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ECONOMICS DIGITALIZATION AS A BASE FOR CHANGING THE GLOBALIZATION MODEL: TRENDS AND CHALLENGES

The article proves that globalization is a product of the evolution of state-designed market systems at the stage of transition of the system from the stage of maturity to the stage of regressive transformations. This product resolves the contradictions arising in the stage of the maturity of the market system. Globalization, growing out of the evolution of market systems, is transforming the international economy. The ultimate point of globalization is the formation of a single network of the world economy – geo-economics. But the model of movement to the endpoint itself is undergoing transformation in the first quarter of the twenty-first century. The basis of this transformation is the digital economy, which fundamentally changes not only the trends of globalization, but also creates new challenges for humanity.

Key words: globalization, digitalization, evolution of market system, globalization model, flows of data and information, digital economy, internet economy, business ecosystem, Industry 4.0, fourth industrial revolution, market of software product.

Introduction. The world is moving step by step towards the digital economy. The digital economy is changing not only the "interface" of the economy, but also its essence. If the emergence of a market economy in Western Europe in the Middle Ages "moved" from local markets to a nationwide one, the process of globalization moved from national companies through transnationalization to international companies. As a result of the latter's processes, a network model of the world economy was formed, which entailed significant changes in the markets, including labor market.

And the very globalization of the world economy was able to develop only thanks to the development of information and telecommunications technologies that underlie the integration of markets and production systems.

Today, to understand the trends and patterns of the world economy, globalization and the role of digitalization in them, it is necessary to consider trends and patterns of development of market systems. Refusal of the evolutionary analysis is fraught with misunderstanding of many processes of globalization and its consequences in the formation of geo-economics and the place of digitalization in it.

Unclear in this case, the problem remains: what impact does the digitalization of the economy have on the processes of globalization? Does it strengthen (reinforces) or, on the contrary, deny what processes occur in the production on the basis of digitalization, how do they affect the availability of jobs, how the market will change, what challenges prepares digitalization for the world economy and for all of us.

We will try to prove that globalization "grows" from the evolution of the market system. It is a product of its evolution. Its ultimate goal is to form a single global economy – geo-economics. In the context of digitalization, the model of market globalization is changing dramatically – geo-economics is formed, but the interface of globalization is not a production globalization, but a consumer one. The dominant market in the near future will be the software product market. Small farms focused on the needs of the local market, rather than large transnational corporations will dominate. But so far, the dominant companies (in terms of growth rates) are transnational corporations associated with the digital economy, which either did not exist 10 years ago, or they were not in the Top 25. All these processes put forward new challenges for humanity: reduction of jobs and narrowing of the labor market, the extinction of the middle class, which is the backbone of the state political system, approaching of point of technological singularity, which will no longer require the existence of human beings in the form of labor as a factor of production and denial of market production as it has evolved over many hundreds of years.

The theoretical and methodological basis of the study is determined by a systematic approach. The authors believe that the economic system is a varieties (kind) of systems. And the regularities of the latter are invariants of economic systems. In the course of the research the methods combining of logical and historical, deduction and induction were used. The paper there were also used other methods of scientific and economic analysis: calculation and analytical method,

comparison, balance method, groupings method, modeling [1].

Main part. We live in globalization epoch. Global economy did not arise from scratch. It is a product of the evolution of state-designed market systems and the process of globalization. According to A. J. Toynbee, O. A. Spengler, A. N. Averyanov [2] development (evolution) is the path that takes the system from the moment of its occurrence. The evolution is the path that the system passes from its inception. The development (evolution) includes a number of points (stages, phases): emergence, formation (becoming), the period of maturity, regressive transformations, disappearance, each of which is characterized by specific features. Any system passes these stages. Market system is not an exception.

The market system is a variety (kind) of system. And the exchange underlying the market is a "cell" from which the market system is built and grows. Just like building material of the human body is a "cell", the building material of the market system is an "exchange".

