# INNOVATION AS A DOMINANT FEATURE OF GLOBAL COMPETITIVE LEADERSHIP IN THE AGE OF TECHNO-GLOBALISM

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**Abstract**. The universal imperatives of achieving global competitive leadership of national economies nowadays include moving towards intelligent social practices in combination with the ability of economic entities to constantly innovate, the process of socialization with social inclusion as a priority, and efforts to achieve green industry as well as green living environment within the global development paradigm. The purpose of this research is to study the features of innovative development models typical for rapidly growing countries and regions in the age of techno-globalism. The findings of the study show that deeper interaction between industrialized countries in the scientific and technological sphere and systemic technological advancements in most sectors of the economy have acquired a global nature. Under the influence of the information and communication revolution they have contributed to the emergence and development of techno-globalism that should be viewed as a global trend towards merging national technology systems into a global system of generating scientific knowledge and ideas, production and commoditization of innovative products. The main drivers of techno-globalism are multinational companies actively operating in the international information and innovation environment. It can be argued that "info-globalism" dominating virtually all world markets enables its participants to operate on virtual assets and liabilities, which significantly alters conditions and criteria of international competitiveness, when supremacy in the information and media sphere becomes a decisive factor of global lead-

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ership. At the same time, progress in scientific research and real practices of the world's leading countries encourage interpretation of globalization processes within the paradigm of «information society» and «new economy». The analysis on the leadership of innovative economies in global index context leads to the conclusion that in postindustrial economies, industries of which have long been dominated by services sectors and technocrats, experts and consultants constituted the leading «class», investments refocus from expanding production and accumulation of assets to human capital development. Thus, the leading countries have shifted the focus of their economies to the production and implementation of modern knowledge. Moreover, it should be noted that a significant natural resource potential always encourages countries to start their intensive exploitation, consumption and export, preserve traditional technologies, promote monopolization of markets, corruption, etc., which, in turn, reduces motivation for innovation and innovative activity itself, and hinders the development of new creative industries. The conclusion is that evolution of modern doctrines of economic development in the 21st century has led to a qualitative change in key goals, national and regional strategies, theories, as well as models and methods of research and justification. This substantially alters both the methodology and development strategies and practices of particular countries whose economic policies must take into account the latest development imperatives. Priority areas for development currently involve environmental protection, control of the financial sector, and social justice.

## 1. Introduction

The underlying development trend of the world economy at the end of the 20th – beginning of the 21st century is globalization manifesting itself in diametrically opposed perspectives. On the one hand, it appears in the «fundamental transformation of national technological systems and production methods through the introduction of the latest achievements and advancements in science and industrial technologies, industrial engineering and management methods», and, on the other hand, it is in growing imbalances in society and exacerbating economic development problems at the international level [13].

Today, increasing cooperation between industrialized countries in science and technology and systemic technological advancements in most

economic sectors have acquired a global nature. Under the influence of information and communication revolution, they have contributed to the emergence and development of techno-globalism that should be viewed as a global trend towards merging national technology systems into a global system of generating scientific knowledge and ideas, production and commoditization of innovative products. The main drivers of techno-globalism are multinational companies actively operating in the international information and innovation environment [5].

The researchers divided the entire period of technology in four stages of an important technological transition. Stages are defined as Industry 1.0, Industry 2.0, Industry 3.0 and Industry 4.0 accordingly. Each of the four stages can be attributed to the Industrial Revolution at some point, which reveals invisible growth opportunities.

Beginning in the late 18th century with the advent of steam power and the invention of the power loom, the first industrial revolution ushered in mechanization and radically changed how goods were manufactured. In the late 19th century, electricity and assembly lines made mass production possible, giving rise to the second revolution. Many cite the third revolution as beginning in the 1970s, when advances in computing enabled us to program machines and networks, powering automation.

Today the industrial environment is in transition to Industry 4.0, which significantly changed the production process.

Industry 4.0 signifies the fourth in a series of industrial revolutions, which are characterized by their ability to transform economies, jobs and even society itself through the introduction of new technologies and processes.

Industry 4.0 is driven by a great amount of data and advanced human-machine interaction. All this enables creating cyber-physical systems and mirroring the physical world in a virtual model.

