

Information and Communication Technologies as a New Vector of Development of Modern Global Economy

Tecnologías de la información y la comunicación como nuevo vector de desarrollo de la economía global moderna

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ABSTRACT:

The purpose of the work is to study the perspectives of establishment of information and communication technologies as a new vector of development of the modern global economy. It is achieved with the help of regression and correlation analysis used for determining the influence of growth of the global economy depending on the change of various resource factors. The indicators of growth and development of the global economy in this work are global GDP in current prices and global GDP per capita in current prices. The resource factors of growth and development of the modern global economy are human resources (number of population), financial resources (volume of direct foreign investments), and technological resources (level of development of information and communication technologies). Statistical data on the values of the above indicators are systematized on the basis of the International Telecommunication Union and the International Monetary Fund for 2010-2017. As a result, the authors prove that innovational potential of land, human, and financial resources is already depleted, which does not allow them to become the

RESUMEN:

El objetivo del trabajo es estudiar las perspectivas del establecimiento de las tecnologías de la información y la comunicación como un nuevo vector de desarrollo de la economía global moderna. Se logra con la ayuda del análisis de regresión y correlación utilizado para determinar la influencia del crecimiento de la economía global en función del cambio de varios factores de recursos. Los indicadores de crecimiento y desarrollo de la economía global en este trabajo son el PIB mundial a precios corrientes y el PIB mundial per cápita a precios corrientes. Los factores de recursos de crecimiento y desarrollo de la economía global moderna son los recursos humanos (cantidad de población), los recursos financieros (volumen de inversión extranjera directa) y los recursos tecnológicos (nivel de desarrollo del desarrollo de las tecnologías de la información y la comunicación). Los datos estadísticos sobre los valores de los indicadores anteriores se sistematizan sobre la base de la Unión Internacional de Telecomunicaciones y el Fondo Monetario Internacional para 2010-2017. Como resultado, los autores prueban que el potencial innovador de los recursos terrestres, humanos y

growth vectors of the global economy. Innovational development technological resources will allow turning them into a new vector of growth of the modern global economy and restoring the potential and giving new impulse to development of other resources, thus ensuring systemic development of the global economic system and emergence of synergetic effect, related to its sustainable and well-balanced growth in the long-term. The authors offer a new concept of development of the global economy through the prism of crises and resources which are sources of their overcoming and develop the proprietary model of development of the modern global economic system according to the new vector – information and communication technologies.

Keywords: information and communication technologies, vector of growth and development, modern global economy.

financieros ya se ha agotado, lo que no les permite convertirse en vectores de crecimiento de la economía global. Los recursos tecnológicos de desarrollo innovador permitirán convertirlos en un nuevo vector de crecimiento de la economía global moderna y restaurar el potencial y dar un nuevo impulso al desarrollo de otros recursos, asegurando así el desarrollo sistémico del sistema económico mundial y la aparición de efectos sinérgicos, relacionados con su crecimiento sostenible y equilibrado a largo plazo. Los autores ofrecen un nuevo concepto de desarrollo de la economía global a través del prisma de las crisis y los recursos que son fuentes de su superación y desarrollan el modelo propietario de desarrollo del sistema económico global moderno según el nuevo vector: las tecnologías de la información y la comunicación.

Palabras clave: tecnologías de la información y la comunicación, vector de crecimiento y desarrollo, economía global moderna.

1. Introduction

Modern global economy has passed the crisis phase but is still in the phase of deep stagnation – despite the experts' expectations for quick transition to the phase of intense growth. These expectations were based on the theory of economic cycles, according to which crisis activates "reboot" of economic system and creates an impulse for its new innovational development. The state of stagnation negatively influences the global economy – it is not just a period with zero or minimum economic growth but the time of low living standards due to preserving mass unemployment and deficit of state budgets, which hinders execution of state social obligations all around the world.

As the global crisis influenced the countries with developing economy, and countries with developed economy are quicker in overcoming the recession, the longer the phase of stagnation of the global economy the stronger its disproportions Structural imbalance of the modern global economy reduces sustainability of its development, as it can become a cause of the future global social crisis, the first manifestations of which are seen today. Thus, the problem of the search for quick overcoming of the consequences of the global crisis and the global economy's overcoming the phase of stagnation is very topical from the scientific point of view.