In this case, the criterion basis for the analysis of the economic system is the coordination of economic activity among economic entities, i.e. exchange. Exchange is a characteristic feature of universal market and market system, which is a "unit" of the system, allowing to distinguish the latter from the world of other systems. The market is an exchange, "locked on self", causing free fluctuation of demand, supply and prices, orienting production to meet the needs. It occurs then there, at the time and insofar as, where and when the exchange is becoming a constant based on the specialization of the producer, information for which is the fluctuation of demand, supply and prices. The emergence and establishment of the market can be qualified as the moment, the final stage of the emergence of the market system and its entry into the period of formation, when the system begins to grow and expand. If the emergence of sporadic exchange is the negation of the previous form of the movement of matter – subsistence farming, then the emergence of the market is not just a break from the old but a breakthrough to a new one. From it, from the market, and begins the emergence of a new essence – the negation of the old form of the motion of matter. At the same time, we note that subsistence economy is still a medium, in which a new market system emerges, although it is constantly tapering. The latter (market system) is a kind (variety) of systems, and is a combination of economic entities and institutional forms of their functioning. The motivational basis for making decisions and their implementation by business entities is private property and law; integration and information basis – free fluctuation of demand, supply and prices; organizational basis – commodity production.

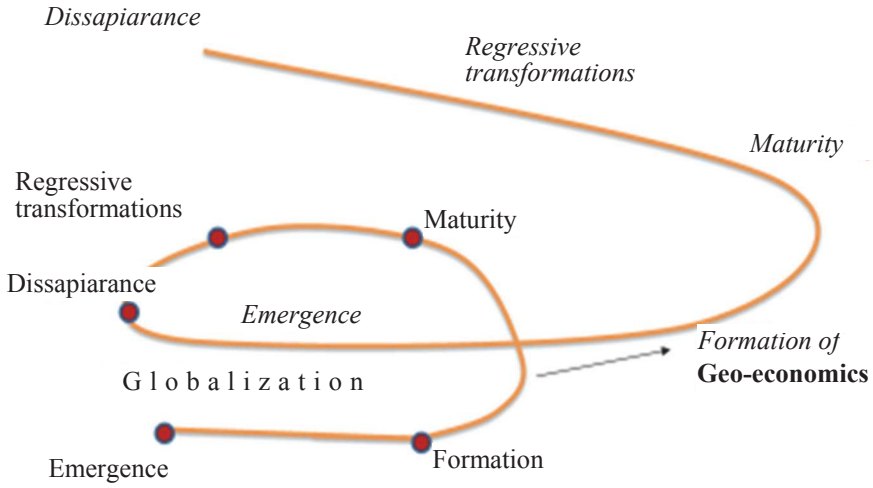
At the stage of formation (becoming) the system is growing, i.e. more and more products are involved in the objects of purchase and sale. There is not only a product differentiation, but also a functional differentiation. There is a market infrastructure – exchanges, banks, insurance companies, trade fleet, etc. There is their specialization. If the stage of emergence is finished, according to the studies of historians, around the twelfth century (in the West Europe) [3], the stage of formation continued until the end of the nineteenth century. In this case, we are talking about the market system and its evolution as a product of Western civilization.

At the stage of maturity, any system begins to leave the state of dynamic equilibrium and, accordingly, requires the tuning mechanism. The nonequilibrium states of the system require its adjustment (setting). In the market system at a certain stage (for the first time at the end of the nineteenth century) such adjusting mechanism as states (government) regulation began to act. It was resolving all the contradictions of the system throughout the twentieth century. We should note that in this case we are talking about the evolution of state-designed market systems.

Thus, market state-designed systems in their development has gone through three stages – emergence (market), formation, becoming (market economy), maturity (a market economy type). Starting to form the elements of a higher industrial system*, preparing the fourth stage of development of the system – regressive transformations, which is called "market-industrial" in state-designed frameworks, the market system resolves all the contradictions due to its expansion. There were market economies as the state-designed or otherwise, "existing within the state". The state was a framework for a market economy [4].

Then it goes beyond the borders of national framework, returning to the stage of the emergence of market systems, but on a qualitatively new level – the world market economy is forming, where there is a return to the starting point. This is a new spiral (helix) in evolutionary development (see figure below).

* The term "industrial" means the transition to strict coordination, to the fixation of relations between economic entities. It means the denial of fluctuating prices, supply and demand.



