

Synergetic Efficiency of the Economic System in the Conditions of Digital Economy Development: Conceptual Approach

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Abstract— Digital economy, like any system, consists of certain structural elements, the relationship and interdependence of which lead to the functioning of the system. At the same time, the digital economy is a part of the socio – economic system, along with the real economy and the non - economic sphere – society. In order to determine the effectiveness of the economic system as a triad "social-real economy-digital economy", the traditional approach seems to be limited, and the most promising approach is through the identification of synergetic efficiency, the range of oscillations of which can take completely different values. Negative synergetic effects from the processes of digital transformation occur because of the presence of systemic dysfunction. The work considers such areas of systemic dysfunction as the labor sphere, the sphere of culture and education, as well as in the system of national security. Thus, the paper presents an attempt to develop the contours of a conceptual approach to determine the synergetic effectiveness of the presence of the digital economy.

Keywords— *digital economy; digital economy efficiency; synergetic efficiency; synergetic efficiency; criteria, factors, parameters of synergetic efficiency; digitalization, digital transformation, systemic dysfunction.*

I. INTRODUCTION

The digital economy is a system of economic relations based on the priority use of digital information and communication technologies, while the real economy is a system of economic relations operating within the framework of traditional technologies. The spread of the digital economy takes place under the influence of digital transformation processes, manifested in the formation of a new social and

economic order, the main link of which is knowledge and digital information and computer technologies. [1]

The technological drivers of the modern transformation stage are mobility, social networks, cloud computing, sensor networks and the Internet of things, artificial intelligence technologies for working with data. Together, this technology allows you to create "all smart": governments, houses, cities, business processes, health, transport, etc., revealing a new range of opportunities for business, consumers and society as a whole. [2]

History shows that the change of attitudes always has been accompany by a redistribution of markets, social wars, and protests against technological innovation. [3] This and currently there is a legitimate explanation. Thus, the main dividends from the digital economy is not receive yet by the society, but by IT-companies, primarily American ones.

However, the process of digital transformation on the one hand is irreversible, and therefore the division into digital and real economy seems to be conditional. On the other hand, for a number of objective reasons, the process of total digitalization of the economy and society as a whole is impossible. Therefore, it is most correct, in our opinion, to speak about the degree of digitalization of certain sectors of the economy and spheres of society. In this regard, with a high degree of conditionality, the economic system, which has undergone a digital transformation, can be represent as a triad "real economy-digital economy-society" with the interweaving of its elements.

The society, the real economy and the digital economy have interdependent influence on each other (both positive and negative) and in this triad influence the economic system as a whole. Having a General idea of what the digital economy and the real economy, we will define the contours of such a concept as "society" in this context. Under society, we will

understand society in all its multifaceted manifestations, the behavior of which is regulated by formal and informal institutions.

II. MATERIALS AND METHODS (MODEL)

In theory, the digital economy has a whole range of advantages associated with reducing costs (external, internal, transactional) and opening new sources of income, the ability to enter global markets, with a clearer response to market demands, with a more diverse information, educational, scientific, entertainment content. In fact, the digital economy is a model of the economy, which based on those opportunities that provide access to the Internet. Nevertheless, in different economic systems based on the same resources, the efficiency can be completely different, and the dynamics can be directly opposite. [4] A more healthy and educated society is easier to reap the full benefits of the digital economy and to gain their positive effects, than a society with lower levels of health and education of citizens, which is reflected by the gap of GDP from potential. Moreover, this is a real loss of wealth due to internal systemic dysfunction. [5]

In the framework of O. S. Sukharev's approach based on the theory of X-efficiency [6], the efficiency of the economic system means the possibility of detecting and using unused resources, the potential of which allows creating a subsurface product (income). Differently, taking into account all possibilities of the production and/or efficiency could be higher. We believe that in the context of digital transformation there should be just such an approach to determining the essence of efficiency – through the possibility of detecting and using additional resources. In addition, through the prism of this approach, the digital economy is not a goal, but a means to improve the efficiency of the economic system as a whole.

