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The Sustainable Development and Resilience of Socio-Economic System: Conceptualization and Diagnostics of Problems in Conditions of Global Challenges and Shocks

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ABSTRACT

Today, the issue of ensuring the sustainable development of socio-economic systems is more relevant than ever. The study used an interdisciplinary approach. Based on this approach, it is proposed to interpret the stability and sustainable development of the socio-economic system in the context of global instability as its ability to recover and reorient itself after the impact of external global shocks and challenges due to adaptive internal drivers. The practical implementation of the author's methodological approach to assessing the sustainability and sustainable development of the socio-economic system on the basis of a retrospective section reveals that the most negative impact of the global financial and economic crisis and hostilities was in the context of actual GDP per capita. decline over the past 15 years. The article highlights the main factors for reducing the stability and sustainable development of the socio-economic system in the context of the shock of the COVID-19 pandemic. The study has its limitations, as it was carried out to a greater extent in the context of the realities and indicators of Ukraine. Similar analyzes are planned for other countries in the future.

1. INTRODUCTION

The research of dynamic socio-economic systems gains increasing relevance in global uncertainty, especially in terms of the analysis of complex systems' behavioral factors with peculiar non-linear dynamics and unpredictable development trends and assessment of interactions, synergy, and multiplier effect in cooperation and interdependence, adaptive and evolutional behavior of economic entities, resilience to external challenges and threats, etc.

The increasing resilience to unstable changes (shocks) of the external environment related to global economic crises, natural and man-made catastrophes (loss of global biodiversity, climate change, increasing environmental pollution, natural disasters), global institutional economic and political transformations (solutions), political-ideological crises, technological and innovative breakthroughs, diplomatic confrontation, wars, pandemics, etc. becomes the strategic imperative and main competitive advantage for socio-economic systems in conditions of global challenges and shocks.

Russian military aggression against Ukraine is the greatest challenge and shock for the socio-economic system nowadays. Quantitative estimates of Ukraine's GDP decline caused by the war are rather conditional as the escalation of hostilities continues, the losses of production and infrastructure capacity of Ukraine increase daily, and there are no signs of the end to the military intervention of the Russian federation. It brings the topic of our research to the fore and requires the development of a set of theoretical and methodological tools to secure the resilience of the national socio-economic system to external challenges and threats by granting it the ability to quickly react and restore the growth trajectory.

Moreover, global trends in current conditions change the vector of their impact and have a determining effect on the capacity of sustainable development, given the:

– increasing polycentricity that leads to the intensification of competition between global centers, redistribution of resources, markets, and impact areas, and the emergence of "political unions' games" mostly aiming to use the tools of economic pressure on the countries and regions in their race for energy resources and search for new energy sources;

– expansion of protectionism trends and global asymmetry attempts at stronger protection of national economic systems, and pursuit of minimization of dependence on imported products;

– falling functionality level of international institutes due to the emergence of new problems and tasks in conditions of current global challenges;

– beginning of the regionalization of virtual networks with the purpose of defense against cyberattacks, mass surveillance systems, and information warfare not only in terms of financial-economic operations but other types and ways of information exchange.

Therefore, the speed of any socio-economic system's (national economy, macroregion, region, industry, or company) recovery from recession and return to economic growth vector depends on its ability for resilience (adaptability to shocks).

The article's purpose is to conceptualize the resilience and sustainable development of a socio-economic system and inspect the problems of the resilience and sustainable

development of a socio-economic system in conditions of global challenges and shocks.

According to the authors, the key significance of this study is that the article proposes the author's conceptualization of the sustainability and sustainable development of the socio-economic system in the context of global instability, which classifies the drivers of the sustainability of the socio-economic system, identifies the types of sustainability of the socio-economic system and, in contrast to from the existing ones, the features of sustainability and sustainable development of the socio-economic system in the plane of "resilience ↔ shock" are distinguished, and the principles of ensuring sustainability and sustainable development of the socio-economic system in the context of global instability are systematized.

Thus, the main essence of this article suggests to develop a set of theoretical and methodological tools to ensure the resilience of national socio-economic systems to external challenges and threats by giving them the ability to respond quickly and recover their growth trajectory.

The article consists of the following structural parts: an introduction with an explanation of the relevance and prerequisites for the study, a review of the relevant literature, a description of the methodology, a description of the study and the results obtained, discussions and comparisons of this study with existing ones, and conclusions.

