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«Київський політехнічний інститут імені Ігоря Сікорського»**ECONOMIC "BUTTERFLY" AND FUTUROLOGY OF THE WAR IN UKRAINE****ЕКОНОМІЧНИЙ «МЕТЕЛИК» І ФУТУРОЛОГІЯ ВІЙНИ В УКРАЇНІ**

The war in Ukraine has exacerbated the situation of significant uncertainty in the world. Understanding economic background of the reasons and also long-term forecasting its consequences for the world economy is very important. This article is to be included into the critical mass of different points of view for developing the approach to this item. Two untypical features of the global economy were shown as the economic butterfly consequences of the previous concept of the world development. The transferring to the information society and the technogenic era assumed the main reasons of them. The main features of the contemporary stage of the global economy and the high likelihood of the wars were demonstrated in the article. But the necessity to define the future economic values correctly was highlighted. It was demonstrated that the war in Ukraine will change the branch structure of the global economy and its type. The futurological lucrative perspectives for the Ukrainian economy were shown for supporting the development of the information society and the technogenic economy.

Keywords: war in Ukraine, economic butterfly, futurology of wars, technogenic economy, information society, supporting economy, synchronization of the economy, economic forecasting.

Початок війни в Україні суттєво загострив вже існуючу ситуацію невизначеності для світу. У переважній більшості публікацій війна трактується з політичної, соціальної та культурної точок зору. Однак окрім прямих причин і наслідків вкрай актуальним також стає питання розуміння економічного підґрунтя причин і довгострокового прогнозування економічних наслідків для світу ситуації, яка складається в Україні через війну. Незважаючи на численність публікацій щодо війни в Україні, накопичення критичної маси різних думок, що надалі формуватиме колективний розум, ще триває, частиною чого і є дана стаття. У статті представлені довоєнні довгострокові перспективи одного з найбільш чутливих ринків, зміни на якому стали відчутні у всьому світі через продовольчу кризу, що тільки нарощується. Продемонстровано, що глобальна економіка зітхнула з двома нетиповими особливостями: синхронністю національних економік більшості країн, що є наслідками «економічного метелику» попередньої концепції глобалізації, та режимами з загостреннями. Причинами цього є перехід до інформаційного суспільства, а також поява техногенної економіки. Підкреслено, що замість трансформації до особливостей поточного періоду одночасного функціонування трьох технологічних ер, традиційна економіка зітхнула з економічною короткозорістю та не була адаптована до нових технологічних потреб. Проведені історичні аналогії між великою економічною депресією і поточним економічним станом більшості країн. Зазначено, що шлях подолання внутрішніх економічних криз завдяки військовим діям поза межами власної країни стає привабливим для окремих країн. Такі фактори суттєво загострили військову напруженість у світі. З футурологічної точки зору показано, що на зламі технологічних ер війни є природним явищем, однак важливе правильне визначення майбутніх економічних цінностей. Показано, що війна в Україні визначить галузеву структуру майбутньої світової економіки. Визначено, що Україна має всі перспективи зсунути зони світового прибутку у бік власної економіки, яка має перетворитися на підтримуючу економіку для розвитку інформаційної та техногенної ер.

Ключові слова: війна в Україні, економічний метелик, футурологія війни, техногенна економіка, техногенна ера, інформаційне суспільство, підтримуюча економіка, синхронізація економіки, економічне передбачення.

Formulation of the problem in general. The war in Ukraine turned into the accident that exacerbated the situation of significant uncertainty in the world. In most cases it is investigated under the political, geopolitical, social and cultural points of view. But excepting for the direct reasons, understanding the economic background of its beginning and long-term forecasting of the economic consequences of the war in Ukraine for the global world economy are very important too.

