

Modernization processes in the modern world: methodology, evolution, tendencies

Procesos de modernización en el mundo moderno: metodología, evolución, tendencias

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ABSTRACT:

The article investigates theoretical, methodological and analytical aspects of developing the modernization processes. To conduct a comprehensive analysis of modernization processes, the author proposes the analysis method that requires the identification of the stages of analysis, systematization of the existing ones, and suggests new indicators. Based on the developed methodology, analytical studies of the features of modernization in different countries are conducted in the context of its separate types (economic, social and environmental). The complex analysis results in the grouping of countries by the level of the activity of modernization processes and the separation of the basic regularities.

Keywords: Modernization, theoretical comprehension, methodology, analysis, tendencies

RESUMEN:

El artículo investiga los aspectos teóricos, metodológicos y analíticos del desarrollo de los procesos de modernización. Para un análisis integral de los procesos de modernización, el autor ofrece un método de análisis que requiere la identificación de las etapas de análisis, la sistematización de los existentes y presenta los indicadores nuevos. Sobre la base de la metodología elaborada, los estudios analíticos de las características de la modernización se realizan en diferentes países en el contexto de sus tipos individuales (económicos, sociales y ambientales). El resultado de un análisis integral es la agrupación de países según el nivel de actividad de los procesos de modernización y la selección de las leyes principales.

Palabras clave: Modernización, comprensión teórica, metodología, análisis, tendencias.

1. Introduction

After the global crisis of 2007-2009, which was predominantly financial in nature, a significant numbers of scientists in the developed countries have started to emphasize the need for modernizing the individual areas of the life of the society to achieve the balance in economy. As a result, nowadays the New economic policy is emerging in the developed countries and it is aimed at addressing systemic, actual concerns based on the introduction of modern tools of modernization. Therefore, the Strategy "EUROPE 2020: Strategy for smart, sustainable and inclusive growth" has been developed in Europe. The document provides for the restoration of industrial output, which is the basis for increasing the competitiveness of the European economy. The United States has repeatedly emphasized the need for neo-industrialization. The tasks of modernization for developing countries are becoming even more important as they determine their ability to catch up on the developed countries.

The many-sidedness of the investigated processes is confirmed by the fact that the ideas of modernization are visible, in particular, in the writings of D. Bell (2004), sociologists Z. Bauman (2005) and M. Weber (2013), H. Welsel and P. Inglehart (2005, 2008), political scientist S. Lipset (1959, 1960), economist V. Rostow (1991) and others.

Despite the fact that the original sources of modernization reach to the depths of centuries the modern complex vision actively began to form in the middle of the twentieth century. Among the main historical prerequisites for the spread of modernization processes in the world, A. So (1991) stated the political changes that took place in the world after the Second World War. So, for the limitation of the spread of the communist movement, the United States, as a leader in the global economy, actively financed the industrialization in countries in Western Europe (Marshall Plan), Japan and South Korea.

After the collapse of the European colonial powers in Asia, Africa and Latin America, the created countries were looking actively for the development models and attempted to conduct modernization. Accordingly, the modernization theory, as a self-dependent direction of scientific investigation, was detached in the mid-1950s. It was constantly criticized because representatives of other schools also studied separate issues of the nature of the economic development, in particular, the theory of dependence, world system and globalization, the comparison of which is presented in G. Reyes (2001).

The purpose of the article is to investigate the modernization processes in different countries of the world based on the systemized theoretical and developed methodological provisions within the context of determining strategically oriented tasks in this field.

2. Methodology

Among the literature existing in modern scientific Ch. He (2012) and V. Lyashenko (2015), two main methodological approaches to the analysis of modernization processes should be distinguished. The first approach is based on the concept of sustainable development and involves the calculation of indicators that correlate economic productivity with the environmental performance. The second approach involves the calculation of aggregate indicators in the context of certain types of modernization and the formation an integral integrated indicator on this basis.

By setting **the goal** to conduct a complex research of modernization processes in different countries of the world for determining their peculiarities, and by summing up the existing methodological developments, one should take into consideration, that modernization processes are difficult to assess because *firstly*, they have both quantitative and qualitative characteristics, and therefore any quantitative research does not fully reflect actual processes; *secondly*, the modernization processes are complex and multifaceted, and therefore the choice of components and indicators that are being taken for analysis is determined by many factors, such as the depth and scope of the analysis, the research objectives and, eventually, the availability of information; *thirdly*, the investigated processes are of a long-term nature, since the modernization of those or other spheres occurs continuously, but with different dynamics, respectively, the difficult methodological task is the choice of apparatus for the processing of certain indicators and the basis for comparison.