2. LITERATURE REVIEW

Many experts note that the relevance and urgency of sustainable development issues appeared at the end of the 20th century. It was then that, as part of the development of the Club of Rome, it became necessary to investigate the consequences of large and large-scale decisions that had taken place and to find the interconnection and interdependence of these decisions and the chosen path of development [1].

According to Niaz [2], the concept of sustainable development implies the unconditional and direct coordination of the efforts of numerous actors - primarily all states (represented by their authorities) that make and implement common decisions to ensure sustainable development.

Awan et al. [3] in the languages of instability of the political, economic, military, and epidemic situation, the search for mechanisms to ensure the sustainable development of socio-economic systems aimed at a significant increase in innovation activity, the concentration of resources in the leading areas of scientific and technological progress, the intellectualization of the main factors of production, and also the formation of such production and economic systems capable of providing GDP growth and a new quality of life of the population on an innovative basis is of key importance.

Economic literature addressing the research of socio-economic systems' resilience in global shocks can be divided into two types [4-5]:

1. Mostly of theoretical orientation. It includes articles that develop existing/provide new theoretical frameworks regarding the nature, features, and drivers of socio-economic systems' resilience, etc. based on the available literature (e.g., the studies of Carriere [6], Friedman [7], Martin [8], Melnyk [9], Simmie [10]).

2. Empirical and thematic. In this type of literature, the researchers assess the resilience of socio-economic systems or their elements in case of specific global shocks and challenges. For instance, in financial-economic crises (e.g., the studies of Doran [11]), the COVID-19 pandemic [12-14], wars, and other deviations. In addition, empirical/thematic studies of the resilience of individual spatial and social systems from the point of view of certain aspects of their life activities are also common in the scientific literature (e.g., the studies of Walker [15], Boorman and Fajgenbaum [16], Rizzi and Graziano [17]).

The issue of well-grounded management of the resilience of Ukraine's socio-economic development in global instability becomes especially relevant. It is confirmed by the widespread use of the concept of resilience in strategic documents of international organizations as a new interpretation of security in shocks since the 2010s. Resilience is included in the European Union Global Strategy as of 2016, the United Nations 2030 Sustainable Development Goals, the Paris Agreement under the United Nations Framework Convention on Climate Change as of 2015, and NATO (The North Atlantic Treaty Organization) documents on countering terrorism. Resilience has been examined by leading global experts as a new approach to the maintenance of the national economy's resilience in the world's entry into the era of comprehensiveness, non-linearity, and radical uncertainty since 2015 in the framework of the OECD (Organisation for Economic Co-operation and Development) project initiative "New Approaches to Economic Challenges" (NAEC Initiative) [18, 19].

The major factors reducing the resilience of businesses at the beginning of the war include, in the first place, the lack of orders, problems with logistics, and shortage of raw materials and components. The major destructive factors reducing the business resilience in spring and summer include the unpredictability of the security situation in the country, lack of own capital and high cost of credit funds, lack of enough solvent clients on the domestic market, destruction of supply chains, and long and expensive logistics. Meanwhile, the unlocking of Ukrainian Black Sea ports was the driver of domestic businesses' resilience growth in late summer of 2022, boosting the export activity of Ukrainian companies [20, 21].

3. METHODOLOGY

The methodology of researching the resilience and sustainable development of a socio-economic system includes a set of conceptual and theoretical-methodological approaches and directions that cover the assessment of perseverance (resilience) of different natures and scales and the management of security and adaptive properties of the system's functioning. Namely, they address the ability of a system affected by many threats and dangers to timely and efficiently withstand, absorb, adapt, change, and recover after the impact of negative factors due to maintenance, adaptation, and recovery of the core structural and functional elements. Meanwhile, synergy effects and the emergence of new properties can be observed in the system.

The methodological basis of the research on resilience and sustainable development is multifaceted since the use of an interdisciplinary approach to the study of the problem is related to cross-section methods applied in different scientific disciplines like risk management, crisis management, reliability theory, security management, system safety, and sustainable development. These research directions have

significantly impacted the establishment and development of the theory of socio-economic systems' resilience and sustainable development. The theory and methodology of the research of a system's resilience and sustainable development are formed at the intersection of these scientific concepts and as the result of a symbiosis between systems theory, complexity theory, catastrophe theory, reliability theory, theories of globalization, post-globalization, sustainable development theory, security, and risk theory, endogenous growth theory, risk management theory, theory of productivity of economic systems, conceptual approaches to the digital economy, theories of structural and institutional transformation, innovative sustainable development theory, technology waves theory, institutionalism theories, economic diversification theory, and behavioral economics theory.