As in the previous industrial revolutions, the impact of these changes has the potential to ripple across industries, businesses and communities, affecting not just how we work, but also how we live and relate to one another. However, this time, the revolution is advancing at extraordinary speed, driven by technologies developing at an exponential rate. Amid shifting demographics and unprecedented global connectivity – not just technological, but also social and economic – Industry 4.0 can herald greater opportunities than any that came before it and greater risks [16].

The definition of Industry 4.0 does not yet have a well-established wording, but science is moving along this path. Industry 4.0 is a relatively new term first introduced by the Federal Government of Germany that adopted the so-called High-Tech Strategy 2020 to pursue and expand the implementation of high-tech solutions in the German manufacturing sector. One of the most important stages of the German plan, namely Industry 4.0, became one of the most discussed issues in the scientific community.

There are four key categories that describe Industry 4.0: Cyber-physical systems (CPS), Internet of Things (IoT), Internet services and Smart factory. CPS represent a combination of physical and virtual worlds. They are interactive networks of physical and computational elements, which are involved in the Smart factory and related to AI technologies, integrated in manufacturing.

Internet of Things (IoT) is a network of devices such as automobiles, smartphones, household appliances, etc. that collect and exchange data over the Internet. IoT enables you to access the latest data accumulated around the world. A deeper understanding of IoT analytics improves productivity, creates new business models, and generates additional or new revenue streams. This is especially important for manufacturing companies that need to keep up with changing customer needs.

Like IoT, Internet services also represent digital networks, but the main product shared in the network is service. As the economy is moving rapidly towards a service economy, the idea of IoT must be clear and ready for implementation. Internet services cannot exist without the concept of IoT and CPS.

Smart factory can self-optimize and self-adapt in the production process. As a rule, it comprises all the three components described above: CPS, IoT, and Internet services. Smart factory output is characterized by CPS, providing clear standards of quality, timing, resources and costs in comparison with traditional production systems in real time. Smart factory is designed for sustainable and service-oriented business and allows companies to be flexible, responsive, and trouble-free and keep risks manageable throughout the entire manufacturing process. The most important feature of Smart factory is automation driven by digital processes. Digital IoT connectivity enables CPS to be flexible and adaptable to market fluctuations.

The scope of Industry 4.0 is to engage machines with workers and work units in creating intelligent networks with adapted target chains, which

could take decisions independently and autonomously, but still rely on a coordinated approach, ensuring integrated transparency and high flexibility for faster response to problems and weaknesses.

Thus, similarly to previous industrial revolutions, the impact of changes related to Industry 4.0 could potentially spread to all industries and economic systems.

## 2. Leadership of innovative economies in the coordinates of global indices

In the course of global economy establishment, traditional factors of development, actors and sectors of the world economy, competitive market mechanisms are discredited, which is manifested in certain trends, processes and imperatives. In global context, methodological approaches to the study of national competitiveness towards assigning priority to its innovation imperative require significant adjustments. A sharp decline in commodity dependence and partial decline in energy dependence due to recent «de-industrialization» of the economy is becoming increasingly obvious. In postindustrial economies, the industries of which have long been dominated by services sectors and technocrats, experts and consultants constituted the leading «class», investments refocus from expanding production and accumulation of assets to human capital development [1]. Already, countries such as Norway, Canada, Germany, Ireland and Austria have shifted the focus of their economies to the production and implementation of modern knowledge, which provides for a 50% increase in national wealth [2].

Indicative of this is the Human Development Index (HDI) of the United Nations, designed for the comparative assessment of welfare, literacy and average life expectancy in the country. The index is composed of three indicators: average life expectancy at birth, education level of the adult population including the ratio of people studying in primary, secondary and higher educational establishments, and the Gross Domestic Product (GDP) of the country. Countries are divided into four categories: very high, high, medium and low-index states [11].

Human Capital Index (HCI) takes into account the level of education, training, employment, life expectancy [12].

In general, it can be stated that, nowadays, innovative economies are becoming increasingly competitive. They are characterized by the Global

Innovation Index (GII), calculated by Cornell University, INSEAD Business School, and the World Intellectual Property Organization (WIPO). GII is based on ranking countries according to the potential and outcomes of innovation, with the recognition that innovation is a driving force of economic growth and prosperity. It uses indicators that go beyond traditional measuring, such as the level of R&D, to identify innovation trends and practices [18].