The evolution of national market systems

Here, on a new turn, at a new stage, some aspects and moments of the initial state – the market economy – has been repeated. But if in the first case the market (the stage of emergence), had involved households, formed a national market economy, in the second case, in modern conditions, the formation and development of the world market system causes the involvement of national economies as a whole. The difference is that if in the first case the household was separated from the production unit, in the second case, transnational corporations are separated from national economy, as well as the formation of special territories (border zones, special economic zones, etc.), that is so-called "external economies" [5].

If more recently, the world economy was defined as a set of national economies connected with each other by a system of international division of labor, economic and political relations, today this definition undergoes significant changes. For the world economy is being formed as a single networked global system – geo-economics, in which not every participant in the world economy can become an entity. Especially, in the proposed model, on which the formation of geo-economics has gone, the state loses its sovereignty.

This is geo-economics, a product of the evolution of national market economies in framework the state and the final result of globalization of the world economy, which at the present stage formed global players – actors [6]. As a part of the maturity stage of the market system, when a market-type economy was formed (since the late of the nineteenth century), globalization started. Globalization is the process of drawing the world economy into the market and market relations and creating a unified world network economy – geo-economics. More recently, the world economy was understood as a combination of national economies linked by the world division of labor, economic and political relations. As the result of this "of being drawn" some parts of national, "internal" economies are transformed into "external" ones via *transnational corporations (TNC), regional groupings, special economic and frontier zones, and bilateral agreements on free trade* [5]. The ultimate goal of this globalization process is the creation of a single global network market economy – geo-economics. Geo-economics is a single global networked economy, operating as a single organism. Key factor in its development – TNCs, MNEs (see figure above).

But there are the questions to pay attention to: where and how evolution moves, what are its drivers, what elements will deny this system?

Based on the market paradigm, the negative element could be a contract fixing relationships and denying a fluctuating price (one of the main signs of market availability).

But the denial "has gone" in a different direction – the sellers and buyers themselves are denied in the form in which they functioned and still function – TNCs, MNCs, etc. And then the exchange itself will be denied.

Two macro factors underlie the trend toward greater globalization: the first is decline in barriers to free flow of goods, services, and capital that has occurred since the end of the World War II. The second factor is technological breakthrough, particularly dramatic achievements and inventions with made in recent years in communication, information processing, and transportation technologies [7].

Moreover, all these processes took place in the framework of the *second* and *third technological (industrial) revolution*.

The main feature of the *first industrial revolution* was industrialization – transition from

a predominantly agrarian economy to industrial production, which resulted in the transformation of agricultural society into an industrial one (the second half of the eighteenth – nineteenth century).

The *second industrial revolution* means a transformation in world industry, spanning the second half of the nineteenth and early twentieth centuries. The beginning of it is the introduction of Bessemer steelmaking method in the 1860s, and the culmination point is shift towards production and production lines, automated production.

The dominant sector is the secondary sector-industry.

The *third industrial revolution*, sometimes called the digital revolution, refers to changes that occurred in the end of the twentieth century with transition from analogue electronic and mechanical devices to digital technologies.

The dominant (in GDP terms) is the tertiary sector – the service sector.

The digital economy reflects the shift from the *third industrial* revolution to the *fourth industrial revolution*. The *fourth industrial* revolution builds on the digital revolution as technologies today continue to bridge the physical and cyber worlds [8].

The transition of the market system to a higher level of evolution – the world market system through the processes of globalization-required strong communication links. The global world economic system – geo-economics cannot exist without strong logistics and communications. They are the main prerequisites for the cross-border movement of goods and capital. If in 1980 the share of cross-border movement of goods, finances, services in GDP terms was only 26%, in 2007 it amounted to 53%(!). Then in 2014 this share was 30%. These figures seem to indicate that the processes of globalization, despite the growth in relation to 1980, still continues decline. In other words, globalization is slowing down. However, despite the fact that global merchandise trade has dropped and cross-border capital flows have declined sharply since 2008, globalization is not moving in the opposite direction. Rather, it enters a new phase, defined by a sharp increase in the flow of data and information.

In this case, we should talk about the introduction of globalization in a new phase – formation of a digital economy. If in the twentieth century the processes of globalization were characterized by the movement of material flows of physical goods and services across borders, then in the twenty first century, cross-border information flows increase of. For the period 2005–2014, the cross-border capacity of information flows in the world, measured in thousands of gigabits per second, increased by 47 times – from 4.7 to 211.3.