Thus, the main concrete method is interdisciplinary approach in conjunction of cross-section methods. It lays the theoretical and methodological basis of this study.

4. RESEARCH RESULTS

In global instability, the resilience of a socio-economic system, in our opinion, is most fully determined (characterized) by its ability to recover and reorient after the impact of external global shocks and challenges due to internal adaptive drivers, i.e. the embedded mechanisms that catalyze the impulses for protection, update, and structural transformations, namely consolidate (attract) various assets (institutional, material, financial, informational, and labor-related) at the respective stage based on vertical and horizontal links, changing the situation in the country.

Since resilience is determined by the system's ability to absorb or mitigate losses, restructure, and recover, the adaptive drivers of a socio-economic system are mostly internal ones, namely "inherent" (e.g. evolution, manufacturing capacity, economic structure, labor market features, reserves for business development (greenfield and brownfield), the companies' ability to replace resources after their decrease under the impact of external shocks, or the ability of sectoral markets to redistribute resources in response to price signals) or "acquired" – additional efforts to smooth the consequences of external impacts (regulatory policy, monetary policy, availability of reserves, national innovative infrastructure and system, IT industry capacity, localization of value chains in the country, mobility of capital between financial and industrial sectors, access to funding, etc.).

The study and systematization of the abovementioned theoretical, methodological, and conceptual approaches have allowed offering the authors' conceptualization of the resilience and sustainable development of a socio-economic system in conditions of global instability (Figure 1), which categorizes the drivers of the resilience of a socio-economic system, identifies the types of the resilience and sustainable development of the socio-economic system, and, unlike other, outlines clear features of the resilience of the socio-economic system in the "resilience ↔ shock" plane and systematizes the principles of the resilience of the socio-economic system in conditions of global instability.

The comparative analysis proves the hypothesis that the competitiveness of a socio-economic system directly depends on its resilience level (Figure 2), namely the coefficient of correlation between the Global Resilience Index and the Global Competitiveness Index is 0.882. Therefore, resilience is the driver of the performance and efficiency of institutes, policies, and factors that determine the consistent current and mid-term economic prosperity levels. In turn, it defines the countries' ability to secure a high level of social security for their economic entities, the productivity of resource management, and technological and innovative development that impact the competitiveness of the national economy and its resilience and sustainable development.

