

The interaction of the real and digital sectors of economy

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Abstract

The article is aimed at identifying the basic theoretical fundamentals for building interaction of the real and digital economic sectors. The leading method for studying this problem is consideration of the processes of interaction between the real and digital sectors of the economy in close interconnection at different time periods. As a result, the modifications in digital technologies of economic interaction outrun the transformation of the humans who use it in casual activities. In conclusion, activation is a significant non-material factor affecting the integrity of the economy and affecting the quantitative and qualitative characteristics of the socio-economic development of territories.

Keywords: Digital Economy, Interaction Design, Interpenetration.

La interacción de los sectores reales y digitales de la economía

Resumen

El objetivo del artículo es identificar los fundamentos teóricos básicos para construir la interacción de los sectores económicos reales y digitales. El método principal para estudiar este problema es la consideración de los procesos de interacción entre los sectores reales y digitales de la economía en una estrecha interconexión en diferentes períodos de tiempo. Como resultado, las modificaciones en las tecnologías digitales de interacción económica superan la transformación de los humanos que lo utilizan en actividades informales. En conclusión, la activación es un factor no material importante que afecta la integridad de la economía y afecta las características cuantitativas y cualitativas del desarrollo socioeconómico de los territorios.

Palabras clave: Economía digital, Diseño de interacción, Interpenetración.

1. Introduction

The relevance of the materials in this article is due to the fact that in the electronic computer environment, the relationship between the interaction of the real and virtual sectors of the economy, bringing high profits to participants in this process and fixing new, not always adequate rules for their financial distribution began to be formed. Mechanisms for regulating these relations have not yet been found, and the receipt of associated profits is accompanied by new risks, both for the physical participants of this process and for the state, requiring a scientific search for adequate protection measures. There is no common opinion of scientists and experts on the key issues of nature and interaction of the two sectors of the economy. The virtual, digital sector is represented in the electronic environment as an aggregate of socio-economic relations based on the usage of digital information and communication technologies. It functions despite of some authors believe that this sector cannot exist in a real economy while others are of the opinion that it can, explaining this by the fact that the virtual and real economy complement each other, speeding up the processes of interaction between people, citizens and states and therefore the virtual economy, for example in the form of electronic money, is contained in the real sector, while the real economy is intertwined with the virtual one.

Such problems as the emerging trends within each of these sectors of the economy and their interaction are of interest to scientists from various countries. They try to understand its essence and significance for society expressing their views in scientific publications. According to experienced experts, the number of similar problems will increase, and the urgency of the solutions will increase, as the competitiveness of companies will largely be determined by the level of the digitization. There is a clear possibility of realizing the assumption that integrated (virtual - real) market entities will dominate in the economic relations of the near future, with approximately equal importance of both virtual and real components for generating high profits and other final results. It is largely due to the fact that the rapidly developing Internet information is actively built into the material production and the sphere of commodity-monetary relations, since only there it becomes the most productive. At the same time the behavior of the virtual and real sectors of the economy in the virtual space, as well as the processes and results of the convergence, have not been sufficiently studied so far and requires researchers to find acceptable models for building business relations in the electronic environment.

Scientific understanding of the changing nature of the real and virtual sectors of the economy, the interests of its penetration into the electronic environment, the motives behind as well as the financial mechanisms and results of the interaction is appropriate in order to generalize the achievements in this area, expand the scope of representations about it and practical applications. Moreover, there is a necessity to scientifically understand the scale of emerging contradictions between business, society, the state and public sectors of the economy, including its negative impact

on changes in the volume and structure of GDP (Gross domestic product). New trends in the manifestation of the results of the functioning of the virtual sector of the economy have already emerged in developed countries. For instance, digital sector begins to outstrip the real economy by its specific gravity in GDP imposing a scientific approach to prioritizing and selecting mechanisms for regulating the development of each of these sectors. Since the interaction of the real and virtual sectors of the economy is accelerating, another urgent task is to ensure the outstripping development of the legal framework that determines the conditions for such interaction. Developing the regulations on interaction based on the search for a compromise in achieving a balance of interests of the participants in the interaction process is appropriate at the initial stage.

An improvement of the processes of interaction between the real and virtual sectors of the economy in the digital environment is an urgent task, the solution of which is devoted to the materials of this article. The aim of the article is to identify theoretical and applied problems of interaction between the real and digital sectors of the economy and to develop scientific and practical recommendations. This goal is achieved by solving the following specific tasks – identification of the interaction of two sectors of the economy as a specific type of business culture, influencing the formation of business traditions and the life standards of the population; evaluation of the interaction between two sectors of the economy and its influence on the individual's consciousness, worldview, social behavior; determination of the general level of development of the phenomena and referring it to the corresponding stage of the formation; identification and expansion of mechanisms for solving the problems of development for new forms of interaction, commodity-monetary relations, factors of production, motivation, regulation, institutional fixing, infrastructure support, evaluation of positive and negative results.