The 2019 GII rating was calculated as the average of two sub-indices: innovation spending, which allows us to evaluate the national innovation economy by (1) institutions, (2) human capital and research, (3) infrastructure, (4) market development, (5) business development and innovation returns, reflecting the actual evidence of innovative performance, and (6) knowledge and technology and (7) creativity.

The leading countries for these interconnected indices are presented in the Table 1.

Table 1

**Top 10 countries by Global Human Capital Index 2017, Human Development Index 2018 and Global Innovation Index 2019**

| Rank | Global Human Capital Index | Human Development Index | Global Innovation Index |
|---|---|---|---|
| 1 | Norway | Norway | Switzerland |
| 2 | Finland | Switzerland | Sweden |
| 3 | Switzerland | Ireland | The United States |
| 4 | The United States | Germany | The Netherlands |
| 5 | Denmark | Hong Kong | The United Kingdom |
| 6 | Germany | Iceland | Finland |
| 7 | New Zealand | Australia | Denmark |
| 8 | Sweden | Sweden | Singapore |
| 9 | Slovenia | Singapore | Denmark |
| 10 | Austria | The Netherlands | Israel |

*Source: compiled on the basis of the data [11; 12; 18]*

According to GII 2019, Switzerland has been the leader for many years.

In general, the GII rating demonstrates the global diversity: among the 25 most innovative countries in the world in 2019 there are not only the

economies of North America (Canada and the US) and Europe (Germany, Switzerland, and the United Kingdom), but of Southeast Asia, East Asia, and Oceania (such as Australia, Japan, Korea, and Singapore), and North Africa and West Asia (Israel) as well.

Economies labeled as «followers of innovation» are identified. They include many sub-Saharan economies such as Kenya, Madagascar, Malawi, Rwanda and Uganda; one country from North Africa and West Asia (Armenia); one from Southeast Asia, East Asia and Oceania (Vietnam); and some from Central and South Asia (India and Tajikistan).

Some economies get more return on their innovation investments than others: countries such as Bhutan, Brazil, Cambodia, Costa Rica, Georgia, Indonesia, Mexico, Morocco, the Philippines, South Africa, etc. are included here.

However, most activities are still concentrated in high- and certain middle-income countries, such as Brazil, China, India and South Africa. Only China demonstrates spending on R&D or other innovation indicators that are approaching rich countries such as the United States. Other middle-income countries are falling behind. The gap between the group of upper-middle-income economies and the group of high-income countries is large, especially in the development of institutions, human capital and research, infrastructure and creative output.

The gap between the top 10 innovation countries and everyone else is still wide. China (CN), Malaysia, and Bulgaria are the only middle-income economies that perform as well on most GII innovation input and output measures as the high-income group. China stands out for producing innovation output that is equivalent to Germany (DE), the U.K., Finland (FI), Israel (IL), and the United States of America (US) – but with considerably lower levels of input.

Among lower middle-income economies, Vietnam (VN) and India (IN) are among a small group of countries that achieve high impact for their innovation efforts. In the low-income group, the United Republic of Tanzania (TZ) achieves the same. This is especially evident in the indicators of business development, knowledge and technological results.

Regarding the innovation gap between middle-income countries and low-income economies, it keeps narrowing, partly because of calculation methods, and partly due to performance factors.

Noteworthy is the Innovation Capacity Index (ICI), which includes 61 variables, grouped by 5 components and may be seen as a subindex. These are: (1) institutional development (effective governance; assessment of country policy); (2) human capital, including education and the social sphere (education; social integration and equality); (3) regulatory environment (doing business); (4) scientific research (R&D infrastructure; patents and trademarks); (5) adoption and use of information and communication technologies (telephone, mobile cellular; the Internet, computers and TVs; government use of ICT; quality of infrastructure). Sweden is ranked 1st in the CII Index, the USA is 5th, Poland is 40th, the Russian Federation is 56th, Ukraine is 61st, China is 64th.