When analyzing the economic system from the point of view of the impact of its individual elements, it is appropriate to use the concept of systemic or synergetic efficiency, which is the overall efficiency of the economic system. All the structural elements of the economic system, as well as the processes taking place in it, are so closely interconnected that it is difficult to identify the causes, consequences and patterns. Synergistic economic efficiency allows the system to maintain viability and achieve successful operation. [7] But as with any system according to its characteristics, dynamic, and synergetic efficiency is sufficiently broad in amplitude from negative to as high as possible.

In our view, the theory of institutional dysfunction can be used to identify the reasons for the low level or lack of synergetic effectiveness. The analysis of functioning of modern economic systems in the conditions of digital transformation allows allocating the main spheres of possible emergence of institutional dysfunction.

III. RESULTS AND DISCUSSION

A. The first, most significant in depth and complexity, is the area of work. In the conditions of digitalization of economic relations, new specialties and professions appear. There is a rethinking of the concept of "high qualification", as the criteria of skilled work in the traditional definition is the

presence of higher or specialized education and the presence of professional experience, skills and abilities. However, in the digital economy, the ability to adapt permanently to learn new knowledge, skills and abilities is of particular importance.

These trends at first glance do not bear any negative burden, if not for the specific feature of the fourth industrial revolution in relation to the labor sphere. The gist of it is that it creates so many jobs in new industries. For example, in the US, only 0.5% are engaged in new industries that did not exist at the beginning of the century. Moreover, about 47% of US jobs may become automated in the next two decades and, as a result, the destruction of the relevant professions. [8]

The labor market will be characterized by a tendency of increasing polarization, the essence of which is that the intensification of employment will be characteristic of high-income cognitive and creative professions, as well as of low-income manual labor and its weakening for the average-income monotone standard professions.

According to studies by the Future of Jobs, published by the World Economic Forum, by 2020, "2 million jobs will be added to the world labor market, but 7.1 million will disappear... Jobs will appear in the intellectual and high-tech spheres, and will be reduced in the real sector of the economy... and the sphere of administrative work..."[9]

Modern digital business "burns" more and more in order to increase competitiveness. Such a business organization leads to a new structure of the economy, in which different forms of individual production and part-time employment play the main role. In this regard, a quarter of the population can become self-employed.

Also, the labor market will be seriously influenced by such a model of doing business as "economy on demand", the thesis of which is that at any time anywhere in the world the consumer can get what he wants. This model is transferred to the labor sphere. In this regard, the situation is fraught with the spread of unregulated virtual hard labor, the expansion of the class of workers earning from order to order and deprived of labor rights.

Such changes in the labor market are in line with the available human resources and education system and raise the question: what to do with people who have not found their place in the digital economy, since they lack creative potential, special social and communication skills, and cannot work in conditions of uncertainty and rapid changes. At the same time, in some sectors, the situation is changing slowly (higher education, mining and processing industry, construction); in others, faster (health, transport, consumer goods, the public sector, engineering, energy), but in some very quickly (banking, insurance, high technology, telecommunications, media, retail, sports and entertainment, defense-space). [10]

Thus, there is a certain "trap digital world of work", the result of which will be the emergence of a layer of so-called "digital marginal" - people who are not able for various reasons to adapt to digital social and labor conditions.

Increasing the number of unemployed will increasingly widen the gap between potential GDP and real GDP, reducing aggregate demand. On the one hand, companies caught up in a wave of digitalization will cut costs, but they will also have to

cut production due to lower demand. Thus, the impact of the digital transformation process on the labor market does not result in a positive synergetic effect.

The only compensatory mechanism is the development of core competence and ability for continuous learning, willingness to learn new knowledge on new emerging technologies constantly.