According to the offered scientific hypothesis, innovational potential of land, human, and financial resources is already depleted, which does not allow them to become growth vectors of the global economy. Innovational development of technological resources will allow turning them into a new vector of growth of the modern global economy and restoring the potential and giving new impulse to development of other resources, thus ensuring systemic development of the global economic system and emergence of synergetic effect, related to sustainable and well-balanced growth in the long-term. The purpose of this work is to study the perspectives of establishment of information and communication technologies as new vectors of development of the modern global economy.

2. Materials and method

The offered hypothesis is verified with the help of the method of regression and correlation analysis. The authors create regression models of the type $y=a+bx$, in which the value of coefficient "b" shows how (increase – "+" or decrease "-") and to which extent (numerical value) the values of indicators of growth and development of the global economy ("y") change with the change of values of various resource factors ("x") by 1. The authors also calculate coefficients of correlation that reflect dependence of y on x and show statistical significance of the received model of paired linear regression and level of connection between the studied indicators.

The indicators of growth and development of the global economy in this work are global GDP in current prices and global GDP per capita in current prices. Resource factors of growth and

development of the modern global economy are human resources (number of population), financial resources (volume of direct foreign investments), and technological resources (level of development of information and communication technologies). Statistical data on the values of these indicators are systematized on the basis of materials of the International Telecommunication Union and the International Monetary Fund for 2010-2017 and are given in Table 1.

Table 1

Dynamics of the scale of flows of various types of resources and growth of the global economy in 2010-2017.

Indicators	2010	2011	2012	2013	2014	2015	2016	2017
Global GDP in current prices, \$ billion	65,349.00	72,374.00	73,631.00	75,566.00	78,037.00	73,502.00	75,213.00	77,695.03
Global GDP per capita in current prices, \$	9,451.00	10,345.00	10,402.00	10,553.00	10,799.00	10,054.00	10,167.00	10,502.51
Number of population in the world, billion people	6.89	6.97	7.06	7.14	7.23	7.31	7.39	7.42
Volume of direct foreign investments into the global economy, \$ billion	1.36	1.86	2.28	2.13	2.12	1.79	2.32	2.14
Level of development of ICT, points	5.39	5.97	6.07	6.25	6.43	6.01	6.25	6.48

Source: compiled by the authors on the basis of (International Telecommunication Union, 2017), (International Monetary Fund, 2017a), (International Monetary Fund, 2017b).

3. Discussion

The theoretical and methodological basis of the research consists of the modern Theory of economic cycles, the main provisions of which are given in the works of such scholars as (Makarov and Parovik, 2016), (Pilipenko et al., 2016), (Bernard et al., 2014), and (Ales et al., 2014). The authors of this paper also use the works of modern researchers in the sphere of growth and development of the global economy, among which are (Popkova et al., 2016a), (Popova, et al., 2016b), (Kuznetsov et al., 2016), (Kostikova et al., 2016), (Simonova et al., 2017), and (Sozinova et al., 2016).

The authors also use the works of various authors, devoted to studying the possibilities and directions of application of the new ICT, which include (Ragulina et al., 2015), (Bogoviz et al., 2017), (Orudjev et al., 2016), and (Bogdanova et al., 2016).

4. Results

As the result of analysis of indicators from Table 1, we received the following data (Table 2).

Table 2

Correlation and regression of growth and development of the modern global economy with various resource factors

Factors (types of resources) that potentially influence growth and development of the modern global economy	Correlation and regression			
	Global GDP in current prices (y1)		Global GDP per capita in current prices (y2)	
	R2, %	b, \$ billion	R2, %	b, \$
Number of population in the world (x1)	56.98	3,725.30	16.78	-4,125.95
Volume of direct foreign investments into the global economy (x2)	67.77	5,304.21	59.03	8,310.17
Level of development of the ICT (x3)	98.96%	3,368.97	79.73	3,820.65

Source: compiled by the authors.

