transdisciplinarity not only as a transition to a new quality, but also as surmounting the current disciplinary boundaries (transgression).
4. The fourth trend is initiated by the concept of post-normal science and the "second method" of knowledge acquisition, based on the principles of logic, cybernetics, the general theory of systems, structuralism, and organizational theory.

In the transdisciplinary methodology of international disintegration processes, the methodology of evolutionary and behavioral economics (behaviorism) normally applied in the economic, social, political, institutional, psychological and other fields is suggested as the key methodological design. An evolutionary approach allows to determine qualitative differences in the functioning of the system as a "process of structural reorganization over time, that results in a form or structure different from the previous one" [5, p.7]. The analysis of the dynamics of structural changes in the international integration system that takes into account structural meta and macro level shifts and juxtaposes them are important indicators characterizing the state of the system and indicating the direction of development either towards the deepening of integration, or towards the initiation of disintegration processes. In the synergetic methodology, this state is known as bifurcation, where the instability of the system increases and its attractor structure transforms. In contrast to the widespread belief that bifurcation points are characterized by complete uncertainty of the system's further trajectory, it is also suggested that "only they allow for not forceful, informational way [...] affect the choice of system's behavior, its destiny" [6, p. 90]. This is an extremely important position for formulating practical policies and tools for disintegration challenges. Under disintegration factors, the system is gradually being transformed, gaining a different quality. In the context of the restructuring of the subject structure of the system (Brexit), the problem of its adaptability arises, and one of its features is the ability to compensate for lost potential by attracting new energy and new resources. In this way, the phylogenetic transformation of the integration system through adaptation takes place. In other words, an adaptive organic evolution of the system follows, and it is characterized by its ability to maximize the utility function while minimizing the cost function. As Friedrich Hayek emphasized, "complex structures maintain themselves through constant adaptation of their internal states to changes in the environment" [7, p. 362]. At the same time, a certain ontogenetic transformation occurs of other members of the union and of the subject, who discontinues the former links with the system. Taking into account the simultaneous impact of integration (pro-integration) and disintegration factors on the system, one can define such integration as "the model of complex interaction".

The methodological basis of behaviorism is to a large extent based on the evolutionary theory of Darwin. In particular, biology along with mathematics is a paradigm for solving static and dynamic problems. Regarding economic statics (defined as the logic of coordination), biology provides paradigmatic grounds in a systematic approach to organic systems, for example, the General System Theory of Ludwig von Bertalanffy. The historical dynamics of a system, as its second support, is defined by the concept of ontogenesis and phylogenesis, mentioned above.

Explanations of the main factors and driving forces of the disintegration processes at the beginning of the XXI century in the context of evolutionary approach can be categorized in the following way:

- diversification of production and labor that under the 4th industrial revolution surpasses not only the borders of national states, but also regional integration associations;
- increasing complexity (entropy) within large integration groups, strengthening of neo-institutional trends, where integration problems are solved on a supranational level and with a certain limitation of state sovereignty of the participating countries (entropy loss);
- budding opportunities of using additional sources and resources of economic development in the conditions of formation of global value, innovation, production, corporate and other networks;
- aggravation of contradictions at the level of ontogenesis and phylogenesis, i.e. between the socio-economic and political development of individual states and the civilizational progress of the integration community.

4. Mechanisms for solving disintegration processes

The mechanisms of disintegration are based on the methodology of system analysis, on the dialectic of the whole and its parts, and include such components as the coordination policy, the game theory, and the decision-making theory. Conceptually, the international coordination of economic policy is based on the theory of public choice and the game theory, in particular, on the classical prisoner's dilemma, formulated by Albert Tucker, a mathematician. The standard explanation for this game is as follows. Two people were caught and arrested by the police with stolen goods. However, the police lack sufficient evidence to convict them for a crime if none of them confesses. Prisoners are not allowed to communicate. If one of them pleads not guilty and points to another, then he will be released without punishment and the other will be convicted of robbery and sentenced to ten years of imprisonment. If both confess or accuse one another, then both will be found guilty and sentenced to five years for cooperation with the investigation. In case no one confesses, they both will be sentenced for one year for possession of the stolen goods (Table 2).

Table 2. The Prisoner's Dilemma

Prisoner 1	Prisoner 2	
	Betrayal	Cooperation
Betrayal	(-5, -5)	(0, -10)
Cooperation	(-10, 0)	(-1, -1)

Thus, the suspect's destiny depends on his own decision and the decision of another suspect, illustrating the structure of the game. The table matrix shows the implications of the prisoners' decisions. In order to determine the optimal strategy for prisoner 1, the outcomes of any decision should be considered depending on the decision of the other party. Consequently, when there is no communication, and hence no coordination of actions, it is more beneficial to confess and get a one-year sentence, while by non-confessing one may get ten years in prison. Thus, both confess

and are sentenced for five years in prison. In game theory, this phenomenon is called the noncooperative equilibrium, or Nash equilibrium (8, p. 119-120).

This equilibrium is not perfect. If the prisoners could communicate with each other and not confess, they would only get one year of imprisonment – a much better option for both of them. This is exactly why seeking solution to the problem through cooperation has obvious advantages. The latter version illustrates the cooperative equilibrium or cooperative behavior.