B. The Following area actively undergoing the process of digitalization is culture in its broad sense and education. Unfortunately, we have to admit that digital transformation takes place in a society where the value of knowledge and creativity is not cultivated, but a mass "qualified consumer" is brought up. Network information technologies significantly reduce the ability to critical analysis, understanding becomes superficial, emotions have no time for formation, reflection is almost impossible, and many things are assimilate unconsciously. There is a regime of clip consciousness that is easy to use for manipulative purposes

However, for every negative manifestation of information technology over time, a compensation mechanism will be develop, and the superficial perception of information will be compensate by the culture of authentication. At the same time, to become popular and popular it is necessary to be interesting for millions of different people, causing their emotional attachment. And through such people culture and new values will be broadcast.

Generations of children brought up in this direction will be interesting, honest and educated, possessing a high level of culture, without which it is simple not to be in the stream of digitalization. Every day the global network is update with new information about everything and everyone. Friends, acquaintances, employer and the state will form the reputation of each person. Direct and indirect sources of such information can be social networks, e - government services, data gadgets (phones and tablets), the transfer of business and any other activities in a virtual environment, etc.

In conditions of full information transparency, first, it becomes impossible to hide anything, and secondly, more importantly; it becomes impossible to lie, since any fact is easily verify. In such a society, the level of trust is very high. The high level of trust activates many processes in the economy, especially in the financial and credit sector, reduces transaction costs and increases efficiency. In this case, it is possible to say that there is a positive synergetic effect and, in General, a high level of synergetic efficiency for the economic system.

As for the education system, new technologies significantly change it. Colleges and universities offer online courses; online teachers offer new ways of learning teaching materials; the school regularly integrate tablet computers and other technology in the classroom.

Thus, education, science, research, culture and the media are key areas for the introduction of new digital advances and, in themselves, are critical factors contributing to the further development of digital technologies. This increases opportunities for learning, education, knowledge acquisition for a wide range of people. But this education is additional, as

a way to adapt to the current situation, as a way to more in-depth study of any individual issues. Individuals carry out basic education, in parallel with education: teachers, mentors, coaches, educators, academic supervisors, etc.

Prevention of total digitalization of the education system and preservation of the balance "traditional education-information education" will provide the necessary synergetic efficiency that positively affects the economic system as a whole.

C. The Third area, which in our opinion is no less subject to the processes of digital transformation, is the system of national security. National security includes a whole range of its constituent elements: information, economic, food, environmental, social, military security, etc.

Cybercrime is actively developing in the context of digitalization, and it poses the most serious threat to the financial sector, since mobile devices and financial mobile applications have already become part of the infrastructure of remote banking services. Smart contracts in organizations and companies that do not directly interact with money (like banks), but are nearby, and through which you can access large amounts are exposed to the threat.

Thus, despite all the advantages of digital technologies in the financial sphere, the threats are quite high, which does not allow getting a positive synergetic effect at the level of the economic system.

For fraudulent purposes, such a digital resource as cryptocurrency, which has the properties of anonymity of transactions, non-control by any regulators, the absence of any security and the inability to cancel the transaction, is also used. With the help of cryptocurrency, as a rule, it is bitcoin, make illegal transactions, evade taxes, and launder funds obtained by criminal means. The cryptocurrency can be used to Finance international terrorism. Thus, presenting the cryptocurrency as a threat to national security, the emphasis is place on its capabilities in the illegal sector of the economy. It is from these positions that cryptocurrency is a threat to national security.

However, from the financial and economic point of view, the cryptocurrency has certain economic effects that allow expanding the money supply. Consider at the expense of which cryptocurrency resources can improve the efficiency of economic relations. Complete anonymity, lack of control and the inability to leak information, the minimum Commission for transactions compared to the Commission of other means of payment, the speed of the transaction is a few minutes, while Bank transfers between countries can take up to several days.

IV. CONCLUSION

The review makes it possible to draw the following conclusions:

A. In modern conditions of digital transformation, there is a formation of the new socioeconomic way based on digital technologies. The formation of the digital economy does not mean the total spread of new forms to the entire economic system. In fact, it is a question of a greater or lesser degree of dissemination of digital technologies to certain industries. But

the digital economy is not a goal, but a means of operating the economic system in a changing environment. At the same time, her influence can be opposite.