Analysis of recent studies and publications. Numerous publications about the war in Ukraine have appeared

all over the world. The authors highlighted that Russian-Ukraine conflict, been connected with the pandemic consequences, "has disrupted supply chains, increased inflationary pressures, and a potential food crisis is looming" [1]. Multilateral organizations and institutions of the world faced with a great challenge. There have been many forecasts of this situation [2; 3; 4, etc.] and many authors in the world concern about the possible scenarios of its next development. It's difficult to define the singular approach to forecasting of the consequences of the war in Ukraine because the contemporary stage of the development this

question assumes necessity of accumulation a critical mass of different points of view by different specialists to form a collective mind of this problem. And this article is one of them.

Formulating the purposes of the article. Statement of the aim is to define and substantiate possible economic consequences of the War in Ukraine for the world economy.

Methodology. The methods of the system analysis, analysis and synthesis, the methods of the historical analogies are used in the article.

Presentation of the main research material. The world food market has turned into one of the most sensory economic sectors that were the first to feel the consequences of the War in Ukraine. For this market the Ukrainian economy has always played the role of the cheap raw material economy. And in accordance with the long-term horizon, this role for the Ukrainian agricultural markets would have some positive perspectives. By 2050 the urban population (including urban slum population) will increase and equalize with the rural population (Fig. 1) [5]. It creates a shortage of the agricultural production for supporting the urban population in the future.

But the global attitude to the Ukrainian agricultural markets as to any other cheap assets and raw material economies did not have perspectives for changing yet. But the war in Ukraine has already started to change the importance of the Ukrainian economy for the world economy. And there are some hidden reasons.

Since the first crisis of the global economy in 2008-2009 the probability of World War III has been very high. During this period the global economy faced with two untypical features (Fig. 2). On the one hand most national economics were synchronized as the consequences of the economic "butterfly" of the previous globalization concept. This meant that each of these synchronized national economies lost most other countries for operating right outside during the domestic economic problems.

On the other hand, the economic situation faced with the blow-up regimes, which assumed all the processes to accelerate according to the exponential law [8]. This meant that the global economy would have to face with very frequent economic crises, stop to increase and start to approach to its zero increasing as the consequences. But the principles of the contemporary traditional economy (human needs are unlimited and resources are limited [9]) were formed under the conditions of the industrial society. And the main reason of these blow-up regimes corresponds with the fact that a new technological era, the information society, has already started and scaled up, in particular due to the pandemic. We needed to have to be ready that it would destroy the previous traditional type of the economy, but it would also create new economic values, types of economic relations, new economic roles and new economic players. Under the conditions of the information society the global economy has faced with unlimited information resources and limited human needs.

Also the next technogenic era with its Industry 4.0 has started too. And the important feature of the contemporary stage of the economy development is the fact that these three technological eras don't replace each other but will exist simultaneously in some limited borders (Fig. 3). The global economy needed its structure to be transformed in accordance with new economic requirements but faced with indifference and marketing myopia of the society. The management of the organization didn't want any technological changes in their comfort zone, the employees stayed to be indifferent for any outside information if it didn't correspond with their responsibility area. People used to read predictions, risks, wonder if they were sensational, but not act in accordance with them. For example, I conduct trainings in economics for international welder engineers from different countries in the world. And initially they don't perceive the global economy dynamics or global risks as something important for their companies or their countries at least. It seemed to be too far, too global,