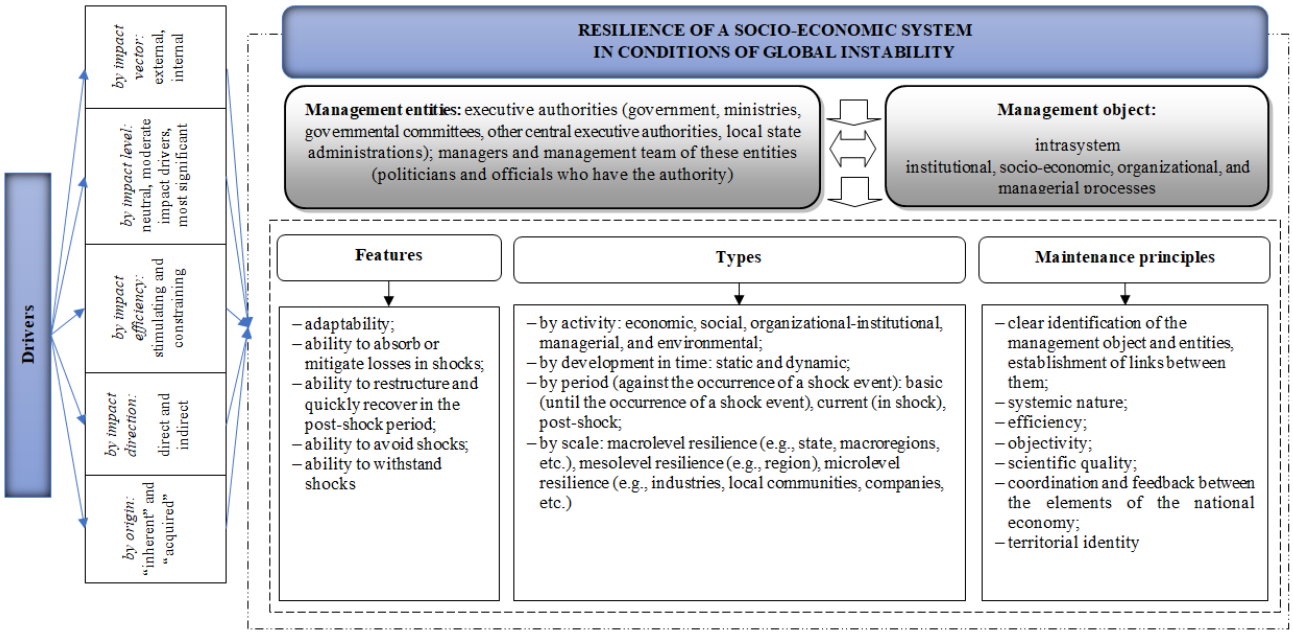

Figure 1. Conceptualization of the resilience and sustainable development of a socio-economic system in conditions of global instability

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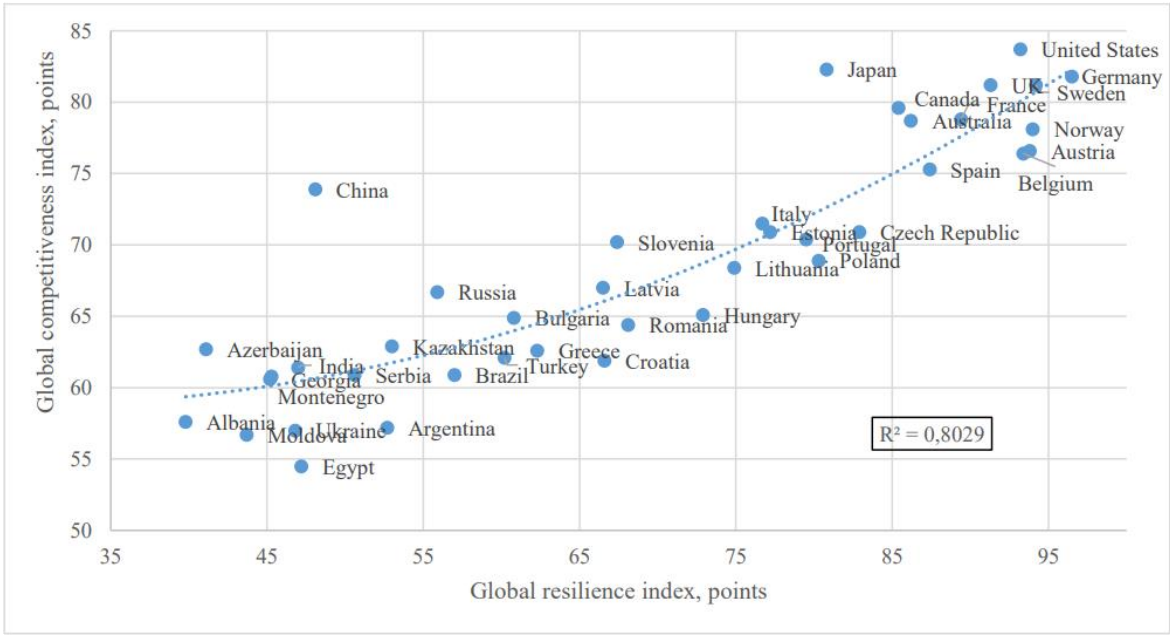

Figure 2. Dependence between the Global Resilience Index and the Global Competitiveness Index of the countries worldwide, 2022

Formed by authors

Institutional-managerial and organizational drivers, quality of structural transformations of a system as a factor of the fast overcoming of crisis phenomena, the levels of economic, political, and social globalization, and innovative and technological development directly impact the resilience of a socio-economic system (Table 1). Meanwhile, a resilient socio-economic system is formed under the impact of a range of constraining drivers, namely corruption, economic illegalization, significant social inequality, etc.

Table 1. The matrix of correlation dependencies

Impact vector	International Indices	Global Resilience Index
Stimulating	Global Innovation Index	0.902
	Globalization Index (total value)	0.889
	Global Competitiveness Index	0.882
	Human Development Index	0.871
	Social Progress Index	0.859
	Globalization Index, Social Globalization Sub-Index	0.835
	Bertelsmann Stiftung's Transformation Index	0.770
	Rule of Law Index	0.764
	Globalization Index, Political Globalization Sub-Index	0.627
	Globalization Index, Economic Globalization Sub-Index	0.576
Constraining	Corruption Perceptions Index	-0.883
	Fragile States Index	-0.844

Meanwhile, socio-economic systems characterized by high resilience and sustainable development, favorable institutional environment, etc. are more resistant to global threats and able to transform more qualitatively in shocks, preserve their competitiveness on global markets, and promote further human development and social progress.