In today's context, information (access to knowledge, innovation, and communication) becomes a decisive factor in development [7]. «Info-globalism» dominating virtually all world markets enables participants in it to operate on virtual assets and liabilities increasingly, which significantly alters conditions and criteria of international competitiveness, when supremacy in the information and media sphere becomes a decisive factor of global leadership. It stimulates the comprehension of globalization processes in the paradigm of «information society» and «new economy» caused not only by progress in scientific research, but also by real practices.

Currently, more than 40% of the world's population enjoys the Internet connection, i.e. there are about 2.9 billion users [17]. This became possible thanks to mobile broadband available on smartphones and tablets. This kind of connection is the fastest-growing technology in the history of humankind. Today, the number of mobile broadband users is three times higher than those using traditional fixed-line connections.

Korea ranks first in the world in 2018 using broadband (per household). At that time, it was used by 98% of the country's inhabitants. In Monaco, these figures exceeded 44%, in Switzerland, Denmark and the Netherlands it reaches 40%. Among the leaders in the number of the Internet users are the United Kingdom, Japan and Canada. This is followed by the United States, Germany and Australia [17].

However, the largest proportion of users having fixed broadband per capita is in the US, Japan, Macau (China) and Estonia. More than 50% of Internet users on the planet are residents of 77 countries. Iceland

(96.5% of the population) is the world leader in worldwide connectivity, Africa is the lowest (less than 2%). The fewest Internet users in Ethiopia, Niger, Sierra Leone, Guinea, Somalia, Burundi and Eritrea. This list includes Myanmar and Timor-Leste, and no data on South Sudan at all [17].

2014 World Wide Web Foundation presents a fundamentally new rating for the Internet development in the world. The ranking is a list of countries in the world ranked by The Web Index, i.e., a comprehensive indicator that characterizes the level of influence of the Internet on various spheres of public life [19].

The index measures the level of development and impact of the Internet on society by the various indicators grouped into three main groups:

1. Web Readiness. Assessment of the level of development and quality of communication infrastructure in the country, as well as the development of institutional infrastructure and its regulatory aspects.

2. Web Use. Assessment of the level and intensity of Internet use in the country.

3. Impact of the Web. Assessment of social, economic and political indicators of state development in the context of their influence on the Internet.

Sweden is the leading country in terms of global network development in 2014.

In general, under the current conditions, the development of information and communication technologies determines not only the areas of transformation of consumer demand, forms of access to commodity and financial markets, but also innovation and overall competitiveness of countries and regions of the world.

According to the Networked Readiness Index, which is calculated on the order of Cisco estimates within the World Economic Forum and INSEAD organization from 2001 and describes the country's readiness to develop information and communication technologies (WEF-INSEAD Network Readiness Index) first places traditionally occupied the Nordic countries – Denmark, Finland, Iceland, Norway, Sweden. Over the last decade, this has remained a key factor in their competitiveness, even in comparison to information leaders such as the United States, the United Kingdom, Singapore, Switzerland, and the Netherlands [15].

### 3. Features of innovative development models of the rapidly growing countries and regions of the world

Despite the importance of traditional, mostly retrospective quantitative assessments offered by authoritative international ratings, qualitative structural factor analysis, which can predict the economic and innovative trends of national development in a globally uncertain environment, is becoming increasingly relevant.

A significant natural resource potential always encourages countries to start their intensive exploitation, consumption and export, preserve traditional technologies, promote monopolization of markets, corruption, etc. This, in turn, reduces motivation for innovation and innovative activity itself, and hinders the development of new creative industries.

Most resource-rich countries claiming global competitiveness dispose of a wide range of conceptual approaches and models of economic development. However, it is vitally important for them to decide on whether to pursue exploitation of traditional raw materials or implement innovative strategies. Indicative is the essential comparative characteristics of the relevant models here (Table 2).

In Europe, the Europe 2020 strategy to promote crisis, smart, sustainable and inclusive growth was launched in 2010. The strategy emphasizes that elements of structural weakness are low R&D spending, market barriers and under-utilization of information and computer technologies. The EU Seven-Year Framework Program (Horizon 2020) has received the largest budget ever to implement this agenda in 2014-2020. Adopted by South-East Europe Strategy 2020, modeled on the example of a similar EU strategy, which aims at intensifying the preparation of countries for their future accession to the EU [9].