2. Materials and Methods (Материалы и методы)

The leading method for studying this problem is consideration of the processes of interaction between the real and digital sectors of the economy in close interconnection at different time periods and space taking into account the influence of external factors of globalization and the integration of the global system in the real and digital space of life. This method allows consideration of the interaction of the real and virtual sectors of the economy in a complex way and revealing the correct civilizational solution. At the same time, the article presents, compares and analyzes different points of view of scientists and practitioners regarding the concept of virtual and real in the theoretical aspect. From the one side, the digital cannot exist in the real. From the other side the virtual and the real complement each other, speeding up the processes of interaction between people and state. The article uses methods of comparative analysis of statistical information, big data, statistical data obtained in different countries, characterizing the digital economy and comparable to each other.

3. Results

1. Modern economic systems of different levels and scales pass the period of development which can be called the stage of the formation of relations between the interaction of the real and digital sectors of the economy.

2. Basing on the interaction of the real and virtual sectors of the economy a new specific type of business culture is formed in society with its inherent laws, rules, traditions that affect the living standards of the population.
3. Digital technologies of interaction demonstrate the intellectual and innovative power of the countries, affect the consciousness of an individual, the vision, social behavior, attitude to the institutions of power and can indirectly affect national values and traditions.
4. The development of new forms of interaction between two economic sectors is a consequence of the growth of profits, the acquisition of digital world attributes of the real world and the need for the real economy to expand its capabilities.
5. The modifications in digital technologies of economic interaction outrun the transformation of the humans who use it in casual activities and make it obligatory to overcome this gap.
6. The interaction of the real and digital sectors of the economy is carried out on the basis of commodity-monetary relations which differ from the classical ones.
7. Digital technologies in a virtual economy act as the primary and secondary factors of the production process creating the information product, services or other goods that have both an immaterial and material embodiment.
8. An innovative content of institutional, information and technological infrastructure is needed for the interaction between the real and digital sectors of the economy.
9. The interaction of the real and digital sectors of the economy should be regulated by international legislation which establishes the basic rules, definitions and principles of behavior for all its participants.
10. There are positive and negative results of the interaction between the real and digital sectors of the economy expressed in the complementation of each other with new opportunities and the emergence of new risks.

4. Discussion

4.1. The nature of the digital economy and its interaction.

Modern world practice shows that virtual, digital technologies of augmented reality have an extraordinary impact on the real sector of the economy. A convincing proof is real practice but it is not supported yet by sufficient theoretical justifications. Traditionally the production process is carried out under the influence of material and non-material factors of production. Material factors of production are represented by land (forests, minerals and oil deposits, water resources), labor and capital. Land and labor are the main primary factors of production which exist independently of the economic system. Capital (in the form of fixed assets) is a secondary factor of products produced in the economic system by the interaction of labor and natural resources. Considering labor as the mental abilities of people employed in the production industry, digital technologies can be perceived as the primary factors of production since specialists invest their intellect in the production process. Bearing in mind capital (in the form of fixed assets) digital technologies are means of production, resources for the creation of a specific product, the profit of the organization and act as a secondary factor of production. Acting as an information component of production digital technologies might be considered as an intangible factor. It should be noted that information is not the only factor of non-material production. There are many other virtual factors which are invisible that creates the impression of its absence. However, they exist and become more active in terms of the degree of impact on the reproduction process. For instance new knowledge, ideas,

modern values of corporate culture, management philosophy to which the forms, methods and content of the economic relations of the production process are adapted.

Summing up digital technologies act as primary and secondary factors of production on the basis of which a product can be created in the form of information, services or other goods in both intangible and tangible embodiment. The usage of digital technologies as a factor of production skillfully connected with other factors by entrepreneurs will bring a considerable profit. The return directly depends on the quality of the technology itself and on the entrepreneurial ability of its integration into applications. The research of the degree of mutual influence on the functioning of the economic system as a whole is equally important along with the theoretical understanding of the usage of digital technologies in production. In accordance with the trends of globalization, the emergence of the digital or virtual sectors of the economy as well as the development of its interaction with the economic system is subordinated with the interests of transnational corporations, international banks and enhances the activity of cross-border capital flows. The further penetration of digital technologies into life is one of the features of the future world, caused by progress in the fields of microelectronics, information and communication technologies due to the toughening of competition for the energy and intellectual resources of states.

Digital technologies change the possibilities of managing the economy but also affect the individuals. Often newly created digital technologies outstrip a person's willingness to use it. The studies show there is no strict straightforward correlation. Authors consider this thesis on a real example. The increased capabilities of computer technology lead to the active dissemination of neural network data processing. Today neural networks are the modern tool for data analysis. Data processing is done on this basis using software products designed for forecasts (prediction of markets, non-repayment of loans, bankruptcies, prediction of the consequences of certain decisions) and statistical data processing (automatic rating, optimization of commodity and cash flows, automatic checks). Created for the user, digital applications allow various options for ultimate solutions in economics and management whose technological justification is hidden from the executives responsible for the implementation? It leads to a reduction of the scale of application of a generally useful and promising technology in the economic sphere since this misunderstanding does not allow a wide circle of professionals to clearly formulate tasks aimed at generating a simple management solution in appropriate terms perceived by the system.