It is worth considering the dynamics of actual and potential GDP per capita in Ukraine from 1991-2021. Potential output is calculated based on a recursive formula of Summers and DeLong by the formula (1):

$$y^*_{2009} = y^*_{2008} + 0, max_{i=1\ldots5} \left[\max \left\{ \left(\frac{y_{2009} - y^*_{2008}}{1}; \frac{y_{2010} - y^*_{2008}}{2}; \frac{y_{2011} - y^*_{2008}}{3}; \frac{y_{2012} - y^*_{2008}}{4}; \frac{y_{2013} - y^*_{2008}}{5} \right) \right\} \right] \quad (1)$$

Actual GDP per capita in $ is used for calculations. Therefore (2):

$$y^*_{2009} = 4066{,}5 + 0, max_{i=1\ldots5} \left[\max \left\{ \left(\frac{2639{,}4 - 4066{,}5}{1}; \frac{3078{,}4 - 4066{,}5}{2}; \frac{3704{,}8 - 4066{,}5}{3}; \frac{4004{,}8 - 4066{,}5}{4}; \frac{4187{,}7 - 4066{,}5}{5} \right) \right\} \right] \quad (2)$$

Potential output calculated based on the recursive formula shows the prospective growth trajectory for the national economy, i.e. the one that can occur in case of a shock event. Meanwhile, the model takes into account the economic growth trend in the previous periods (years).

The results of calculations (Figure 3) show that:

firstly, the global financial-economic crisis of 2008-2009 and hostilities of 2014-2015 had the greatest negative impact in the context of falling actual GDP per capita in Ukraine in the last 15 years;

secondly, these periods also marked the largest decline in GDP per capita in Ukraine compared to the respective potential rate, i.e. GDP that could have been achieved if the shock event hadn't occurred.

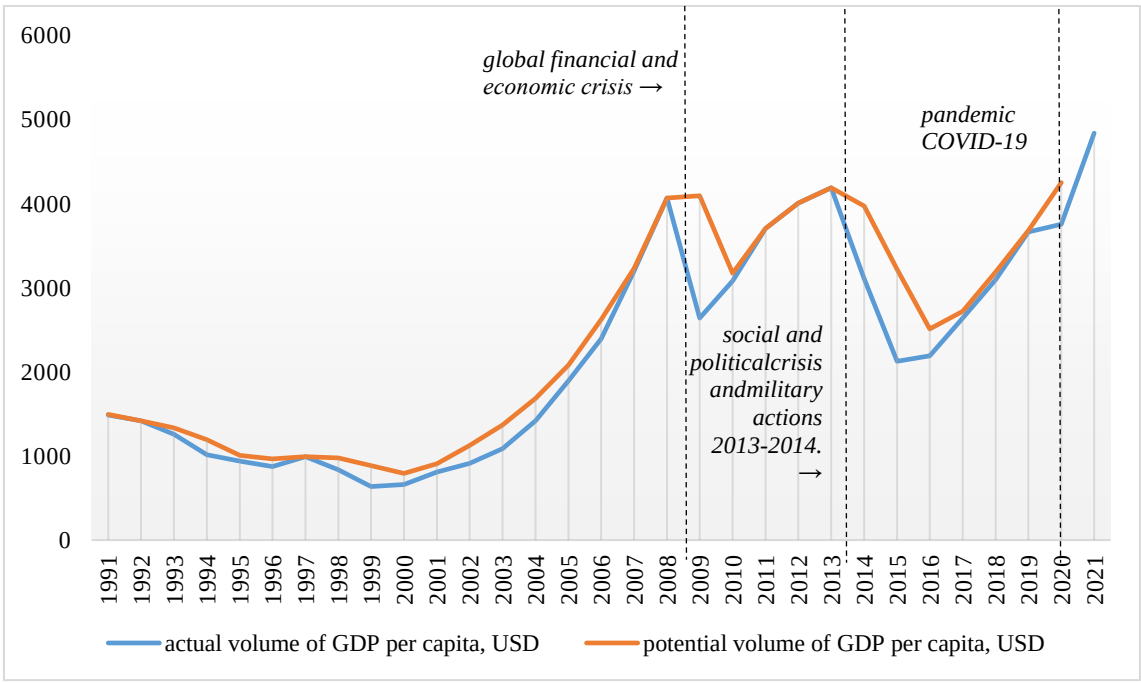

Figure 3. Dynamics of GDP per capita in Ukraine in 1991-2021, $
Formed by authors

Next, the reaction of Ukraine's national economy to the abovementioned shock events will be examined.