Japan is one of the countries with huge R&D expenditures, but its self-reliance has been shaken not only by the triple Fukushima disaster of 2011, but also by its inability to curb deflation, which has suppressed the economy for the past 20 years. Introduced in 2013, Japan's accelerated growth strategy is hampered by the reluctance of Japanese firms to increase R&D spending or staff salaries and take risks to launch a new growth cycle [10].

The Republic of Korea has survived the global financial crisis fairly well, but is now experiencing fierce competition from China and Japan, country's exports are stalling, and global demand is shifting towards green growth. Like Japan in overseas markets, South Korea faces a demographic problem that

Table 2

**Characteristic features of raw materials and innovative models of economic development**

| Characteristic features | Raw materials model of economic development | Innovative model of economic development |
|---|---|---|
| Factor priority | Development and export of non-renewable natural resources | The development and implementation of creative potential workforce |
| Production structure | Traditionally, preserved | Continuous diversification |
| Science-intensive | Lack of demand for science and limited demand for highly skilled staff | Increasing demand for science and highly skilled staff |
| Institutionality | Lack of institutional basis for innovative development | Development of the institutional basis for innovative development |
| The level of monopoly | The tendency to monopolize the production and export of raw materials | The absence of a monopoly on the development and production of new products and services |
| Sociality | Increasing social polarization | Increase in the share of the middle class |
| Democracy | Barriers to the formation of civil society | Increasing the role of civil society in economic and political life |
| The role of the state | The state as an expression of the interests of raw materials monopolies | The state as an active participant in the innovation process |

*Source: compiled on the basis of the data [8]*

puts at risk the long-term prospects of economic development, but is determined to pursue the path towards low-carbon «green» economic growth with focus on «creative economy» by setting up new creative industries.

Among the BRICS countries (Brazil, Russia, India, China and South Africa), China managed to avoid the effects of the global financial and economic crisis of 2008-2009, but it has been experiencing economic tensions since mid-2015. Government spending has been a driving force for China's growth until recently, but since the plunge in investor confidence in August 2015, China's desire to move from export-oriented growth to more consumption-based growth has been called into question. The country's political leadership is concerned that massive investment in R&D over the last decade has not brought the expected return.

Brazil has recently been facing a recession. That is why, despite widening access to higher education and increasing social spending, productivity remains low, that is, they still cannot successfully use innovation to ensure economic growth.

The Russian Federation is seeking its own strategy of growth by expanding the import substitution program to reduce the country's dependence on technological imports. Implementation of new technology action plans has accelerated in different industrial sectors. However, the government's plans to stimulate innovation in the business sector have been hampered by a downturn driven by a sharp drop in crude oil prices, the imposition of sanctions and a corresponding deterioration in the business climate.

In India, economic growth has remained at an acceptable level (around 5% of GDP) in the last few years, but there is little or no job creation in the country. The country's economy is dominated by the services sector (57%). The government stands for a new economic model based on export-oriented industries. India is gradually becoming a hub for «moderate innovation» thanks to the vast domestic market for products and services aimed at low-income groups such as cheap medicines and cars.

With the end of peak demand for commodities, Latin America has also begun to look for a new growth strategy. Over the last decade, the region has managed to reduce its excessively high levels of economic inequality, but due to falling global demand for commodities, the countries of the continent have experienced stagnation, which in some cases has led to negative economic performance. Latin American countries have no shortage of political initiatives or complex institutional structures to promote the development of science and research, individually or collectively. They have made great strides in population access to higher education, scientific mobility and products. However, only in a few countries has the peak demand for commodities been used to increase technology-based competitiveness.

### 4. Innovative factors of economic growth in the paradigm of sustainable development

Developed countries strive to stimulate the innovative activity of their companies in order to increase their competitiveness, increase labor productivity and employment and, ultimately, increase the welfare of their citizens. Such countries are characterized by the priority of investments in

promising research and development of human capital. These priorities are designed to ensure the achievement of competitive advantages in future areas of growth, for example, in the field of green technologies, energy, environmental and climate protection, human health.

A systematization of the main factors that stimulate or limit of the R&D development in the selected countries is given in Table 3.