In other words, the change in technology is ahead of the change of the person using these technologies in economic, managerial or other applied aspects, stipulating the need to overcome this gap. In addition, these technologies demonstrate a certain technological and innovative power of the countries of their producers and affect the consciousness of an individual, the formation of their worldview and the corresponding behavior in relation to society, institutions of power. It is often associated with the erosion of national values and traditions in favor of copying the countries that created these technologies in this sense without taking into account the entire range of targets and the consequences of the practical implementation. It should be noted that the split of space and the economic system functioning within this space into the real and virtual sectors is very uncertain since they are in a single economic system, operate in its relations, function as constituent parts of the whole. Although these parts are different from each other. Such an approach allows simplifying the object of research and obtains the necessary scientific results.

There is no the generally accepted definition of the term virtual. The word virtual finds roots in the 14th century from the Medieval Latin word *virtualize* - effectively. This word is based on the Latin *virtus* superiority, potency, efficiency. The meaning of the virtual to be something in substance or fact, capable of producing a certain effect was firstly recorded on paper at the beginning of the

15th century. Later the computer feeling is not physically exist, but made for software has been confirmed since 1959. The study shows that there is a common point of view that the term virtual is interpreted as artificially educated. According to the British dictionary Webster the term virtual is interpreted as having an essence or effect, but not an appearance or form. The first part of this interpretation is confirmed by another author who believes that the term virtual has a physical reality but it is imaginary in the sense that the memory area does not coincide with the real physical memory consisting of transistors.

This interpretation of the term Virtual is also applicable as capable of affecting through the inherent energy. In the explanatory dictionary of Ushakov Virtual (Latin virtual), is interpreted as being in a latent state but can appear, happen. Some authors basing on the term virtual point out virtual exist with the help of digital devices, hence, the digital economy is a virtual economy. Thus, there is a recognition of something that exists in the word virtual (having power and capable of producing an effect) but invisible, hidden. Hence the problem of recognizing and identifying a virtual, as an object of economic relations, is its essence, goals and results. Theoretical studies of this problem carried out by different authors and real practice demonstrate that modern relations of the virtual and real worlds are characterized by convergence or conjunction as well as interaction. The exchange of information and the sale of goods through the Internet, work in the remote access system has now become an integral part of economic activity. Nevertheless, at the same time, there is a specific interaction between virtual and real requiring a certain understanding and accounting in real practice.

The basic components of the interaction between the digital and real sectors of the economy are Computer, Internet and User. A computer is a tool that allows entering the virtual world and joins the process of interaction of the real and virtual sectors of the economy. The Internet serves as a means of providing the desired interaction. An individual is the main component in this triad, the creator and consumer of virtual reality linking the first two components into an integral system of interaction. From a conceptual point of view this triad forms the basis for the virtual interaction of the two sectors of the economy. When interacting with each other the real and digital sectors of the economy perform its part of the functions while working on the unified economic system. The digital economy acts as a relationship between people related to the production and use of information, including digitization. In fact, the main subject of the digital economy is the production relations of people which will provide the reproductive process with information. It is compulsory in order to ensure the production (the main economic process) of the essential data. Since the process is carried out on the basis of land, labor and capital but also one more important resource - information.

It should also be noted that the relationship of the digital economy will directly affect the production process; it will also affect the process of interaction with the state, the institutional environment, contributing to the fulfillment of the strategic tasks of its development and sustainability. The emergence of new forms of interaction between the two sectors of the economy (the introduction of convertible payment systems, the sale of real estate, the opening of virtual businesses, the use of various types of electronic money, etc.) is due to the need for the virtual sector of the economy to acquire attributes of the real world and the need for the real sector of the economy to expand its capabilities. The digital sector of the economy does not become a copy of the real sector of the economy. It only acquires some of its crucial features. There are both positive and negative results of the integration of the real and digital sectors of the economy expressed in complementing each other with both new opportunities and new risks of interaction. Consequently, there is a requirement for constant monitoring of the integration of the digital and real sectors of the

economy both within the country and into the system of world economic relations. Also, there is a need for protection of them from emerging risks.