Above all, the prisoner's dilemma proves that in conditions of interdependence, rational decentralized decision-making is not optimal. This model shows that cooperation can be beneficial, but it faces difficulties in achieving sustainable cooperation because one of the players is convinced that the other wants to cooperate, but at the same time, he tends to break the arrangements and it leads to the situation when both players return to non-cooperative equilibrium. Nevertheless, this simple model is widely used for the analysis of international coordination of economic policy. This does not imply, though, that formal cooperation is always desirable. The rule says that if one player does not observe cooperative behavior, the other may not follow it in the next round (the tit-for-tat strategy or the strategy of revenge). In general, the reciprocity strategy is based on four principles: clarity, benevolence, mutuality, and mercy.

The array of coordination games includes the battle of the sexes, median games, weak link games, deer hunting, sequential gameplay, repetitive games, game arrangements, universal signaling games, and more.

The game theory that applies well to the disintegration mechanism includes the game of trust, the ultimatum game and the dictator game.

For example, the ultimatum game takes place between two players - the proposer and the responder. The proposer offers a certain amount (debt, compensation, etc.), to which the responder either agrees or disagrees. Following a series of negotiations and subsequent iterations, the parties finally reach the optimum solution (e.g. the EU and the UK). This game has two reservations. The first one is that here is no guarantee that convergence of positions will take place at some time period. And secondly, the structure of the ultimatum game is so straightforward that does not allow for serious mistakes on the part of the players.

The dictator game is similar to the ultimatum game for such in the following respects. First, the responder is transformed into the recipient, and secondly, he is passive and does not take any action. In this way, the dictator's proposal is always met. There may be a wide range of proposals that are sensitive to simple frame effects. Despite some popularity, the game dictator is not reliable a tool for testing alternative theories, characterized by few strategic interactions.

The theory of decision-making, which mainly aims to identify the implications of disintegration processes, similarly to the game theory, takes account of both individual actions and the behavior of all the players involved in the disintegration processes. The concept of rational preference has been known since the days of Herodotus and Aristotle. Back in 1662, Arnauld and Nicole formulated the principle of maximizing expected values in the decision-making process: "in order to assess how one needs to act in order to gain the good and avoid the evil, it is necessary to discuss not what good and evil are, but the probability of the emergence of good and evil, as well as the geometric relationship between them [9, p. 12].

The modern concept is based on the axiomatic principles of rational decision-making put forward by F. Ramsey (1931) and supplemented by J. von Neumann and O. Morgenstern (1947). In particular, Ramsey formulated eight axioms, according to which rational choice can be made in conditions of uncertainty. Every decision maker should be guided by these axioms, and his actions must be consistent with the principles of maximizing the expected value, the numerical probability and the value result. Neumann and Morgenstern suggested replacing the notion of value with that of utility, which corresponded better to the neoclassical economic doctrine. In the decision-making system and in the disintegration process, the concept of risk aversion is important. In this case, the primary goal is not the maximizing the expected utility, but the avoidance of negative consequences. In the conditions of loss of a certain number of utility units and the impossibility of their compensation in the short run, the option of transformation of utility into new dimensions and the use of new rules for decision making compatible with the principles of expected utility may be considered.

The analysis of collective decisions is based on the theory of social choice, namely on the Arrow's impossibility theorem and the prospects theory of Kahneman and Tversky. The main elements of the Arrow's theorem include the function of social welfare, aggregation methods, axiomatic method, welfare evaluation and voting methods. According to the theorem, the function of social prosperity - the main criterion of international economic integration - must satisfy the following four conditions: 1) the Pareto efficiency for criterion is valid if each actor prefers c over b, then society at large would prefer c over b; 2) no individual should determine a collective decision (non-dictatorship); citizens are not allowed to sell their rights to vote (no-market condition); 3) independence - the choice between the two options is independent of irrelevant alternatives (social choice, in the presence of other alternatives, should depend only on the choice (preferences) of these alternatives); 4) unrestricted domain (the requirement that all logical social preferences be allowed, streamlined, finally formulated and implemented as a clear, individualized choice) [10, p. 109]. The impossibility theorem asserts that it is impossible to fulfill all these conditions simultaneously. At the same time, in conjunction with other comparable developments, such as the Harsanyi's utilitarian theorem, the Condorcet paradox, the median voter theorem, the social choice system can achieve important scientific and

practical results. In the case of Great Britain, the choice has been made following a referendum, which in a certain way takes into account these conditions.

The prospect theory of Kahneman and Tversky is based on empirical studies of reflexive effect, reliable effect and low probability effects. It has become known as the theory of choice under risk conditions. This theory suggests modified principles of expected utility by introducing two weighted functions - values and probabilities.

The significance of the prospect theory in the methodological system stems from the possibility of a staged initial investigation of the disintegration processes and their implications in the context of utility and value.

Conclusion

An important methodological component is to determine the quantitative parameters of the effects of disintegration processes. This is the most challenging stage as it deals both with any possible gains and losses of subjects of disintegration. Taking into account the multifactorial and multivectoral effects of various factors, in the first approximation, a cost-benefit analysis may be proposed. To calculate the consequences of disintegration in certain sectors of the economy, a computable general equilibrium model, a gravity model and a new quantitative trading model are used [11, p. 50; 12, p. 135].

Thus, international economic disintegration is a complex and controversial process; its research methodology implies both ontological and epistemic measures. Interdisciplinarity creates the prerequisites for comprehensive consideration and in-depth analysis of this new phenomenon in the world economy and international economic relations.

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