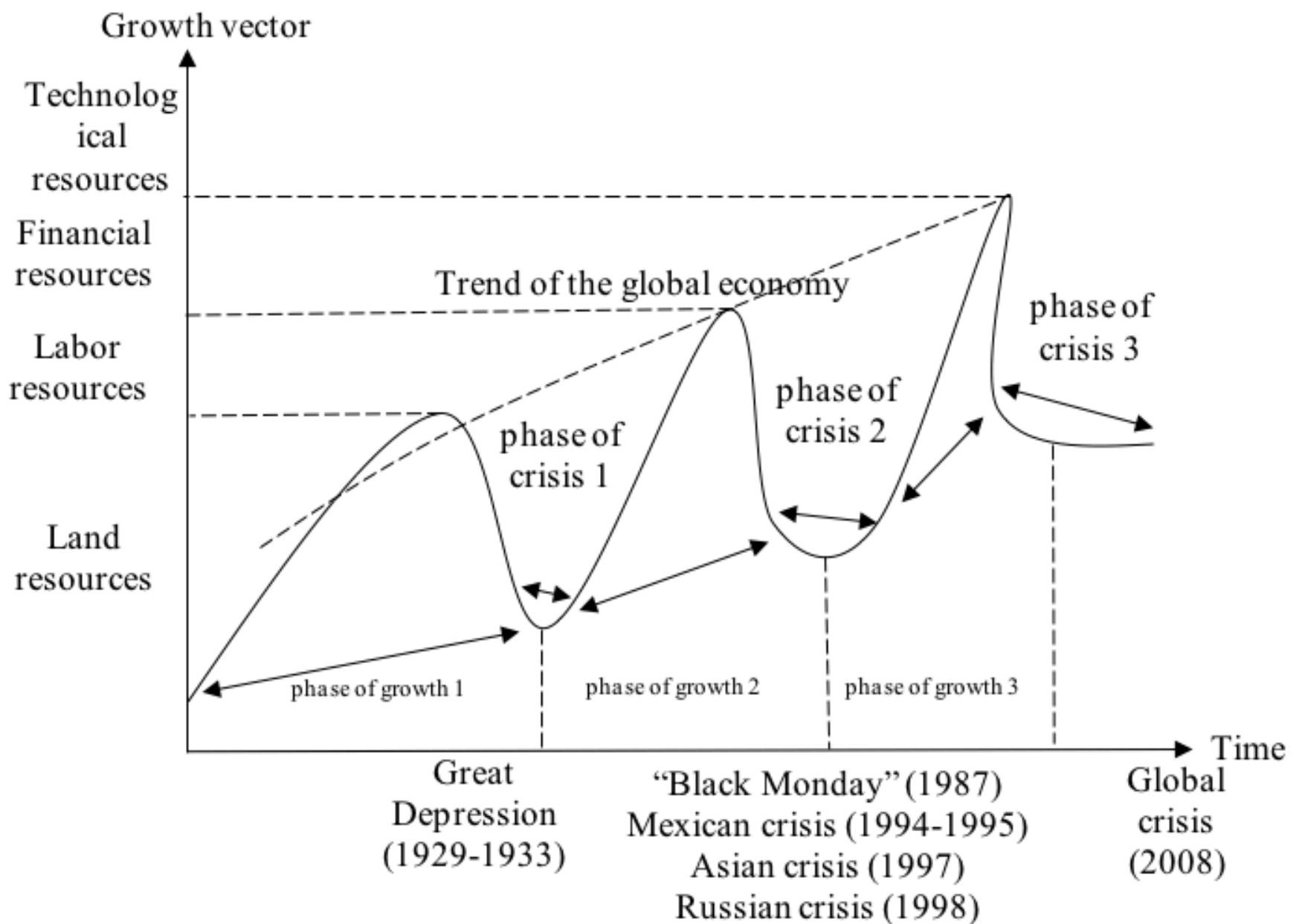
As is seen from Table 2, with increase of the number of population in the world by 1 billion people, global GDP in current prices grows by \$ 3,725.30 billion (the dependence is moderate, correlation equals 56,98%); with increase of the volume of direct foreign investments into the world economy by \$1 billion it grows by \$5,304.21 billion (the dependence is moderate – correlation equals 67.77%); with increase of the level of development of the ICT by 1 point it growth by \$3,368.97 billion (the dependence is strong – correlation equals 98.96%).