The positive aspects of interaction are reduction of the time spent in the process of reproduction through the acceleration of production, exchange, consumption and accumulation, contributing to higher labor productivity. The virtual sector of the economy under appropriate conditions acts as a driver, a catalyst for the development of the real sector of the economy. Negative sides also should be considered: multiple complications of economic relations due to interaction; the availability of opportunities for the digital sector of the economy to withdraw capital from circulation and use it for speculative purposes in a free market; increase in the GDP of the share of the virtual sector of the economy obtained from the speculation in stock, commodity, financial markets, futures, wholesale and retail resale of the goods; the destruction of the state values and traditions established in the real sector of the economy throughout the history; through the introduction of digital civilizational viruses that negatively affect the culture of a multinational people, the lack of social responsibility mechanisms in the virtual sector of the economy. In this regard the management of the interaction of the real and digital sectors of the economy should be based on the training system of managers who possess not only financial, economic and regulatory competencies but also modern humanitarian knowledge allowing them to adapt to different cultures (including western and eastern directions) of participants of the virtual economy to the Russian values and local way of life. The digital economy does not produce traditional goods by itself compared to classical production. However, it is able to act as a factor of production growth and development when interacting with the real economy. The interaction of the digital and real sectors of the economy in modern economic systems is one of the specific forms of business relations that transform reality. This reality potentially contains new qualitative characteristics of virtual and real relationships. Being in the real world and showing a creative beginning an individual consciously constructs a virtual economic world and transfers the interaction relations into it. This idea is confirmed by the researcher Abeltsev: The root of the virtualization of the economy is that economic phenomena are now initially formed in the mind of the person, and not in reality (Abeltsev, 2013: 15). New information technologies make possible imparting to the mental factors an unthinkable power, projecting its interaction into the real world to such an extent that, in fact, two economies are being formed: real and artificial, where economic reality appears in the form of information instructions, not always correspondent to the condition and trends of the real economy.

The speed of the implementation of these relationships (for example, when performing financial transactions with electronic money) often exceeds the human capabilities of solving this problem in a traditional way, in real time and space. The nature of the interaction of the real and digital economies is based on the creation of the image of real production in the information space which partially embodied in the structures of material production, changing its condition. In its turn, such changed condition of the material space generates new images of virtual production. The basis of interaction of the virtual and real economy is the constructed electronic image of real economic relations packed in a convenient electronic shell. The basic foundation for the interaction of the real and virtual sectors of the economy is electronic money. It became possible to increase the speed of finance circulation through digital technologies, using computer memory and other possibilities.

Thus nowadays economic systems of different levels and scales pass a new period of the development which can be called the stage of building relations between the real and virtual sectors of the economy. One of the characteristics of this stage is the increasing activity of interaction between the real and virtual sectors of the economy. The process of interaction requires appropriate regulation being a significant non-material factor affecting the integrity of the economic system and

affecting the quantitative and qualitative characteristics of socio-economic development (GDP, employment, quality of life of the population). The interaction factor should be taken into account when assessing the financial results of the development of economic systems at various levels as well as the formation of strategic plans for the development of territories. A corresponding information, technological, and institutional infrastructure of innovative content is needed in the process of designing models for the interaction of the real and virtual sectors of the economy and ensuring the high quality of the relations between them. New stimulators of growth and development from the side of the state are required in order to create it.

As for the information infrastructure for the interaction of the real and virtual sectors of the economy, the problem of equal access to the country's population to the Internet has to be solved first. In order to achieve a high quality of interaction of the real and digital sectors of the economy the residents of remote settlements with a population of more than 1,000 people should be provided with broadband Internet access at a speed of 100 megabits per second. Whereas mobile operators need to be encouraged to introduce fifth generation networks (5G). Relating to the expert forecasts a significant increase in the number of patents for inventions in the field of information technology is expected in Russia by 2020 due to the state providing substantial tax benefits to companies engaged in the development of modern technologies. As a result of targeted state support high-tech enterprises will appear. Such development allows us to constantly update the information infrastructure and enter the global markets for the interaction of the real and virtual sectors of the economy. Furthermore, it contributes to the emergence of new generation personnel - designers of new interaction models. The employees will be prepared to base on the system of partnerships between universities, research institutes and enterprises of relevant specializations.

The interaction of the real and digital sectors of the economy should be regulated by international and Russian legislation injected into the institutional infrastructure. Legislative consolidation of the basic concepts and principles of regulation of the digital sector of the economy, duties and responsibilities of all participants in economic activity is required. It should be noted that there is a necessity to develop a comprehensive law that will regulate not only the development of the virtual sector of the economy, but also the issues of its interaction with the real sector of the economy. The creation of such a law will require the introduction of changes to existing regulatory and legal acts governing the interaction of economic entities and their correlation with the rules prescribed in this document in the international legal system. The interpenetration of the virtual and real sectors of the economy leads to the development of appropriate rules and congruent interaction. It should be the traditional rules of adaptation within existing formal and informal institutions as well as new rules and institutional innovations for the interaction of the virtual and real sectors of the economy, adequate to the changed conditions of the functioning of economic systems. In other words, the creation of institutional, regulatory and motivational conditions that ensure effective regulation of the processes of interaction of the real and digital sectors of the economy should become a key task of the state in the economic sphere.

