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A Theoretical-applied Model of Interregional Integration of Productivity of Ukraine and Partner Countries in the Context of Formation of a New World Order

Abstract. The article analyzes the current state of the Ukrainian economy in the context of new global realities and offers the possibility of usage of a theoretical-applied model of interregional integration of productivity of Ukraine and partner countries in the context of formation of a new world order. Spatial differentiation of the productive capacity of Ukrainians depending on the country of residence makes it necessary to review the methodological foundations of the study, concentrating on productive capacity of the national economy, its sector or sphere, region or community. The offered concept of "global environment" is significantly different from established interpretations of the concepts of "globalization", "global economy", "global economic integration". The global environment is wider and deeper than the components of the geo-economic space, because it includes global information flows that interconnect complementary or antagonistic cultural and spiritual foundations of the engaged countries, including religious and mental. The theoretical-applied model of interregional integration of productivity of Ukraine proposed is being based on combination of labor; material resources; capital; energy; information; infrastructure; institutions; environmental resources; external factors and internal non-economic factors.

Keywords: interregional integration, economic growth, productivity, global environment, productive capacity, national economy, new world order

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1. Introduction

One of the main unresolved existential security problems of the development of Ukraine is the fact that a country, which back in the early 1990s possessed possibilities comparable with the other post-socialist and post-Soviet countries, had great natural resources and acquired strong factor advantages of national competitiveness, provided with a powerful military and economic sector, after 30 years of independence has rather low productivity and competitive positions in a globalized economy.

At the same time, the population of Ukraine has decreased by almost one-fifth as a result of the dysfunctions of the state policy institutions and the resulting negative socio-political, socio-economic, demographic and migration processes. Even before 2014, this was the reaction of some citizens to the problem of low productivity and quality of life.

It deserves special attention that international labor migrants from Ukraine of the last pre-war migration “wave”, like the first, second and third “waves”, added a sufficient level of productive capacity for assimilation in the recipient countries.

Large-scale flows of refugees from Ukraine after 2022 also show the appropriate level of productive capacity as a labour resource in the host countries, though this high level is not always being used. For example, in the Czech Republic, According to the Ministry of Internal Affairs of the Czech Republic, 325,000 refugees from Ukraine currently live in the country. Two-thirds of them are already employed, although often their work is below the level of qualifications acquired at home, and therefore the wages are lower than those of local workers. Czech mass media claim based on statistics: “seven out of ten refugees live in the Czech Republic below the poverty line”, while most of them have found work in the country. Statistics show that a third of employed Ukrainians in the Czech Republic receive a lower salary than their Czech colleagues for the same work, with hourly salary of refugees often below 6 euros. 41% of employed Ukrainian refugees for employment perform less qualified work, often not in their field, while only 30% of refugees found a job with the appropriate qualifications they had in Ukraine. Sometimes for well-paid job, they take on hard work that requires greater physical effort in difficult conditions. Half of the interviewed refugees indicated that they work late in the evening and during weekends. In general, according to statistics, 55% of Ukrainians often work in severe, unstable condi-

tions (Radio Svoboda, 2023). In Great Britain, where relatively higher qualification requirements for employees were applied, dated February 15, 2023, as it was reported by the Ambassador of Ukraine V. Prystayko, 42% of 160,000 refugees found temporary work (Chas.News, 2023)

2. Methodological Foundations and Concepts

An observed phenomenon of spatial differentiation of the productive capacity of Ukrainians depending on the country of residence makes it necessary to review the methodological foundations of the study, concentrating on productive capacity of the national economy, its sector or sphere, region or community.

For this, it is necessary to take into account the influence of external systems of different levels of hierarchy and scales. Since the end of the 20th century, a new stage of formation of metasystemic characteristics of the global economy is taking place. Despite the differences in methodological approaches to the interpretation of paradigms of globalization, anti-, alter-, and, more recently, deglobalization or reglobalization, there is no objection to the imperative nature of the impact of global challenges on national macrosystems, the security of their development, not only in static, but also in dynamic dimension.