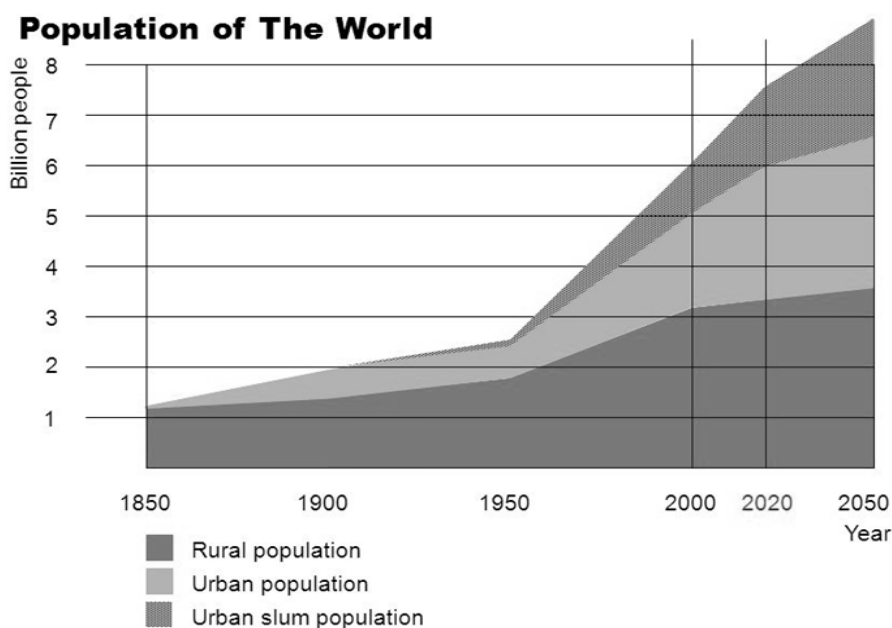


Fig. 1. Population of the World

Source: [6; 7]

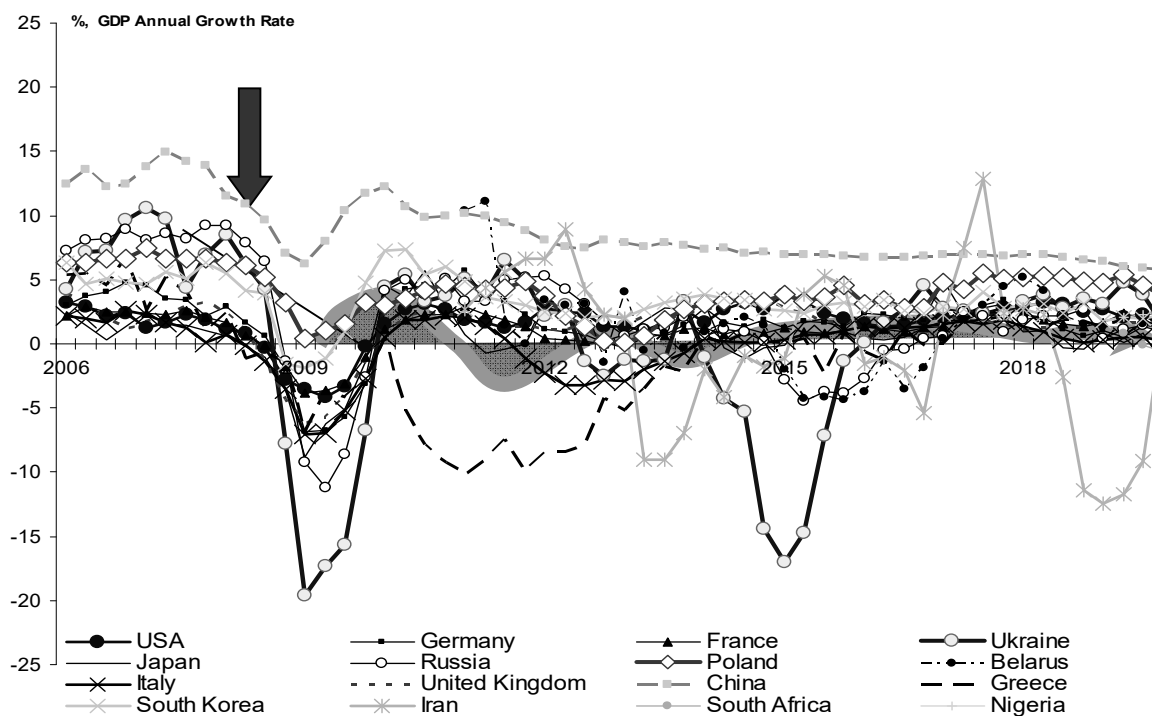


Fig. 2. The economic “butterfly” of the globalization concept

Source: built by the author on the basis of data from [10; 11]

the future too much. But we are globalized too much now, and the historical economic “butterfly” is too real for each of us regardless where we are.