At the same time, the formation of an adequate and integral institutional space is fundamentally important. The creation of an environment that will remove existing departmental, organizational, information, technical and other barriers and simplify the work of the subjects of interaction, manage risks in the interests of business as well as society and the state. Realization of these approaches to interaction in real practice allows an increase of speed of financial and business operations, reduction of transaction costs flexibly adapting to environmental changes, elimination of numerous barriers to entering new markets satisfying the demands of consumers more fully. Integration of the real and virtual sectors of the economy requires the adaptation of management

personnel that allows them to enter the sphere of joint activity in a natural way, join the norms of doing business in a virtual and really functioning economic environment, increase the stability of all components of the system without violating economic norms, corporate and traditional value of life.

4.2. Interaction of the real and digital sectors of the economy

Initially, the interaction between the real and virtual sectors of the economy is due to the emergence of a gap between them and the absence of any affairs based on cause-effect relationships. Therefore combining and linking the components of the real and virtual sectors of the economy in the process of interpenetration and ensuring its dynamic balance is a new source of development of modern economic systems. The interaction of the real and digital sectors of the economy takes place on the basis of commodity-money relations which differ from the classical ones because this interaction changes the standard forms of the exchange of resources and goods. Relationships become virtual carried out on the principle of circulation: the real sector of the economy acquires virtual forms in order to obtain mutually beneficial results, the virtual sector of the economy materializes in certain forms. There are shifts in the world outlook, the ethics of people involved in the process of interaction of the virtual and real sectors of the economy. Although the final result of these changes is not completely clear and not predetermined yet. Virtualization and the processes of interaction generate new opportunities that can bring new benefits as well as unexpected threats.

Due to the emergence of virtual relationships the management of economic systems is also forced to partially move from the real-material sphere to the virtual one. The institutional rules for the regulation are necessary in order to ensure that the process of transition of sectors of the economy from one form to another is not spontaneous with unpredictable results. It can be those rules that already operate in the real sector of the economy but it must be supplemented by new provisions and regulations that establish the framework for the behavior of subjects in the digital sector of the economy. The extent to which these rules will reflect the real processes of interaction and take into account all the subtleties of virtual-real economic relations will determine the magnitude of profit, the commercial success of market actors in socio-economic systems and the level of the macroeconomic stability. Integration of the real and virtual sectors of the economy in economic systems requires the adaptation of managerial personnel allowing to enter naturally into the sphere of joint virtual-real activity, to join the norms of doing business in a digital and really functioning environment, violating traditional values.

Taking into account the fact that the interaction of the real and virtual sectors of the economy is accelerating it requires a faster development of the institutional, regulatory and legal framework, the newly emerging relations which in dynamics lags far behind the real needs of the market. The confidence of managers that the interaction is carried out within the framework of the established legislation will lead to a more rapid development of interaction. It will proceed even more violently than now and will lead to the fact that Internet information will quickly penetrate into material production and the sphere of commodity-monetary operations becoming more and more productive and highly profitable. There are positively proven in practice sustainable organizational forms of combining virtual business entities that interact with the real sector of the economy. They unite market players to solve a specific target in response to the potential for all participants to increase profits or significantly reduce costs. They include: virtual companies, or temporary virtual enterprises for the implementation of a multi-project business; virtual teams - the unification of teams from specific, process-oriented units within large companies; virtual projects -

alliances of companies complementary to each other and gathered together to realize new opportunities appearing on the free market; virtual shell corporations - companies engaged in outsourcing the core business functions; virtual multinational companies - which can function both domestically and abroad; virtual network marketing companies - promoting information about goods and services through distribution networks; virtual scientific research organizations that create innovative products for open markets.

The transition of economic sectors from one form of relations to another should be regulated by institutional rules operating in the real sector of the economy supplemented by new regulations that establish the framework for the behavior of subjects in the virtual sector of the economy.

In the process of the interpenetration of economies many existing institutions are duplicated by the virtual economy allowing it to have own digital counterparts. In addition, new forms of economic interactions in virtual space, generate new practices that were not previously available in the real economic space, requiring the creation of institutions appropriate for existence and development. In a broad sense, we can talk about the emergence of virtual economies by new economies in economic systems based on specific rules of behavior, ethical norms, and ways of communication and interaction which differ from those traditionally used in real life practice. Actually based on the interaction of the real and digital economies in economic systems a new specific type of business culture is formed with inherent laws, rules, traditions that affect the way of life of the population.

Various high technological digital platforms such as Block chain based on the principles of decentralization, cryptographic evidence of transactions, security are developed in the system of interaction of the real and virtual sectors of the economy. The business model of using such platforms by independent groups of interaction participants involves the exchange between products and services uploading them to a special remote server, to the cloud, generates profit. A popular form of interaction between the real and virtual sectors of the economy in Russia are electronic trading platforms. They allow users of this type of services to achieve a reduction in financial resources on purchases up to 40% if the platform is focused on small and medium-sized businesses, while also saving customers' working hours. The functioning of such sites is based on the relationship between the real and virtual sectors of the economy assuming the receipt of applications from consumers of goods and the provision by the producer of goods of the real sector of the economy through the intermediary, such as the manager organizing the process of interaction (Votintseva et al., 2012).