The financial-economic crisis of 2008-2009 constituted the powerful global shock of the 21st century. Its depth for Ukraine was 35.1% – the highest rate among 34 analyzed countries worldwide (Figure 4). Substantial scales of the crisis in Ukraine were caused, in the first place, by lack of reforms in the national economy, inefficient pre-crisis Governmental measures to strengthen the resilience and sustainable development of Ukraine's socio-economic system, drastic change of attitudes and expectations in the society and business circles of the country, and the presence of deep political conflict. These factors significantly reduced the country's resilience and sustainable development compared to other countries.

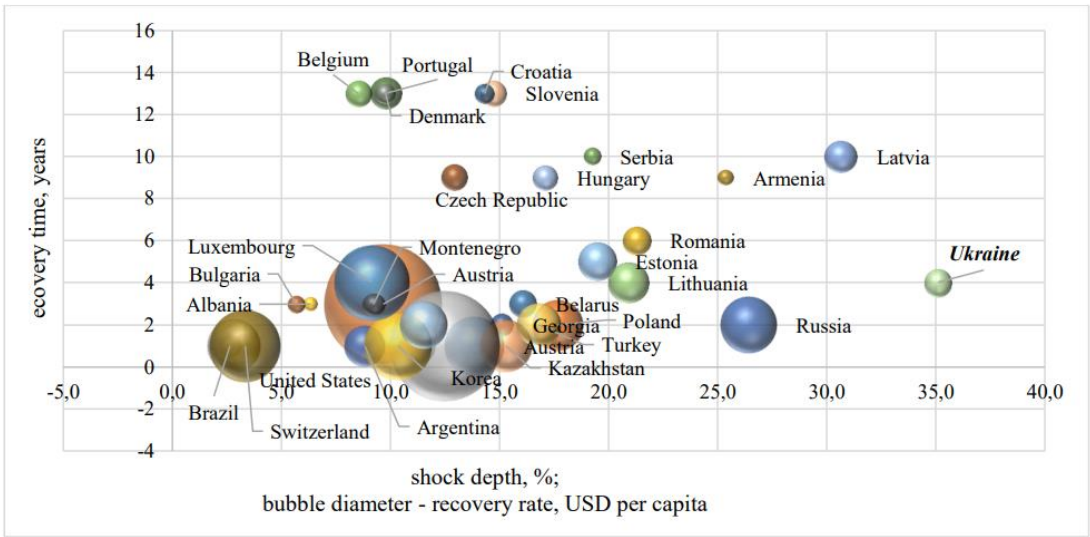

Figure 4. Scatter plot of socio-economic system's resilience and sustainable development parameters in the countries worldwide in the financial-economic crisis (by GDP per capita, $)
Formed by authors

When assessing the resilience and sustainable development of Ukraine's economy, it is important to analyze its ability to withstand a shock and recover after the shock compared to other socio-economic systems since any economy develops in close interaction with other ones rather than separately, especially in globalization. Therefore, in this case, we consider the resilience and sustainable development parameters of Ukraine concerning such systems as the world, OECD countries, Europe and Central Asia macroregion, the European Union, and a group of countries with below-average income. The following macroeconomic parameters are analyzed as the ground for interregional/interterritorial disparities: GDP per capita in dollar equivalent, employment and unemployment of economically active population, inflation index, and foreign direct investment (Table 2).

Table 2. The matrix of the resilience of socio-economic system by the parameters of relative capacity to withstand a shock and relative capacity for post-shock recovery

		Subsystem – Ukraine			
		Relative capacity to withstand a shock (P_{res})	**Relative capacity for post-shock recovery (V_{rec})**	**Relative capacity to withstand a shock (P_{res})**	**Relative capacity for post-shock recovery (V_{rec})**
		GDP per capita		***Inflation index***	
Systems	The world	0.693	1.078	1.057	0.962
	OECD countries	0.699	1.119	1.187	1.175
	Europe and Central Asia	0.741	1.450	0.946	1.244
	European Union	0.729	1.075	1.184	1.565
	Countries with below-average income	0.715	0.970	1.197	0.722
		Unemployment of economically active population		***Foreign direct investment***	
Systems	The world	1.252	0.904	0.965	0.922
	OECD countries	1.007	0.870	1.368	0.850
	Europe and Central Asia	1.094	0.914	1.271	0.932
	European Union	1.021	0.827	1.375	0.824
	Countries with below-average income	1.377	0.915	0.580	1.272

The values of parameters P_{res} and V_{rec} >1 mean that the relative capacity of a national system to withstand a shock and its capacity for the post-shock recovery (by the analyzed parameter) is higher than the respective capacity of the socio-economic system of macroregional level (the world, EU, OECD, etc.).