Table 3

**Factors that stimulate or limit of the R&D development in the selected countries**

| Factors that stimulate of the R&D development | Countries | Factors that limit of the R&D development | Countries |
|---|---|---|---|
| Rational use of the existing potential for innovative development | Finland | Weak involvement of small businesses in innovation | The Netherlands, France, Japan |
| Targeted support for key areas of the R&D development | China, The USA | «Brain drain» | Germany, France |
| A long-term innovation policy | Germany, Spain, Norway, France | Socio-economic imbalances in the development of selected regions of the country | Germany, India, Norway, China |
| Implementation of comprehensive state support for innovative companies | The USA, China | Low share of business in research and development financing | India, the Netherlands, France |
| Effective innovation commercialization programs for both generated and borrowed technologies | Japan, Switzerland | High rate of population aging | The EU countries |
| Actively attracting foreign direct investment of leading multinational corporations | India, Singapore, the Republic of Korea | High level of expenditures on the development of the military-industrial complex | Israel |
| Perfect legislation in the intellectual property protection | The USA | Underdeveloped venture capital markets | Germany |
| Introducing international best practices | India, China, Singapore | A number of challenges related to the commercialization of innovation | Brazil, India, Germany |

*Source: compiled by the authors*

Despite the well-established trends in the structure of global R&D expenditures (Table 4), innovation orientation differs significantly in countries with different income levels.

Table 4

**Share of country groups in global R&D expenditures, %**

| | R&D expenditures, bln USD | | | | Share of world R&D expenditures, % | | | |
|---|---|---|---|---|---|---|---|---|
| | **2012** | **2014** | **2016** | **2018** | **2012** | **2014** | **2016** | **2018** |
| High-income countries | 902.4 | 926.7 | 972.8 | 1 024.0 | 79.7 | 75.6 | 72.6 | 69.3 |
| Upper-middle income countries | 181.8 | 243.9 | 303.9 | 381.8 | 16.1 | 19.9 | 22.7 | 25.8 |
| Lower-middle income countries | 46.2 | 52.5 | 60.2 | 68.0 | 4.1 | 4.3 | 4.5 | 4.6 |
| Low income countries | 1.9 | 2.5 | 3.2 | 3.9 | 0.2 | 0.2 | 0.2 | 0.3 |
| The world | 1 132.3 | 1 225.5 | 1 340.5 | 1 477.7 | 100.0 | 100.0 | 100.0 | 100.0 |

*Source: compiled on the basis of the data [21]*

UNESCO experts say that long-term development plans for 2020-2030 in many low– and middle-income countries reflect a search for growth strategies that can turn them into higher-income countries. Conceptual papers by experts typically focus on three areas: reforming management to improve business environment and attract foreign investment with a view to developing a dynamic private sector, achieving more inclusive growth against the backdrop of reducing poverty and inequality, and ensuring environmental sustainability [21].

The processes of economic regionalization have a significant influence on the formation of national innovation strategies. Together with the EU, joint initiatives in the field of innovative development are being implemented:

– The Asia-Pacific Economic Cooperation (APEC Growth Strategy (2010); «Declaration on Action for the Development of an Energy Efficient and Low-Carbon Economy» (2011); «Science, Technology and Innovation Partnership Policy» (2012); «Open Platform Initiative Innovation» (2011); Initiative «Creating a Green Technology Network to Support SME Development» (2012); «Smart Cities Development Forum» (2012);

– The Association of Southeast Asian Nations (Krabi Initiatives 2010); Action Plan For Science and Technology (latest plan from 2011); Regular Summits of Ministers for Science and Technology (2012);

– The Organization for Economic Co-operation and Development (OECD Innovation Strategy, 2010); OECD initiatives («New Approaches to Economic Issues», «Horizontal Development», «National Development», «Global Development»); thematic forums and conferences, etc.

In a situation of exacerbation of global social and environmental problems, the organizational ability of countries to transform knowledge and innovation into higher productivity in the paradigm of sustainable development is of fundamental importance [20]. It should be noted that the concept of sustainable development is constantly evolving, as evidenced in particular by the major international conferences (summits) on these issues. At the same time, it is important to remember that there are certain controversies regarding a number of criteria for innovative progress and sustainable development:

– The United Nations Conference on the Human Environment (Stockholm, Sweden, 1972);

– The United Nations Conference on the Environment and Development (Rio de Janeiro, Brazil, 1992);

– The UN Millennium Summit (New York, USA, 2000);

– The United Nations Conference on Sustainable Development, Rio + 20 (Rio de Janeiro, Brazil, 2012);

– The UN Post-2015 Development Summit (Post-2015) (New York, USA, 2015), etc.