Applications from customers enter the virtual site to the appropriate suppliers after they are checked by the manager. In the database of executors of applications from the real sector of the economy more than a million companies are registered and there is a great variety to make a choice. Lists of suppliers of goods with a suitable profile of activity from the real sector of the economy are constantly updated by site moderators and maintained in working order. According to statistics one order receives about five offers from suppliers from the real economy in average. The first response comes very quickly, within a few minutes. The convenience of interaction consists in the fact that participants do not need to contact only through the site: all information is open and duplicated by e-mail. At the same time the Russian electronic trading platforms need substantial consolidation due to the use of modern virtual technologies tested in practice in economically developed countries and the creation of competitive advantages due to the implementation of specific goods inherent in Russian production. Interaction of the real and virtual sectors of the economy during the reconstruction of large cities is highly perspective with the introduction of digital technologies for

the management of energy, water, land and other natural resources. The interaction here can also affect the automation of the parking space and various public transports (Muselyan et al., 2017).

4.3. The scale of the real and virtual sectors of the economy

The scale is visible in terms of the monetary volume in each of them and by the specific weight they occupy, for example in the regional economy. According to the available statistics the volume of investments in the circulation of regional economic systems is about 29.2 trillion rub. The amount of money in the real sector of the economy that serves the purchase and sale of traditional goods is 7.2 trillion rub; the remaining 22 trillion rub. (Three quarters) function in the virtual sector of the economy. The ratio of the investments in the real and virtual economies is one to three. It could be seen that the scale is significant and the ratio of the real and virtual economies is far from dynamic equilibrium due to the absence in real practice of the necessary regulators of this process. In developed countries the share of the digital economy in GDP is constantly growing and is about 5.5%. While in developing countries with a general growth trend this figure is 4.9%. The world leader in the share of the digital economy in GDP is Great Britain. It creates new trends in the formation of the structure of GDP. Despite the fact that the real estate still occupies the first place in terms of the share of GDP, the second place is occupied by the digital economy sector which includes online trade, government spending related to the Internet, IT (Information Technology) and telecommunications. According to the growth rate the digital economy sector is ahead of the real production sector and the usual trade. Relating to the forecasted estimations the digital economy in the UK may exceed 12% of GDP while in the G20 it may be half as much (Dmitrieva, 2014).

Is it possible for other countries in the world community to consider these trends as compulsory? How to perceive the dominant development of the digital economy in comparison with the real sector of production? To answer these questions we need to thoroughly understand each case and develop the right solutions. For example, the share of the digital economy in Russia in GDP has come close to 3%. Most of them account for Internet-based and electronic services. Other activities in the digital economy are less developed. Although it is clear that a number of them should be increased. But it does not mean the reduction of production in the real sector of the economy at the cost of the development of the digital sector is required. Taking into account the fact that Russia is a large industrial country with large reserves of natural resources and with a favorable combination of all factors of production, this sector in the strategic perspective can be the most effective than the digital economy sector. Therefore suitable for Russia way to follow is finding a balance of interests in the relationship of the digital and real sectors of the economy, taking into account the interests of society and the state (Akimova, 2010).

A completely opposite picture in the relationship between the development of the digital and real sectors of the economy can be found in countries that do not have serious reserves of raw materials. For them the priority is given to the development of the digital economy sector, the use of intellectual labor, the preparation of highly educated, competent personnel for new specialties. The most pronounced interaction of the real and virtual sectors of the economy takes place in such spheres of activity as production trading circulation; the movement of fictitious financial capital; game sphere, education; health; public services; electronic money; electronic marketing; electronic insurance services; organizations that regulate property relations. If we focus on the work of organizations dealing with property relations from an economic point of view virtual intellectual property is an analog of real intellectual property with its inherent relationships. The author

substantiates the provision that intellectual virtual property objects can be considered as values in respect of which the taxation system can be applied according to the principles used in the real sector of the economy. Taxation can also be made on the profits generated from the use of intellectual property rights (Alexandrovich, 2010).

The connection between the real and virtual sectors of the economy in the sphere of production is manifested in the form of a special system of economic relations generated by the financial market on which securities are traded and money is redistributed. The rate of primary securities is determined primarily by the dynamics of production and changes in profit. The larger and more stable these indicators are, the higher the stock price and the amount of capital. The virtual market of primary securities plays a certain role in the implementation of expanded reproduction. It allows orientation in choosing the spheres of investment in the real sector of the economy. The connection of this market with the real sector of the economy is mediated, but fairly stable.