In conditions of the COVID-19 pandemic shock, the quarantine restrictions slowed down the dynamics of GDP growth in our country. The rate increased only by 1.7% in 2020 against 2019, while in 2016-2019, GDP increased by 3% on average.

The following are the major factors reducing the resilience of Ukraine's socio-economic system in conditions of the COVID-19 pandemic shock:

– global panic;

– a hyper-quick spread of the disease and a lack of the ways and methods of its treatment, leading to the announcement of quarantine in most countries worldwide. Moreover, the duration of quarantine restrictions was unknown;

– global transport-logistics collapse;

– suspension (complete termination in some activities) of production processes for an unknown period, causing the financial-economic crisis and turbulence in export-import operations.

The weak resilience and sustainable development of socio-economic system to the COVID-19 pandemic shock and tough quarantine restrictions slowed down the dynamics of macroeconomic development and business activity of economic entities. Whereas the impact of the introduced quarantine was generally invisible in the I quarter of 2020, tough quarantine with the ban for the activity of a significant part of economic activity types in the II quarter contributed to the decline in income of the population and business revenues and deterioration of consumer and business mood. Against the uncertainty of further development of the COVID-19 pandemic, it led to consumption reduction (rather, there was an excessive demand for some goods – medicine, antiseptics, and related goods), suspension of some investment projects, dismissal of some employees, as well as forced leaves and labor remuneration decrease. The problems with logistics intensified, contributing to the increase in production costs and prices for imported goods. Yet, in conditions of the COVID-19 pandemic and tough quarantine restrictions, despite a significant drop in economic and social resilience, the national economy managed to restore the pre-shock level for major macroeconomic parameters and boost the activity of economic entities in the short run. Meanwhile, the pandemic and quarantine restrictions worked as the factors boosting the resilience of healthcare, domestic tourism, e-commerce, and online services (since businesses had to start working online due to the forced closure of offline stores).

The destructive factors weakening the resilience and sustainable development of Ukraine's socio-economic system in 2020-2021 include unresolved military conflict in Donbas, high cost of living, low income of the population (72% of respondents in the survey emphasized the fact), and other latent factors like corruption (according to the research, corruption was in TOP-3 main problems for Ukraine in 2020 and 2021), widespread shadow economy and illegal employment, permanent labor migration from Ukraine, injustice in the judicial system, etc.

Table 3. Estimates of the depth of Ukraine's socio-economic system's shock in conditions of the 2022

Socio-economic development parameters	**2021 (actual rate)**	**2022 (estimated rate)**	**The depth of shock at the end of 2022, %**
Gross Domestic Product, million UAH	5459574	3739808	31.5
Average monthly real wages, UAH per an employee	14014	10287	26.6
Goods and services export, billion $	81.5	57.3	29.7
Goods and services import, billion $	84.2	82.1	2.5

Based on the estimates of the dynamics of the main macroeconomic parameters issued by the National Bank of Ukraine in the October 2022 inflation review, we calculate the estimates of the depth of Ukraine's socio-economic system's shock in conditions of the 2022 war across a range of parameters (Table 3).

Meanwhile, the direct reduction of Ukraine's GDP is caused by such factors as the destruction of production capacity, housing stock, non-residential infrastructure, transport, and social infrastructure, limited use of the national land fund due to its partial occupation and damage caused by mining, shelling, and pollution of Ukrainian territory, reduction of the share of employed in production, the decline in consumer consumption, reorientation of governmental expenditures in favor of areas not directly related to GDP production, growing inflation and debt obligations, national currency devaluation, direct and related investment losses, growing prices for energy resources, and falling quality of human capital due to psychological trauma and risk of the loss of life. Ongoing hostilities will lead to growing production and export losses and will probably cause many enterprises to stop activities. Industrial enterprises face the problems of currency purchase for import, aborted supply chains, poor staffing, and relocation of businesses from the areas of hostilities.