If in the twentieth century the transport structure was critically important for the flow of goods, logistics systems were important, then in the twenty-first century the digital infrastructure becomes not only less important, but every year become more and more significant.

If in the twentieth century flows of goods, services, finance were channeled by TNCs, MNCs now the role of small and medium-sized enterprises and even individual freelancers enhanced greatly.

The globalization model of the twentieth century presupposed the domination of capital-intensive and labor-intensive flows. Moreover, the periodization of globalization has always been determined by the presence and growth of these flows in the structure of GDP.

Now the picture has changed – intangible flows of data and information and knowledge-intensive flows in general dominate [9].

Thus, the globalization model has changed dramatically in recent years. Globalization is becoming more and more digital. Accordingly, the effects of the processes of globalization are changing. If in the twentieth century the main problem was the problem of promoting business abroad, it was important to transform business into international business through the creation of branches, etc., in modern conditions, in the conditions of digitalization, participation of countries in globalization is increasing without cross-border transfer of goods and services, production.

If in the twentieth century business, moving across borders, formed the demand for products and the globalization of production prevailed, then in the current conditions of the twenty-first century, globalization of consumption prevails. The following data testify to these processes. If in 2014 the volume of cross-border e-commerce was 15% of the total volume of transactions, then by 2020 it is expected to grow to 29%. At the same time, the dynamics of the share of buyers through e-commerce will increase from 23% in 2014 to 45% in 2020.

Existing digital platforms connect billions of people around the world. For example, Facebook – the largest digital platform connects 1.6 billion people, Youtube – 1 billion.

Today, production in foreign markets is directed by TNCs. And tomorrow, based on digital technologies, production, using software products and 3D printing, will approach to consumer and "consumer will become producer". In the conditions of digitalization, processes are already undergoing radical transformation of the landscape of geo-economics. What is the manifestation of this?

Transformation of the economy from analogue to digital is not only the automation of production processes. It's not even informatization of the economy. The process of digitalization of the economy and its transformation into the digital economy means the use of quantum and neurotechnologies, robotics and digital technologies themselves. The penetration of these technologies into all spheres of human life, including production. All these technologies provide large-scale cross-industry effects, changing the picture of the production itself – from large-scale production to small so-called farms that will be targeted to the consumer in the regions. In this regard, the main markets will not be product markets, or even technology markets, but markets for software products that will allow the production of certain goods by consumers themselves.

There is a "withering away" of the mediators. If the emergence of intermediaries in the Middle Ages indicated the development of the market system, its dynamics, then in the modern world, the reverse process occures the reduction of intermediaries, and indicates the development of the system. Today it touched the banks. Interrelations are becoming personalized (first the intermediaries are deleted, then, in the long term, the corporations themselves).

Digitalization changes business models – it becomes transparent, open, moves toward a flat organization, toward various forms of sourcing. Its existence on digital platforms sharply lowers the cost of goods and increases the turnover of capital. Business can exist only in networks – there is no other way to survive.

As for the labor market, there are also fundamental changes. There is a gap between highly technological skilled workforce and low-skilled workforce. And it will increase. High-tech employees with creative thinking will have much of the wealth, because their wages will be much higher than wages of non-high-tech workers has been connected with difficult operations that robots can perform.

Nuriel Roubini noted at the International Forum "Hi-Tech Nation" in Minsk (2018) the following: "In the conditions of globalization, when the market consists not of millions but of billions of people, the principle 'the winner gets everything' works for the top representatives. The best lawyers, the best investment bankers, the best sportsmen, the best rock stars, the best economists, the best journalists, the best gurus, etc. – they get all the benefits of the entire multi-billion dollar market. Those who are in 10% or 20% of the best specialists in their field. While everyone else in this pyramid receives much less". Under these conditions, the middle class is eroding. In the long term, he will not exist at all. Accordingly, political instability will grow as the middle class is the backbone of political system [5].