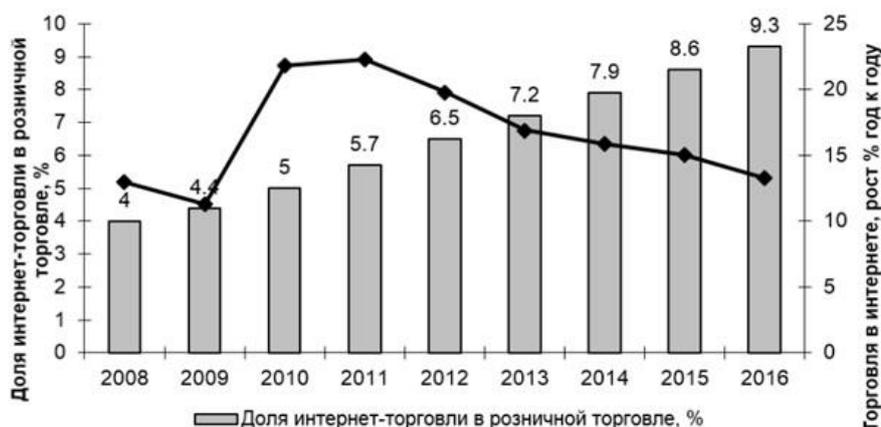


Figure.1 Dynamics of the growth of Internet commerce in the structure of retail trade

The interaction of the real and virtual sectors of the economy expands the space of production economic relations, facilitates the acceleration of mutual settlements of business entities of economic systems.

4.4. Influence of interaction of real and virtual economy on GDP

The statistics of GDP reflections are changing with the development of the virtual sector of the economy. It included the results of the real production as well as the virtual sectors of the economy. Some of those results came from speculation in stock, commodity, financial markets, futures, wholesale and retail resale of goods. For example, in the world GDP amounting to tens of trillions of dollars up to 25% falls on financial, trade speculation, mark-ups and the entertainment industry. The increase in GDP is due to the growth in the volume of the virtual economy, rather than the increase in production. If we take into account the stable global trends in the ratio of GDP growth and the increase in the amount of money, we can state that for a long time, including 2016, the increase in the amount of money is almost 2 times higher than GDP growth. That is, the money supply grows 2 times faster than production, contributing to its depreciation. This trend is steadily manifested at the level of regional economic systems as well as at the state level. GDP is increasing due to financial and trade speculation. It requires constant monitoring of changes in the GDP

structure of regional economic systems, using mechanisms to stimulate the growth of the real sector of the economy and its sustainable development (Aptekman et al., 2014).

It should be noted that the increase in GDP due to the virtual sector of the economy does not reflect objectively the results obtained by it. In many ways, this inaccuracy is caused by the formation of prices for virtual goods and services. It is also due to the fact that in today's practice of interaction between the real and virtual sectors of the economy a notion of price has emerged as the monetary expression of the value of a virtual product, not a real product having a material embodiment. Many countries have established a share of the virtual economy in GDP for the future, significantly exceeding the achieved values. So by the year 2025 the United States set this figure at 10.95%, China - 10%, European Union - 8.2%, which is almost 3 times higher than the available indicators (Lehdonvirta, 2013).

Measuring the number of inhabitants using the Internet, Russia came out on top in Europe and the sixth - in the world as a whole. The digitization of the economy in Russia can increase the country's GDP by 2025 from 19 to 34% due to the growth of the purchasing power of citizens, improving the quality of education, health care, security, modernization of the basic spheres of people's livelihoods and other systemic measures taken by the government, business and society (Medovnikov and Ognesyanyan, 1997).

4.5. Drivers of interaction between the virtual and real sectors of the economy

Since in the virtual sector of the economy much more financial resources are concentrated than in the real sector, it can act as a monetary reserve of a real economy. However appropriate conditions are needed. For example, to specifically motivate and stimulate the flow of financial resources into the real sector leading to a higher rate of return than when using it in the virtual sector of the economy. Financial resources will go back to the virtual economy with the deterioration of the conditions in the real sector and a low rate of profit. The flow of money can be regulated by the introduction of a system of tax regulators for the development of certain sectors of the virtual economy (Keshelava et al., 2017).

Interaction ensures the acceleration of production, exchange, distribution and consumption, save time for the implementation, increase intensity, volumes and productivity. However, at the same time, new risks also appear caused by a number of economic relations in a virtual nature and necessitating the use of non-traditional measures of protection against it. The situation with risks is complicated. For example, by the fact that both sectors of the economy are in substantial dependence on each other which increases the risk for each of them. Highlighting the main factors the mutual dependence of the real and virtual sectors of the economy, securing it in a single whole, limiting the possibility of its separate existence must be taken into account when assessing the risk of interaction. The development of the virtual economy sector in the system of social and economic relations can cause the emergence of mass unemployment among the specialists of the lower and middle level, lead to a reduction in the middle class since the jobs they occupy will be automated and replaced by robotics (Efimushkin, 2017).