These conclusions were made on the main studies conducted by the authors and statistical official data.

5. DISCUSSIONS

According to the UN High Commissioner for Human Rights, about 13 million people failed to leave the areas of hostilities, have to stay in unsanitary conditions and suffer a shortage of food and water as of 25 May 2022.

The situation with refugees and internally displaced people aggravated interregional consumer demand imbalances due to the relocation of the population from the areas of hostilities to safer regions. Moreover, the relocation of consumer demand to European countries caused by the migration of the Ukrainian population is a considerable challenge to both social and economic resilience and sustainable development.

The large-scale war in Ukraine continues, so its socio-economic system's resilience is deteriorating further. The country faces the perspective of a lasting post-war recovery. The country's macroeconomic strategy must be reviewed to secure its long-term economic stability and growing resistance to new possible threats and shocks. In our opinion, the drivers restraining the decline in the resilience and sustainable development of socio-economic system in current conditions should include economic activity deregulation, mobilization of resources to improve the country's fiscal situation, increase in national savings for the restraint of inflation, control over the capital outflow, and accelerated integration of domestic production into global production, trade, and financial networks. These will contribute to the stabilization of the country's economic dynamics and its resilience and sustainable development recovery.

Considering similar studies of this topic, we can say that the issue of ensuring the sustainable development of socio-economic systems is relevant in today's conditions. Thus, J. Wyrwa, A. Barska, J. Jędrzejczak-Gas, P Kubiak [22] in their studies resort to determining the characteristics of the life of socio-economic systems in these conditions. But it should be noted that the range of parameters under study is limited and not represented by quantitative values. While our achievement includes a large number of parameters and presents them both in a qualitative and quantitative sense.

In separate works [23-24], the features of the functioning of the socio-economic system in conditions of instability were studied. But it should be noted that all the presented studies provide practical recommendations based on a superficial analysis of the existing situation and taking into account only a few parameters, while our study is more detailed and in-depth.

The article offers the author's conceptualization of a socio-economic system's resilience and sustainable development in global instability, which categorizes the drivers of the socio-economic system's resilience, identifies the types of the socio-economic system's resilience, and, unlike the existing ones, provides distinct features of the socio-economic system's resilience and sustainable development in the "resilience ↔ shock" plane, as well as systematizes the principles of securing the socio-economic system's resilience and sustainable development in global instability.

6. CONCLUSIONS

Thus, the purpose of the study is to conceptualize the notion of "a socio-economic system's resilience" and diagnose the problems of the resilience and sustainable development of socio-economic system in global challenges and shocks.

In its course, using an interdisciplinary approach, it was found that a socio-economic system's resilience and sustainable development to global instability is characterized by its capacity to recover and reorient after the impact of external global shocks and challenges due to internal adaptive drivers, i.e., embedded mechanisms that catalyze stimuli for protection, recovery, and structural transformations. Namely, they consolidate (attract) various assets (institutional, material, financial, informational, labor-related) on a respective stage based on vertical and horizontal links, changing the economic situation in a country.

The research allows us to argue that the socio-economic system's capacity to withstand a shock is not a constant parameter, i.e., the system's resilience against some specific shock does not guarantee its resilience against another (next) shock. On the other hand, when the shock occurs, the system can react differently to different socio-economic development parameters: it can manage to withstand the shock by some parameters and turn out to be non-resilient by others. The situation with the system's post-shock recovery is the same.

On the other hand, the research results show that the system's socio-economic resilience and sustainable development in global shocks are not always and not exclusively related to the economic well-being of the system and its pre-crisis economic growth paces. A higher capacity to withstand a shock and recover post-shock does not always correlate with economic leadership. It can rather be related to the socio-economic system's sustainable development cycle, especially the set of external and internal drivers of both stimulating and restricting impact on the development of this socio-economic system's resilience and sustainable development.

The analysis of existing studies on this topic showed that today there is no jointly agreed opinion on resolving the issue of sustainable development of the socio-economic system in the face of global challenges and upheavals, which is a

significant problem for the practical management of these systems. At the same time, in our opinion, the definition of the aforementioned parameters that characterize the level and conditions of sustainability and stability of the socio-economic system in the face of global challenges and upheavals is an important step towards the practical formation of measures for its management.

The study has its limitations, as it was carried out to a greater extent in the context of the realities and indicators of Ukraine. Similar analyzes are planned for other countries in the future.

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