To identify the positive or negative impact of the digital economy on the functioning of the economic system, the most appropriate approach is to determine the effectiveness. This approach assumes that efficiency is not a traditional correlation of results and costs, but an opportunity to detect and maximize the use of all available resources in order to have a favorable impact on the functioning of the economic system. From this perspective, the effectiveness of the entire economic system, changing due to the impact of elements of the digital economy, or synergetic efficiency, is of interest.

B. Having Considered the areas of social and economic life, the most prone to digital transformation, we note that in the labor sphere, the impact of the digital economy is ambiguous due to the fact that the automation of jobs, and the number of newly emerging professions at times less than disappearing. A new approach to the definition of high qualification as the ability adapt to new conditions constantly is being formed, and the information business, as much as possible eliminating possible costs, produces new forms of part-time employment and self-employment. In this regard, the decline in the level of employment can only adversely affect the functioning of the entire economy.

In the sphere of culture in its broad sense the impact of the digital economy brings to greater extent positive effects. It forms a new image of honest, highly cultured and charismatic professionals. A high level of culture increases the level of trust in the society, reduces transaction costs and activates many economic processes, and, as a result, positive synergetic efficiency. With regard to education, there is a need to strike a balance between traditional and information education, where basic education is built primarily on traditional forms of communication and additional or higher levels of qualification on digital technology.

In matters of national security, digital transformations involve a whole range of threats. Nevertheless, these threats are largely not from the economic plane. Ambiguous effects for national security and as a consequence for the entire economic system are associated with the circulation of cryptocurrency. The institutionalization of crypto-space is necessary to produce positive synergetic effects.

Thus, the paper presents an attempt to develop the contours of the conceptual approach to determine the synergetic efficiency in the digital transformation of society and economy.

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References

- [1] Introduction to the "Digital" Economy [Vvedenie v «Cifrovuju» jekonomiku] / A.V. Keshelava V.G. Budanov, V.Yu. Rummyantsev and others; under the Society. Ed. A.V. Keshelava - VNIgeosystem, 2017. - 28 p.
- [2] Khokhlov Yu.E. The debate on the report of the «digital economy. Industry 4.0 as a Business» [Diskussija po dokladu «Cifrovaja jekonomika. Industrija 4.0 kak biznes] / Scientific seminar on digital economy // Institute of the Information Society. - Moscow, Moscow State University. M.V. Lomonosov Moscow State University, Faculty of Economics, December 20, 2017
- [3] Schwab K. The Fourth Industrial Revolution— «Eksmo», 2016 — (Top Business Awards)
- [4] Sukharev OS Theory of economic efficiency: organizational, institutional and system perspective of the problem [Teorija jeffektivnosti jekonomiki: organizacionnyj, institucional'nyj i sistemnyj rakurs problem] // Экономика и предпринимательство Economics and Entrepreneurship [Jekonomika i predprinimatel'stvo] 2010. № 6 (17). pp. 5-17.
- [5] Leibenstein H. General X-efficiency theory and economic development. N.Y. etc.: Oxford Un. Press, 1978.
- [6] Sukharev OS The theory of effectiveness of economy [Teorija jeffektivnosti jekonomiki] / Moscow, 2014.
- [7] The world is changing. Here's how companies must adapt <https://www.weforum.org/agenda/archive/fourth-industrial-revolution>
- [8] Podcast: Regulation for the Fourth Industrial Revolution <https://www.weforum.org/agenda/archive/fourth-industrial-revolution>
- [9] Klaus Schwab, The Fourth Industrial Revolution: what it means, how to respond // <https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/>
- [10] Mapping Global Transformations / Fourth Industrial Revolution <https://toplink.weforum.org/knowledge/insight/>
- [11] How the growth of the Crypto-currency helps the world economy [Kak rost kriptovaljut pomogaet mirovoj jekonomike]
- [12] Can blockchain serve business, people and the planet? <https://www.weforum.org/agenda/archive/fourth-industrial-revolution>