With increase of the number of population in the world by 1 billion, global GDP per capita in current prices decreased by \$4,125.95 billion (the dependence is weak – correlation equals 16,78%), with increase of the volume of direct foreign investments into the world economy by \$1 billion it decreases by \$8,310.17 billion (the dependence is moderate – correlation equals 59.03%), with increase of the level of development of the ICT by 1 point it decreases by \$3,820.65 \$ billion (the dependence is strong – correlation equals 79.73%).

Thus, the strongest direct influence on the growth of global GDP and GDP per capita are performed by technological resources, namely ICT. Based on deep study of development of the global economy through the prism of crises and resources that are the sources of their overcoming, we have built the following concept which specifies the modern Theory of economic cycles (Figure 1).

Figure 1

The concept of development of the global economy through the prism of crises and resources that are the sources of their overcoming

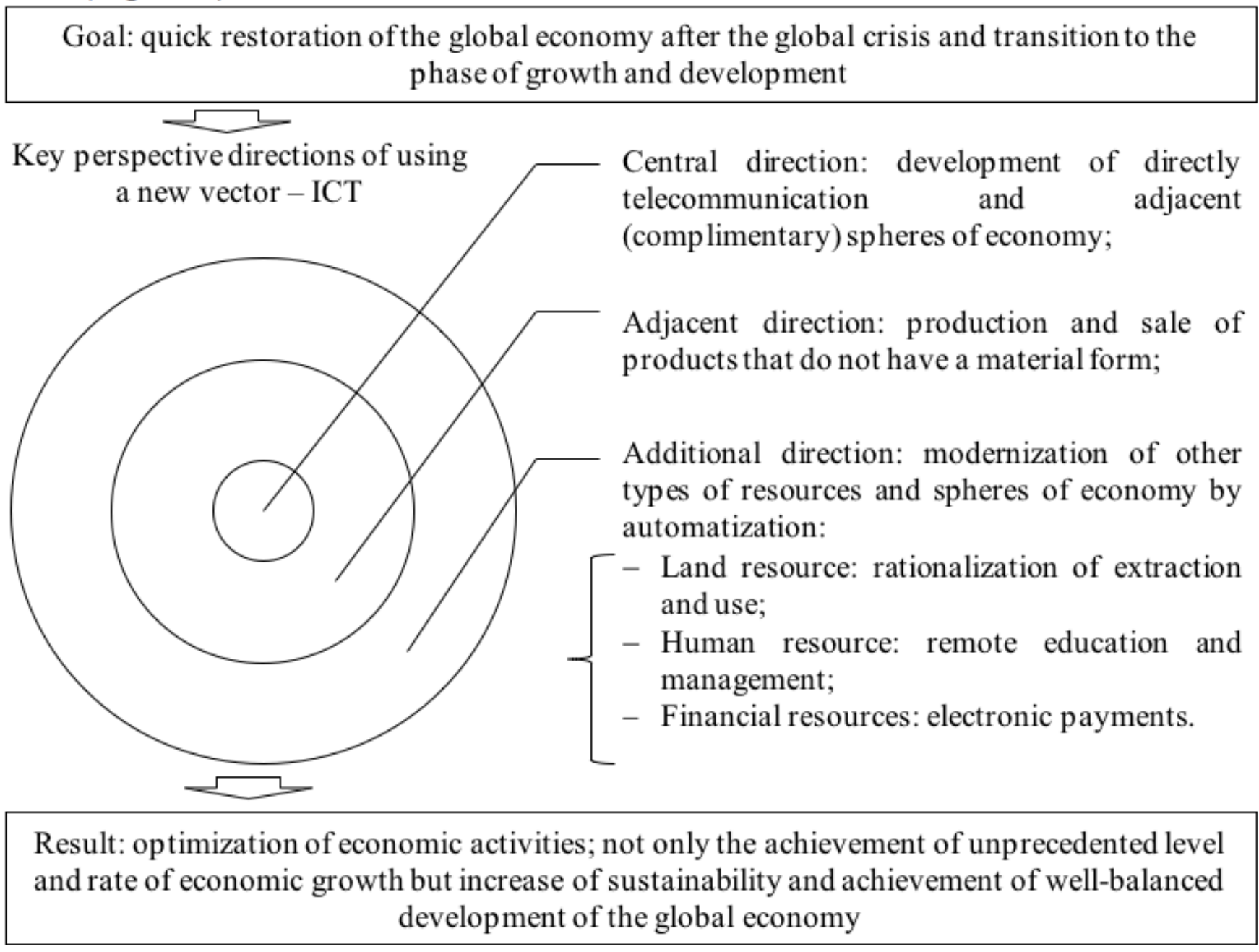


Source: compiled by the authors.

As is seen from Figure 2, the initial growth vector of the agrarian-oriented global economy was land resources. After the 1929-1933 crisis (Great Depression), there appeared necessity for the search for new vector of development of the global economy which entered the path of post-industrial development – this vector was labor resources. After a wave of crises of 1990's (Black Monday of 1987, Mexican crisis of 1994-1995, Asian crisis of 1997, and Russian crisis of 1998) there appeared a need for new vector of growth of the global economy. Transition to the post-industrial model of development made service sphere and financial resources such vector.

The 2008 financial crisis became another signal for the search for a new vector of growth and development of the modern global economy, which, in our opinion, should be technological resources – namely, ICT. As is seen from Figure 1, despite the cyclic fluctuations, the trend of development of the global economy is growing. At that, each next phase of growth becomes shorter and the crisis phase becomes longer. Therefore, despite the post-crisis increase of economic indicators, social consequences of the global crises become more vivid and negative.

Figure 2
Model of development of the modern global economic system according to the new vector – ICT



Source: compiled by the authors.

As is seen from Figure 2, for the purpose of quick restoration of the global economy after the global crisis and transition to the phase of growth and development, we distinguished three main perspective directions of using a new growth vector – ICT. The central direction: development of telecommunication and adjacent (complimentary) spheres of economy, i.e., directly ICT. In view of growing demand for products of these spheres, they may constitute the largest share in the structure of global GDP in near future.