According to the Report of the McKinsey Institute (February 2016), the world is entering a digital era, replacing the *third industrial revolution* with the *fourth* [10]. The business environment is changing. In the era of the *third industrial revolution*, the entities of the business environment required a transition from a vertical to a flat (horizontal) model of business organization, as well as appropriate management tools, the fourth "breaks" the existing understanding of the business environment, the business ecosystem of economic entities and, accordingly, requires new management tools, new organization forms such as clusters [11]. New business ecosystem is created as a result of transition to the *fourth industrial revolution*.

What's going on in the world? Why does the business environment today require changes in management tools? What challenges does the world economy and national economies face in these conditions? This, seemingly purely theoretical formulation of the question, is becoming more pragmatic than ever. Why? Because from the solution of problems, the generated challenges, the mankind can prepare answers to these challenges in due time. Because from the timely and adequate transformation of management tools depends on the effectiveness of decision-making in companies, and accordingly their development.

As the above-mentioned Report stresses: "Conventional wisdom says that globalization has stalled. But although the global goods trade has flattened and cross-border capital flows have declined sharply since 2008, globalization is not heading into reverse. Rather, it is entering a new phase defined by soaring flows of data and information" [10]. It's really true! Statistics show that the total cross-border throughput used in thousands of gigabits per second rose from 4.7 (2005) to over 211 (2014) gigabits per second. For the same period the trade in goods had been declining since its post-recession period: from 26.6% (2011) in GDP to 24.6% (2014). Of course, this is not a hard trend, because the trend cannot be seen in such a short period, but the trends are outlined.

Ten years ago, banks and energy companies dominated the Top 10. Today, these are technology companies, with US computer company Apple in the number one spot. In 2006, according to Bloomberg, 10 of the world's largest companies were as follows: Exxon Mobil, General Electric, Gasprom, Micrformsoft, City Group, Bank of America, Royal Dutch Shell, BP, PetroChina, HSBC. In 2016, according to Bloomberg again, 10 of the world's largest companies became Apple, Alphabet, Microsoft,

Berkshire Hathway, Exxon Mobil, Amazon, Facebook, Johnson & Johnson, General Electric, China Mobil. Half of them (2016) are connected digital platforms.

In the first ranking of its kind, UNCTAD Report, WIR 2017 shows that three countries hosted up to 75% of the top 100 digital multinationals. What did not exist in 2007? Instagram, Uber and 30 of the top 100 digital multinationals. Digital MNEs make about 70% of their sales abroad, with only 40% of their assets based outside home countries. This results in the creation of fewer jobs directly in host countries. However, investments from digital MNEs can increase competitiveness and contribute to digital development [12].

The WIR 2017 also lists the top 100 global MNEs, and shows that between 2010 and 2015, the number of technology companies doubled or even more. The assets of such companies increased by 65%, and their revenues and employees amount increased by about 30%, against flat trends for other multinationals in the top 100 [12].

This concentration is more vivid among Internet platforms: 10 out of 11 major digital multinationals in the ranking are from the United States.

A lot of companies position themselves as digital ones. For example, Shell – first company in ranking WIR, 2017. Shell spends about 1 billion dollars annually on research and development, and while part of that figure goes into hard research such as molecular compounds, a greater portion of that investment has been allocated to knowledge and data.

It should be borne in mind that the Internet economy (IE) is not equal to the digital economy (DE). IE – there is only a beginning, only part of the last (DE). The Internet economy facilitates interaction between business actors. Accelerates the process of turnover of resources, income and profit growth. In connection with it there are four fundamental directions of digital transformation, which are central to changes in business in the digital economy.

1. Business ecosystem changes – transition to flexible forms of hiring, management, organization of production as a whole.

2. According to some experts, by 2030 the average middle class will increase threefold. Thus, pressure is exerted on the main business resources, which is growing at a slower rate by 1.5 times. Digitization of everything creates new intelligent digital networks of networks that radically change the ways of managing, optimizing, sharing and deploying trade.

3. In the digital economy, all customers – (within B2B, B2C, P2P loans, P2B loans) – want to interact with enterprises in the most convenient way for them [13]. Customers are seeking to interact with brands. Interaction becomes seamless, universal, direct and personalized. Without intermediary firms.