At the same time, it is important to remember that there are certain controversies regarding a number of criteria for innovative progress and sustainable development:

– continuity of innovative progress is confronted with the time-bound nature of models, programs and projects of sustainable development;

– local and individual determinacy of inventions opposes global extra-territorial dissemination of technological advances;

– priority of breakthrough innovation and personal ambition faces the achievement of not only scientific and technological, but also economic, social and environmental results;

– intrinsic value of new knowledge and academic image opposes the importance of commercialized knowledge in terms of contemporary needs;

– material and moral comfort and status of creative activity are confronted with material and moral underestimation of intelligence and «deferred» reward;

– usefulness of both positive and negative result of the empirical confirmation of scientific hypotheses faces the need for mandatory socially positive financial result;

– prognostic potential of the development of scientific ideas and predictions confronts the limited ability to evaluate potentially productive scientific ideas, etc. adequately [4].

Given the theoretical diversity and specificity of foreign practices, researchers highlight a number of conceptual foundations for the development of innovation as a factor of ensuring global competitive leadership such as:

– logical structure with the account of state innovation policy motivation, as well as its subjects and objects;

– functional approach with emphasis on innovative activity functions;

– systemic approach with obligatory identification of interconnected generated elements of innovative activity with their development occurring not only linearly, which can range from basic research to commercialization of new developments and their transformation into innovations, but also at any stage of the innovation life cycle by attracting missing elements from the global innovation system [3].

It should be noted that the latter approach is crucial primarily for economies objectively unable to ensure complete renewable innovation process, i.e. for economies that are not self-sufficient in terms of innovation.

A key institutional component of macroeconomic dynamics ensuring policy is a national innovation system that:

– institutionalizes generation, perception and implementation of new ideas in various fields of human activity;

– creates an effective long-term mechanism of social self-development, enhances its adaptive potential and capacity for progressive structural change;

– contributes to a more rapid increase in factor productivity and effective interaction between education, science, business, governmental and public institutions;

– directs innovation processes to the implementation of national priorities of socio-economic development, enhances the competitiveness of national economies in the global environment [6].

National innovation efficiency (obtaining new established competitive advantages in specific segments of the global market thanks to good positioning in global investment, production and logistics networks) is achieved under the condition of high innovation capacity of the nation. It means that the country's scientific, technical, educational and information infrastructures must be able to provide full innovation cycle with own organizational and regulatory resources and internationally diversified knowledge and financial sources [14].

## 4. Conclusions

Thus, evolution of modern doctrines of economic development in the 21st century has led to a qualitative change in:

– key goals (focusing not only on economic growth, traditional inequality and poverty issues, but also on human development, institutionalization and crisis management);

– national and regional strategies (identifying and taking into account global development imperatives along with finding ways forward for developing countries);

– theories (the prevalence of neo-liberal concepts has transformed into an obvious priority of the global political economy of institutional development);

– models and methods of research and justification (econometric analysis is increasingly replaced by empirical programs).

This substantially alters both the methodology and development strategies and practices of particular countries, the economic policies of which must take into account the latest development imperatives. Today, after the crisis, the traditional economic model is being gradually abandoned. In recent years this model has been characterized by the following features: support for aggregate demand with growing credit and debt, ten times bigger growth in financial assets than in real ones, stable employment in developed countries, currency system with confidence in USD, export of cheap goods and services by export-oriented developing countries, and mass, flexible and over-productive use of information technologies. Instead, in times of instability and turbulence a new model of global development must be created, related to innovation in socio-economic and political spheres, aimed at increasing the role of legal institutions and civil society in addressing global socio-economic and political problems. Priority areas for deve-

lopment are to involve environmental protection, control of the financial sector, and social justice.

In the future, global progress will be ensured by spiritual focus rather than tangible and intangible factors, sustainable development values rather than competitive leadership and other pragmatic motivations, general civilizational perspectives rather than local ones. This, in turn, can be made possible only by the humanization of world economic development on the basis of intellectualization, socialization and greening.

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