There is also a dependence: the existence of a virtual economy from computer technology and modern means of telecommunications created in the real sector of the economy; the existence of a real economy from a virtual economy in matters of the usage of electronic money; application of software products for accounting; creation and usage of sites for advertising and other purposes; provision of electronic services. Risks reduction or the likelihood of losses in the interaction of the real and virtual sectors of the economy is possible due to: increasing the quantity and improving the

quality of information on the basis of which the relationship management and interpenetration of the economic sectors are managed; optimization of the distribution of financial resources between different levels of budgets depending on the effectiveness of socio-economic development of the territories, their status and establishing permissible ratios of the volumes of the virtual and real sectors of the economy. The driver of the interaction between the real and virtual economies is the indirect influence on the increase in the image component of the economic system where it is implemented. For example, at the level of economic entities and the reputation of the personnel employed (through the availability of Internet sites, advertising, through the use of modern communications, through corporate social reporting, posted in an open network) (Novikov and Shershunova, 2012). The image component of the interaction between the digital and real sectors of the economy acts as an information element to enhance the economic attractiveness of the organization, to establish interaction between government, business and the population in the same information space (Leontieva and Berezhnova, 2013).

Despite the mutual benefits of the interaction of the real and digital sectors of the economy, it contains significant risks that can be reduced by increasing the quantity and improving the quality of information on the basis of which the relationship management and interpenetration of the real and virtual sectors of economies are managed. It is also possible to optimize the distribution of financial resources between budgets on various levels, depending on the level of effectiveness of socio-economic development of the state and establishing the permissible proportions of the volumes of the virtual and real economy. From an economic point of view virtual intellectual property is analogous to real intellectual property with its inherent relationships. Objects of intellectual virtual property can be perceived as values in respect of which the taxation system is possible according to the principles used in the real sector of the economy (Minakov, 2016). Taxation can also be made on the profits generated from the use of intellectual property rights. The interaction of the real and virtual economies has an indirect effect on increasing the image component of the economic system and the reputation of the personnel employed (through the availability of Internet sites, advertising, through the use of modern communications, through corporate social reporting, business entities posted in an open network). The image component of the interaction between the virtual and the real economy acts as an informational element for increasing the region's economic attractiveness, establishing interaction between the government, business and the population of the same information space (Novikov, 2013).

The emergence of new forms of interaction between the two economic sectors (the introduction of convertible payment systems, the sale of real estate, the opening of virtual businesses) is caused by the need to acquire virtual attributes of the real world and the need for a real economy to expand its capabilities. The virtual sector of the economy does not become a copy of the real sector of the economy. It acquires only some of its features. There are also negative aspects of interaction between the real and digital sectors of the economy: multiple complications of economic relations caused by interaction; the availability of opportunities for a virtual economy to withdraw capital from circulation and use it for speculative purposes in a free market; the increase in the structure of GDP regions of the specific weight of the results of the virtual sector of the economy obtained from speculation in the stock, commodity, financial markets, futures, wholesale and retail resale of goods. Real and virtual sectors of the economy interacting with each other create new opportunities by integrating their potentials and complementing each other. Interaction ensures the acceleration of production, exchange, consumption and accumulation, saves time for their implementation, increases intensity, volumes and labor productivity and necessitates the use of non-

traditional measures to protect against risks caused by the virtualization of a number of economic relations (Shamsetdinov, 2009; Ushakov, 2012).

There are factors of mutual dependence of the real and virtual sectors of the economy limiting the possibility of their separate existence. Such factors, for example, are competition which stimulate economic systems to economic growth and development. The dependence of the existence of a virtual economy on computer equipment and modern means of telecommunications created in the real sector of the economy is noted; the dependence of the existence of a real economy on a virtual economy in matters of: the electronic money usage; application of software products for accounting; creation and usage of sites for advertising and other purposes; provision of electronic services. The interaction of the real and virtual sectors of the economy generates new opportunities under the influence of these factors by integrating the potentials and complementing each other. It ensures the acceleration of the processes of production, exchange, consumption and accumulation, saves time for their implementation, increases the intensity, volume and productivity of labor. The interaction of the real and digital sectors of the economy follows the tendencies of the development of globalization. It is largely subordinated to the interests of transnational corporations, international banks, enhances the activity of cross-border capital flows and raises the risks of financial absorption of small business entities, larger ones. These changes require constant monitoring of the interaction between the virtual and real sectors of Russian economic entities into the system of world economic ties and protecting them from emerging risks (Putkina, 2015; Putkina, 2016).

5. Conclusions

There is an activation of the interaction of the real and digital sectors of the economy in economic systems of different levels and scales. Activation is a significant non-material factor affecting the integrity of the economy and affecting the quantitative and qualitative characteristics of the socio-economic development of territories (GDP volume, employment, quality of life of the population). This factor should be taken into account when assessing the financial and economic results of the development of territorial economic systems when forecasting indicators and formulating strategic development plans. The practical significance of the study which materials are outlined in this article is developing recommendations on the interaction of the real and virtual sectors of the economy in economic systems on a different level of management. The results can be used by business entities of real and virtual sectors, governments in dealing with the problems of budget financing, in order to increase the investment attractiveness of the economy, strengthening the economic independence of territories. Research materials can be useful in the educational process of higher education institutions (Ukolov et al., 2015).

6. Conflict of Interest

The author confirms that the presented data do not contain any conflict of interest.

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