4. Nowadays everything can be connected – people, businesses, devices and processes. With each other. The combination of the physical and digital world brings all assets into a digital domain, where software dominates. In the near future, not products and technologies will dominate, but software products.

In this regard, it is advisable to recall the words of Nicholas Negroponte, which most fully reveal the essence of the impending digital economy. "The problem is simple. When information is embodied in atoms, there is a need for all sorts of industrial-age means and huge corporations for delivery. But suddenly, when the focus shifts to bits, the tradetional big guys are no longer needed" – Nicholas Negroponte pointed [15]. These seemingly simple words overturn the understanding of the business environment, business prospects and the tools used in management. Moreover, "big guys are no longer needed" i.e. MNE will not play such important role in world economy any more in the form in which they exist today. They are transforming as well as Shell.

Thus the *fourth industrial revolution* (or Industry 4.0) is the current and evolving environment in which disruptive technologies and trends, such as the Internet of things (IoT), robotics, virtual reality (VR) and artificial intelligence (AI), change lifestyles and production [13].

The digital economy goes far beyond digitization and automation. The *fourth industrial revolution* (Industry 4.0) is transition to fully automated digital production, managed intellectual support in real time in constant interaction with external environment, with subsequent integration into global industrial network of things and services. In a broad sense, Industry 4.0 characterizes the current trend in the development of automation and data exchange, which includes cyber physical systems, the Internet of things (IoT) and cloud computing. It represents a new level of organization of production and management in the value chain throughout the product life cycle and is associated with 4D technology. The term 4D began to be used to refer to a special technology of printing objects that change their characteristics over time. Thus, in 4D printing, the "fourth" is not a dimension but a parameter, which is associated with the position (possibly, with a function) of the object. Today, the economy is turning from a traditional analog market economics into a digital one!

Conclusion. So what are the trends of this movement under the influence of these technologies?

1. The globalization model will be completely transformed – from huge TNCs and MNCs to small

farms located in the regions, and focused on the needs of customers.

2. The intermediators will be deleted, the relationship will be "seamless". In this context, marketing tools will undergo transformation. To meet the "demand" and "supply" will only need digital platforms, where they will stack. This reality already exists today. But this is the first step. In the near future (10–20 years) in connection with the revolution in biotechnology, production will be directly transferred to the consumer. Production in its modern sense will not exist. Manufacturers will be eliminated. Thus, the evolution of market systems returns to the starting point – the subsistence economy. Only at another technologically higher level. In this case, the evolution of market systems is changing. It moves, as if the opposite. If at the first stage the market emerged from subsistence economy, then at the second stage the market system began to develop and expand due to the appearance of intermediaries and differentiation of the functions of the entities of the market system (actors). This was the classical evolution of market state-designed systems in the Western Europe. The first two stages took place in the Middle Ages. In the present conditions, intermediaries, and then the producers themselves, are eliminated from the system. But that will be long way (around 50 years).

3. Globalization has not finish yet, it has become different. If recently the driving force of globalization was MNEs, now their driver is the Internet and the digital technology.

4. The main content of the new stage is the transition from globalization of production to globalization of consumption.

5. In the future, with the development of 3D printing, production in our understanding will disappear. Everyone can produce any product using a 3D printer – from food to transportation. Thus, the picture of production is changing fundamentally. As the prices of sensor devices continue to drop, mankind enters a new phase of development, where everything can be interconnected – people, businesses, devices and processes. The combination of the physical and digital world brings all assets into a digital domain, where software will dominate, the so-called, Internet of things. If in the conditions of a market economy it was a question of the markets of various goods, then tomorrow the market of the software product becomes the main market. And all assets accordingly will move there.

6. The "rules of game" for business are changing, common economic spaces will be gradually formed without participation of supranational formal institutions and, in a much longer term, a world without classical economic borders.

7. People are being moved away from production, which through 4D technology moves from global production, through regional to individual one.

What are the main challenges for the mankind in this situation?

1. The reduction of jobs and the narrowing of the labor market.

2. The disappearance of the middle class, which is the backbone of the state's political system and growing political instability. A state as political institute is facing of new challenge.

3. An approach to the point of technological singularity that will no longer require the existence of man as a factor of production and denial of market production in the form it (the latter) has existed for many hundreds of years.

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