This influence is especially reflected in the sectoral and regional subsystems of the macrosystem of the state. Therefore, economic science must dynamically develop in accordance with these challenges, which in a broad sense should be treated as challenges of the global environment. This makes extremely actual the importance of conducting interdisciplinary studies of the economy with unconditional consideration of external influence, as well as intrasystemic threats of the domestic model of “clan capitalism” (according to J. Lough) and the related pseudo-model of exclusive regulation of the economy, described in (Shults, 2022).

The concept of „global environment” we offer is significantly different from established interpretations of the concepts of “globalization”, “global economy”, “global economic integration”. First of all, the global environment is wider and deeper than the components of the geo-economic space, because it includes global information flows that interconnect complementary or antagonistic cultural and spiritual foundations of the engaged countries, including religious and mental.

The global environment also includes global environmental, man-made risks and threats to national security under the influence of various countries and international enterprises with future transaction costs of different magnitudes and time parameters for neutralizing their consequences. V. Novytskyi in the context

of the model of resource usage treated world production as “... economically expedient processing of global natural resources by mankind” (Novytskyi, 2005); at the same time, the use of, for example, natural resources must necessarily be accompanied by appropriate „environmental” taxes, in which Ukraine radically lags behind the EU countries (Zhouk, 2023).

In our understanding, the concept of „global environment” should be expanded beyond the usage of natural, land and water resources, therefore it should also include specific climatic, space, environmental, information resources.

Taking into consideration the concept of the global environment and considering the three main political alternatives of the neoliberal experiment (nationalism of the extreme right, reformism of the center-left, progressive left) as outdated and those that guarantee further stagnation, inequality, degradation of the surrounding environment, political hostility, Joseph Stiglitz formulated four priorities of “progressive capitalism”:

- ▶ restoring the balance between markets, the state and civil society;
- ▶ recognition of the results of scientific research and social organization for the common good as “the wealth of the nation”;
- ▶ solving the problem of the concentration of market power as the cause of a high degree of inequality and low rates of economic growth;
- ▶ breaking the link between economic power and political influence, which mutually reinforce and reproduce each other (Stiglitz, 2003).

However, the priorities proposed by J. Stiglitz, critical evaluations of reforms in post-socialist and post-Soviet countries, the role of international institutions, as well as the need for transition to globalization with a human face leave out of consideration the dominant characteristic of the global environment. This characteristic we want to emphasise is an unformedness, or, more precisely, the complete absence of institutional basis of management, which creates objective prerequisites for meta-, mega-, macro- and mesosystemic shock shifts, crisis and disasters.

While the global economy, including the processes of global economic integration, has at least some institutions engaged in multilateral regulation of world trade or other types of international economic relations at the appropriate level of hierarchy (international organizations, management bodies of megaregional associations), in the meantime the global environment still has no institutional regulators, whose role might be extremely critical in the context of hidden connections (according to Fritjof Capra (Capra, 2002), or, more precisely, the relations between its subjects and objects.

The global environment, its impact on the global economy and national economies requires a detailed study, especially in terms of the essential characteristics of the challenges, which are characterized by the uncertainty and irrationality of the causes and moments of occurrence, as well as the consequences for national economies in the current time period and in the strategic perspective.

We have to emphasize that all subsystems of the national macrosystem, including regional ones, are the objects of positive or negative influence of the global environment. On the other hand, nowadays, regions are not only objects, but also subjects of the metasytem of the global environment and its subsystems – the global economy, mega-regional economic associations, international relations, including economic ones.

The challenges of the global environment for Ukraine include Russian aggression, which has finally transformed into full-scale war. Despite the unprecedented scale of sanctions against the aggressor, so far Russia is able the macroeconomic situation stable, at least for the short-term period. The consequences of expanding sanctions against the export of energy resources, the high-tech sector of the Russian economy, and the sanctions against family members of Russian oligarchs, propagandists and the military can be considered delayed in the short- and even medium-term time period.