Mass media started to write much about the probability of World War III. There was too much similarity of the contemporary global economy dynamics (Fig. 4) with the Great Depression in the United States (Fig. 3).

But now most countries in the world and the global world face with such kind of economic situations (Fig. 4, see Fig. 1). And this possible way of resolving own economic problems by conducting wars outside native lands has been available for every country in the world and very appealing for some of them.

The time on the “Doomsday Clock” hasn’t been changed since 2020 and now it is one hundred seconds to midnight (Fig. 6). The “Doomsday Clock” indicates what “world developments mean for the perceived likelihood of nuclear catastrophe” [14]. This clock was created by the Bulletin of the Atomic Scientists and the Security Board in consultation with eleven Nobel Laureates.

There were some facts, including economic attempts which might try to resolve the synchronic problem of the global economy. For example, the economic crises in Greece during 2008-2013, the political situation in Ukraine since the end of 2013, the economic sanctions for Iran, Russia and so on (see Fig. 1). But during these years too many violent conflicts had been broken out on the map. By 2020 the top-10 of them included the Persian Gulf, Ukraine, Afghanistan, USA and the Democratic People’s Republic of Korea, Libya, Venezuela, Kashmir, Yemen, Ethiopia, Burkina Faso [16]. And Pope Francis noticed that World War III had already started on piecemeal [17].

The coronavirus pandemic had also a chance to desynchronize the global economy but it didn’t (Fig. 7). Just China started to accelerate other countries due to its

recovering model and restructuring its economy by digital startup-projects [18]. But most other countries stayed synchronized.

And in the middle of the previous year the next global economic crisis seemed to start again simultaneously in most countries and to synchronize the global economy again.

We can see the consequences of the War in Ukraine for Ukraine and the possible forecast for it. On the one hand the consequences of the War in Ukraine could seem to turn into the possible resolving for the synchronic global economy in accordance with the “K-recovering” model due to the high possibility of the future asynchronic development of Ukraine compared with other countries (the way 1 on Fig. 6). But on the other hand all countries in the world are synchronic with Ukraine too much for being outside our economic crisis. It is our mutual crises and mutual consequences of it (the way 2 on Fig. 6).