Adjacent direction: production and sale of products that do not have material form. Here we speak of financial speculations on stock market and game industry of the global economy, which, with minimal expenditures of resources (primarily, renewable) allow creating high added value. Additional direction: modernization of other types of resources and spheres of economy by automatization.

In the aspect of land resources, this could be rationalization of their use by improvement of technologies and equipment on the basis of intellectual computer systems, in the aspect of human resources – remote education and management, in the aspect of financial resources – electronic payments. On the basis of new ICT it is possible to create automatized utilities infrastructure, commercial, and military equipment, stimulating intense development of these spheres of economy.

That is, information and communication technologies allow starting the work of economies on the whole – not just narrow spheres that specialize in production and distribution of one type of resources, as was observed at the previous phases of the global economy's growth (before 2008). As a result, optimization of economic activities, and not only the achievement of unprecedented level and rate of economic growth but increase of sustainability and achievement of well-balanced development of the global economy are gained.

5. Conclusions

As a result of the performed research, it was proved and shown that information and communication technologies (technological resources) can and should become a new vector of development of the modern global economy. This is explained by the fact that, firstly, the potential of other types of resources (non-technological) has depleted, and they lead to development of only certain spheres of the global economy, thus increasing its structural and sectorial disproportions.

The advantage of the ICT as a new vector of growth and development of the modern global economy is complex positive influence on the whole global economic system, which allows ensuring development of not only telecommunication and adjacent sphere but modernizing other forms of resources and starting a wave of innovational development of other sphere of the global economy on the basis of automatization of production and distribution processes. This will allow accelerating the growth rate of the global economy and ensuring its sustainable and well-balanced development in the long-term.

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