Even a cursory analysis of the sanctions policy leads to the conclusion that their influence on the immediate cease of hostilities and the withdrawal of occupying troops from Ukraine is insignificant, although after almost a year of war, as of January 2023, there is a certain deficit in the state budget and balance of payments in Russia. However, in general, it is possible to assert the real helplessness of multilateral systems of regulating the world order and the long-term nature of war. It is significant that on many discussion platforms of leading scientific and expert centers, the war is viewed as the “Ukrainian crisis”, leaving out the root cause – Russian aggression.

Despite the broad support of Ukraine and the condemnation of the aggressor by most countries of the world, ambiguous processes are observed in the sanctions policy of individual EU member states, obviously revealing the dominance of their national economic and political interests over the strategic goals of global security. Moreover, there are already threats from authorized people and institutions regarding their protection in international courts.

Summarizing, it can be stated that Russian aggression revealed hidden contradictions and problems of development, including global security, both in the European Union and in the world in general. The commission of a number of war crimes by the Russian aggressor, especially the terrorist act – the destruction of the Kakhovka Dam, the inadequate response to them by the institutions of the

global environment and mega-regional entities (UN, EU, IAEA, etc.) once again confirmed the ineffectiveness of the institutional metasystem of the world order, its instability and inability to face the shock consequences of actions aggressive leaders of irrational nations.

3. Strategic Concepts and Models of Transformation of Ukrainian Economy

The transformation of the hybrid form of Russia's permanent war with Ukraine into a full-scale aggression aimed at the destruction of our state determines the urgency of revising established methodological approaches both to solving acute current socio-economic, humanitarian and security problems at all levels of the management hierarchy, including regional, and development and implementation of foreign policy, strategies of national, including regional development based on modern interdisciplinary approaches.

First of all, it refers to the introduction into the research area of strategizing methods of researching the productive capacity of nations approved by European and world practice with their adaptation at the regional and interregional levels of the system hierarchy. Accordingly, this requires a critical analysis of methodological approaches to determining the object-subject characteristics of regional policy in terms of the productive capacity of regions.

Research on the productive capacity of the nation, started in Ukraine in 2017 by A. Filipenko, in the conditions of war, further development is needed in the following methodological and applied aspects:

1) carrying out a systematic analysis of methodological approaches to the selection and analysis of productive capacity factors used:

- ▶ in the KLEMS model (labor, capital, energy, materials, services, etc.);
- ▶ by Canadian scientists (intermediate and labor costs, costs of reproductive capital, material and production reserves, land and other natural resources; improvement of the environment; working capital, cash and other financial instruments; knowledge capital, infrastructure);
- ▶ in the OECD working documents, "spatial" (agglomerations, infrastructure, geography) and "spatial" (human capital, labor legislation, industry level, innovation and dynamism) factors;
- ▶ by British scientists with an emphasis on regional productivity differentiation.

2) generalization and addition of the above mentioned and other methodological approaches as the basis of interdisciplinary studies of the factors of productive capacity most important for the security of the development of the economy of Ukraine and its regions, namely: definition of the subject, object, goal, conceptual principles, formalized form, set of interconnected methods and the sequence of their application, outlining the problems of information provision. This means the necessity of transformation of the methodological foundations of research and management of the productive capacity of the regions of Ukraine.

First of all, let's emphasize that the subject of the methodology covers not only the study of productive capacity, but also the management of its factors to achieve a defined goal — to maximize positive outcome in a strategic perspective. To some extent, this goal can be interpreted as strategic competitiveness in a dynamic dimension.

Secondly, the conceptually important principle of the methodology is the recognition of the imperative nature of radical structural changes in the system of factors of the productive capacity of the nation, the national macrosystem, the population of the region, and the regional economy. sector (industry, sphere) under the influence of global challenges. At the same time, the imperative of these shifts must be considered in a dual sense, as natural changes due to external influence and as objectively necessary goal-oriented management actions to achieve defined goals.