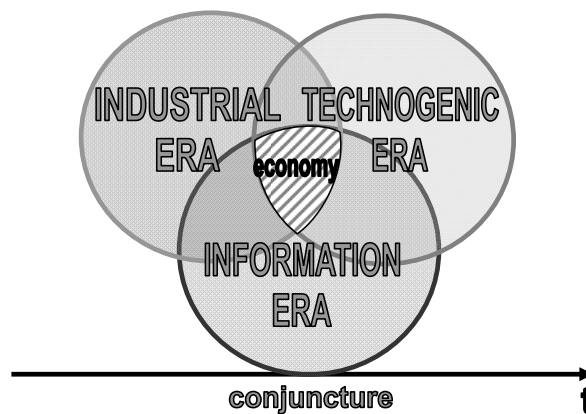


Fig. 3. The contemporary step of economic development

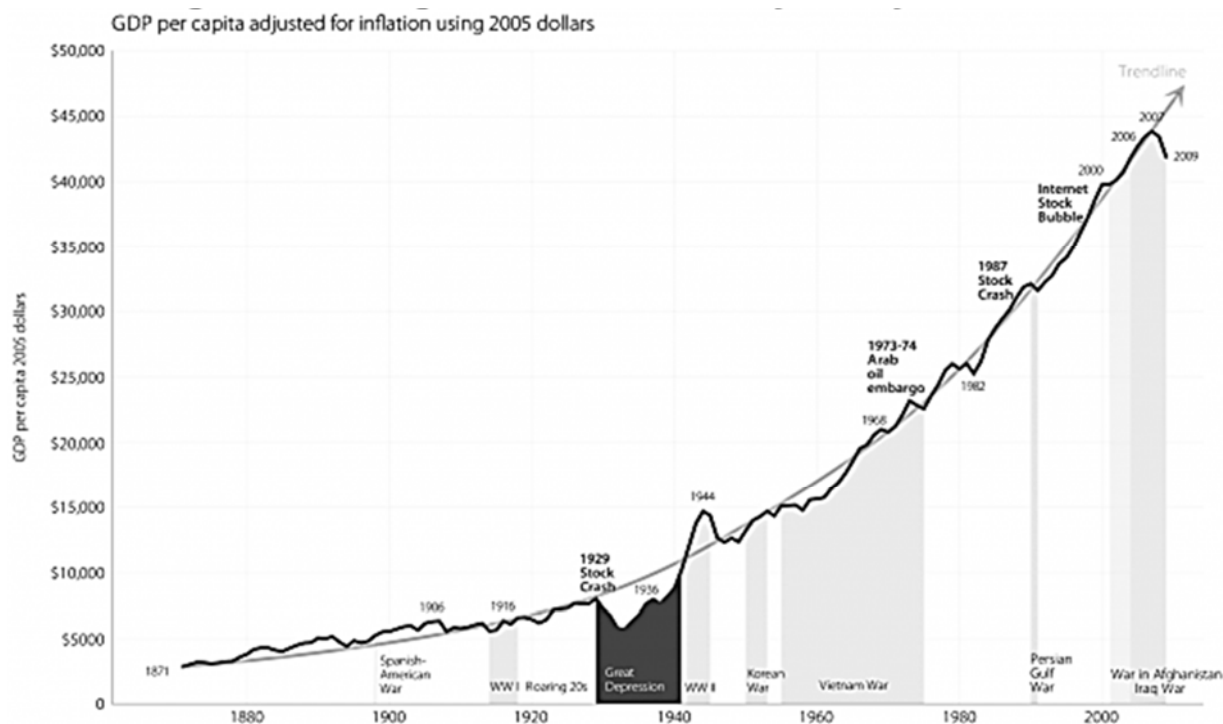


Fig. 4. Long-term real growth in US GDP per capita 1871–2009

Source: [12]