Thirdly, the object of regional policy according to the theory of systems is appropriate to consider the totality (set) of main (natural and acquired material resources; human, including intellectual, and financial capital; institutional and physical infrastructure; spatial location) and partial (informational, cultural and spiritual-mental, ecological and other) factors of the productive capacity of regions.

Such a set of interconnected by certain relations and goal-oriented to achieve a defined strategic goal — the formation and development of factors of productive capacity to the level rationally possible in modern conditions and their maximum use — objectively possesses systemic characteristics and, therefore, can be treated as a system.

Fourthly, quantitative and qualitative changes in the system of productive capacity factors as a result of their management, which includes their interrelated preservation, development, usage (resulting in is the dynamic competitiveness of the region)) has to be treated as a process. At the same time, management must ensure viability (according to William Ross Ashby and Anthony Stafford Beer) and shock resistance of the system of productive capacity factors and the regional socio-economic system in general.

In a formalized form, the theoretical and methodological model of productive capacity (Productive Capability, PCA) of the nation, national economy, its sector, sphere, region, community can be depicted as a function of general and complementary (partial) factors:

$$PCA = F\{L, R, C, E, Info, Infra, Inst, Env, Ext, Int\}, \quad (1)$$

each of which, in turn is also considered as a function in the time period $t = 1, T$. Then, in a more detailed form, we get the functional of functionals:

$$PCA(t) = F\{F(L \times t); F(R \times t); F(C \times t); F(E \times t); F(Info \times t); F(Infra \times t); F(Env \times t); F(Ext \times t); F(Int \times t)\}, \quad (2)$$

where: L – labor; R – (material) resources; C – capital; E – energy; $Info$ – information; $Infra$ – infrastructure; $Inst$ – institutions; Env – environmental resources; Ext – external factors; Int – internal non-economic factors.

We have to emphasize that each of these functions in the process of researching productive capacity is also subject to disaggregation due to the following reasons. First of all, the variables themselves become more or less important under the influence of the global environment for achieving the desired level of productive capacity, are subject to detailing. For example, for human capital, as a general factor of the productive capacity of a specific branch (sector, field) of the economy, in the construction sector, educational characteristics may shift from higher education to professional, more specialized education of the middle level. For the material factor of the productive capacity of the military-economic sector of greater importance are not products of the semiconductor industry (chips), but chemical elements (germanium, silicon, lithium etc.) and the scientific and technological subfactor of their production.

4. Conclusions

Under the influence of external challenges of the global environment and negative or positive internal system factors, the characteristics of the functions of productive capacity factors change: from linear to nonlinear, from quantitative to qualitative and vague.

The sequence of interrelated methods and research stages includes:

1) a critical analysis of the methodological basis of the “productive capacity of nations” in terms of the essential characteristics of the concept, possibilities and criteria for its typology:

2) tracking the long-term dynamics of indicators of the productive capacity of the Ukrainian nation in the regional dimension for the period 1989-2023 based on wavelet analysis methods;

3) typology of productive capacity according to structural-spatial, sectoral, temporal, system-hierarchical criteria;

4) analysis of structural changes in the system of general and partial factors of the productive capacity of the regions of Ukraine in war conditions;

5) development of methodological approaches and identification of structural changes;

6) keeping unconditional compliance with the criterion of economic security, it is necessary to carry out:

- ▶ determination of strategically priority factors for the study of the productive capacity of sectors (spheres) (military-economic, scientific-technological, educational) of the economy and types of economic activity;
- ▶ ranking of productive capacity factors in the regional and species dimension;
- ▶ justification of the target function, time and other parameters of the system-dynamic model of development and the use of the factor potential of the productive capacity of the regions of Ukraine in conditions of war;
- ▶ systematic analysis of the dynamics of the indicator of productive capacity (IPCA) and justification of the conceptual basis of strategizing the measures of managing the productive capacity of the regions
- ▶ assessment of the efficiency of production (productive) systems by the DEA method and comparative analysis of indicators of productive capacity obtained by the methods of TFP or MFP, KLEMS etc.
- ▶ conducting an institutional analysis of strategic documents and a comparative analysis of indicators of the productive capacity of countries, in particular, such EU member states as Finland, Austria, Slovenia etc., which successfully carried out transformational transformations in the process of European integration.

The obtained results are a prerequisite for further research into the factor potential of the productive capacity of the military-economic and scientific-technological sectors of Ukraine and partner countries (Great Britain, Poland, the Baltic States). The conceptual foundations and means of implementing the paradigm of interregional cooperation are:

- ▶ recognition of the imperative nature of threats to national security as a result of the challenges of the global environment, primarily Russian aggression and aggressive intentions of other countries;
- ▶ the need to search for alternative global mega-integration models, in particular political-military economic mini-groups outside the European Union, as well as a structural model of European integration (we note that we consider the structural model as complementary to the systemic model, the realism of which, given the unchanged state institutions in Ukraine in the medium term, is quite doubtful);
- ▶ analysis of institutional changes in the EU and Poland in the context of the Ukrainian perspective, the experience of convergence of the institutional infrastructure of entrepreneurship in Poland and the European Union at the stage of preparation and after joining the EU;
- ▶ the study of structural changes in the system of general and partial factors of the productive capacity of entrepreneurship in the regions of Ukraine in the conditions of the war and the post-war period;
- ▶ development of methodology and selection of partner countries for the implementation of models of interregional integration with partner countries and a structural model of European integration based on an assessment of the complementarity of peripheral and regional factor potential of productive capacity;
- ▶ determination of priority sectors (spheres) of the economy of Ukraine (military-economic, scientific-technological, educational), types of economic activity, regions of Ukraine and partner countries for the implementation of the model of interregional cooperation;
- ▶ the study of economic relations of Ukraine with the EU and partner countries in the global environment, adaptation of the experience of economic cooperation with unconditional observance of the criteria of maximum convergence and national security, quantitative analysis of the structure, volumes, efficiency, complementarity, technology of foreign trade between Ukraine and Poland and the countries-partners;
- ▶ substantiation of sectoral and sectoral priorities for the formation of “poles of growth” in the military-economic and scientific-technological sectors of the economy of the participating countries;
- ▶ ranking factors of the productive capacity of the regions of Ukraine and partner countries and assessing their complementarity for the selection of forms and methods of implementation of the integration model, tools for systemic countermeasures against threats to the economic security and stability of Ukraine at the stage of post-war recovery.

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Model międzyregionalnej integracji produktywności Ukrainy i krajów partnerskich w kontekście kształtowania się nowego porządku świata

Streszczenie. Artykuł analizuje aktualny stan gospodarki ukraińskiej w kontekście nowych realiów globalnych i proponuje możliwość wykorzystania modelu międzyregionalnej integracji produktywności Ukrainy i krajów partnerskich w kontekście kształtowania się nowego porządku światowego. Przestrzenne różnicowanie zdolności produkcyjnych Ukraińców w zależności od kraju zamieszkania powoduje konieczność przeglądu podstaw metodologicznych badań, koncentrując się na potencjale produkcyjnym gospodarki narodowej, jej sektorze lub sferze, regionie czy społeczności. Proponowana koncepcja „środowiska globalnego” znacząco odbiega od utartych interpretacji pojęć „globalizacja”, „gospodarka globalna”, „globalna integracja gospodarcza”. Środowisko globalne jest szersze i głębsze niż elementy przestrzeni geoeconomicznej, gdyż obejmuje globalne przepływy informacji, które łączą komplementarne lub antagonistyczne fundamenty kulturowe i duchowe zaangażowanych krajów, w tym religijne i mentalne. Zaproponowany model międzyregionalnej integracji produktywności Ukrainy opiera się na połączeniu pracy; zasobów materialnych; kapitału; energii; informacji; infrastruktury; instytucji; zasobów środowiska; czynników zewnętrznych i wewnętrznych czynników pozaekonomicznych.

Słowa kluczowe: integracja międzyregionalna, wzrost gospodarczy, produktywność, środowisko globalne, zdolności produkcyjne, gospodarka narodowa, nowy porządek świata