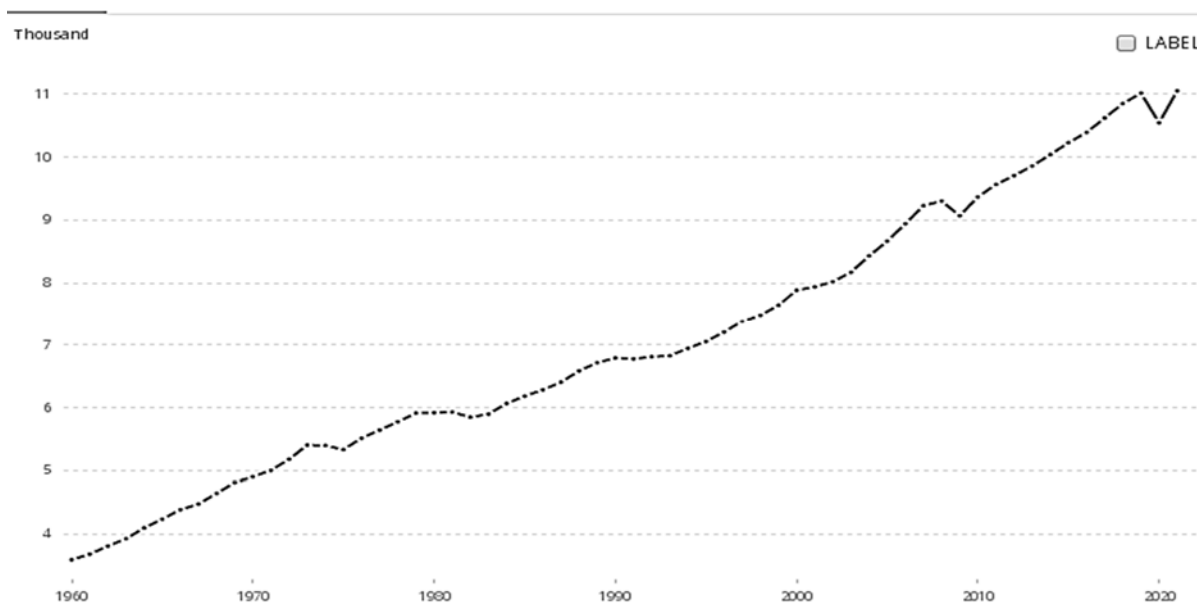


Fig. 5. World GDP per capita (constant 2015 US\$)

Source: [13]

Conclusions. What is futurology of the War in Ukraine? What do we have to do now? During the technological era transforming wars start for governance of new economic values and resources. But it is necessary to define new economic values correctly. In contrast it can turn into the attempt to return to the past into the previous industrial society with its industrial recovering construction, dated economic values and economic relations which may block the next eras' development. Now it is necessary to realize

that the previous version of the industrial society has to be transformed into the supporting industrial economy for the digital and technogenic economies.

In accordance with the futurological point of view, the war in Ukraine will be able to define and show the future economic values of the industrial economy like food, the military-industrial complex, markets of construction and delivery services, medicine, high technologies, energy industries and so on - all types of supporting industries for

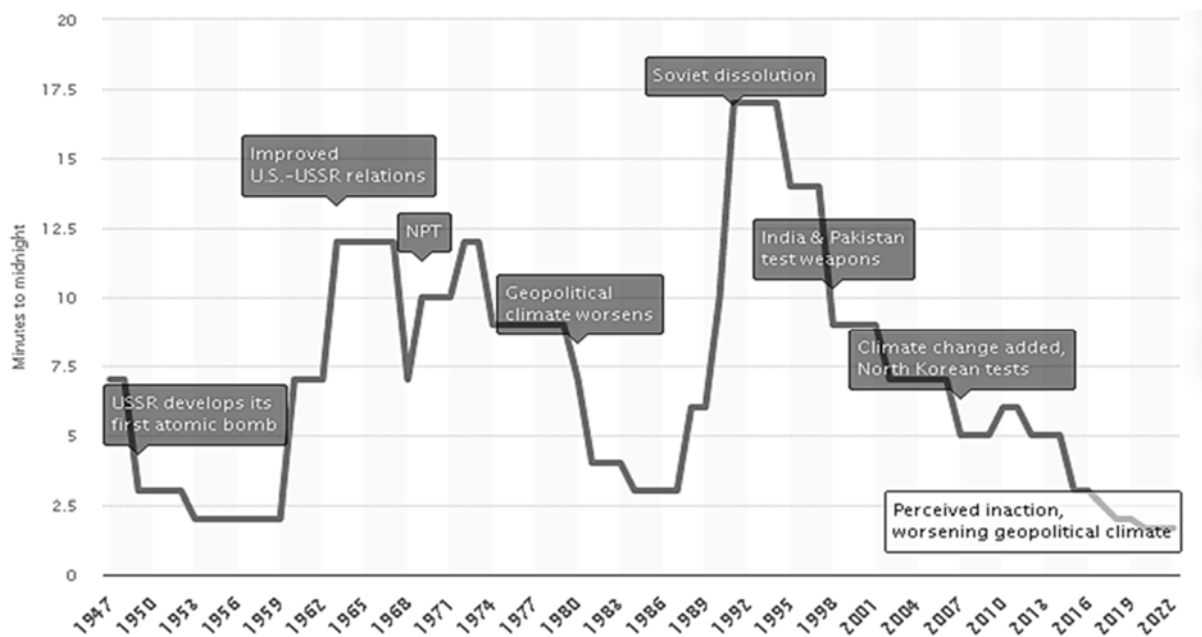


Fig. 6. Domsday clock: minutes to midnight, 1947–2020

Source: [15]

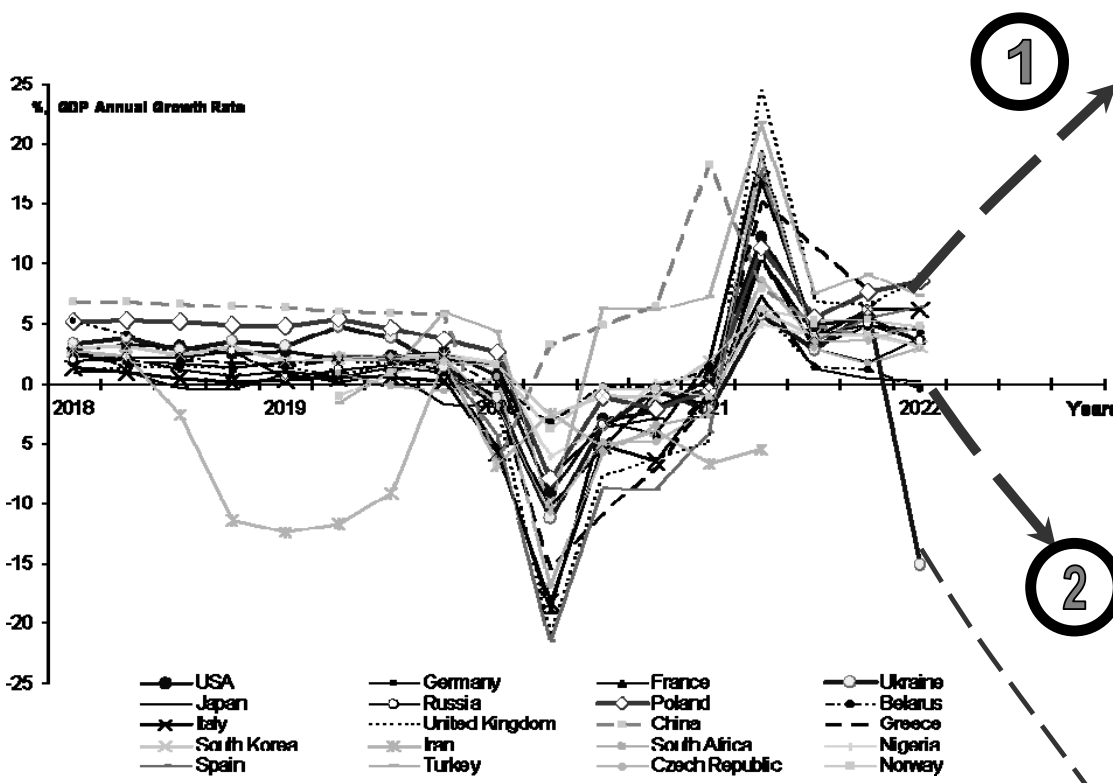


Fig. 7. The contemporary step of the world economic development dynamics

Source: built by the author on the basis of data from [11]

the information society should stay. That is why Ukraine due to its natural resources has a high chance to turn into an agricultural economy that can be the supporting economy for all other countries in the world. But the world has to realize that now this type of the Ukrainian economy is not a cheap raw material economy any more. It has to be expensive to make it possible for the digital and technogenic

economies to develop in the future. That is why profit zones are moving to Ukraine and the world should realize this fact and support it. The most valuable contribution that science can give to the society is the ability to predict the future. When we discuss the consequences of the War in Ukraine, actually we predict the next stage of the global economics development.

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