Thus, to ensure the complexity of modernization processes analysis, it is necessary: to determine a list of constituents and to form a list of quantitative indicators for each type of modernization; to consider the interconnections between the constituents to form a general idea of the orientation of modernization processes in general and of individual types; to determine the peculiarities of implemented models of modernization processes activation in certain countries.

To develop of a methodology for analysing the modernization processes of the national economy, existing theoretical approaches to understanding the essence and constituents of the investigated process are used and a set of systematized indicators according to the type of modernization is presented at Table 1. Both research directions and indicators can supplement the presented list, which will help to improve the quality of the results of the analysis.

Nº	Indicators		
I	Indicators of economic modernization	II	Indicators of social modernization
1	GDP per capita	1	Average life expectancy
2	The share of the population employed in agriculture	2	Urban population (% of total)
3	Share of gross value added created in agriculture	3	The number of physicians per 1000 inhabitants
4	The share of the population employed in industry	4	Child mortality
5	The share of gross value added created in the industrial sector	5	Public health expenditures,% of GDP
6	The share of gross value added created in the field of material production	6	Public expenditures on education,% of GDP
7	The share of gross value added created in the material production sector	7	Literacy rate, adult total (% of people ages 15 and above)
8	The share of the population employed in the services sector	8	Education spending, % of GDP
9	The share of gross value added created in the services sector	9	Education costs per person
10	Gross capital formation (% of GDP)	10	Tertiary education
11	The value of investment per capita	11	Researchers in R&D (per million people)
12	Research and development expenditure (% of GDP)	12	Patent applications
13	The value of research and development expenditure per capita	13	The number of Internet users
III	Indicators of environmental modernization		
1	Consumption of energy per capita	3	CO2 emissions (per capita)
2	Renewable energy consumption per capita	4	Total CO2 emissions

The next difficult methodological task is to determine the methods for processing the information base. Chinese scientists determine the standard value for each indicator. The indexes in breakdown types of modernization are calculated as the ratio of the real value of the indicator to the standard. A generalized index is calculated as an average arithmetic value of partial indexes. Such an approach has its disadvantages, since it takes on the significance of the economic, social and environmental components in the general index of modernization as equal that is debatable. The complexity and the multifaceted nature of the investigated processes necessitates a combination of different methodological approaches.

The proposed algorithm of modernization processes researching at the macro level includes the following steps:

Stage 1. Comparative analysis of modernization level on a particular type. At this stage, for each indicator, it is necessary to calculate the ratio of a specific indicator for each country in a given year to the best value among the sample of countries.

Stage 2. Investigation of the dynamics of partial indicators for all types of modernization. For each type of modernization, a number of indicators are used that cannot be fully used to calculate a generalized indicator or require additional processing to clarify the features of the investigated processes.

Stage 3. Calculation of the generalized index of modernization and research of its tendencies is carried out by means of determining the simple average mean of all its components, in particular, economic, social, environmental and technological indices. A generalized index of modernization, as well as its components, should be determined during certain intervals, for example, in decades. The economic essence of the generalized modernization index is that it reflects the different countries position at different times and in fact characterizes the percentage of rejecting the country's indicators from the comparison base.

3. Results

3.1. The scientific approaches to investigate of modernization

Modernization is a process of multi-dimensional transformations in all spheres of society existence and life, which are characterized by different dynamics, have expressions, both in quantitative indicators, and in qualitative characteristics, are interrelated and need targeted management in order to synchronize changes.

Processing scientific papers devoted to the theoretical comprehension of modernization processes allows distinguishing several approaches that can be taken as the basis for current research in the context of identifying the basic regularities.

Socially oriented approach considers the evolution of social relations as the primary source of the totality of modernization processes.

In the early stages of scientific research, the theory of modernization was considered, mainly, through the prism of the development of society: agrarian, industrial and postindustrial. D. Bell (2004), exploring trends in the development of social order, calls post-industrial society, on the one hand, an objective reality that embodies the results of all changes, and on the other hand, an analytical construct that makes possible to carry out the comprehension of reality. Using the developed principles, he conducts research and juxtaposition preindustrial, industrial and postindustrial societies. Considering the impact of different types of technologies, the human relation to the environment, D. Bell puts the person at the center of his study and examines its place in various types of social relations. The fundamental nature of his work is based on the application of the integrated approach, which allowed considering the role and nature of the impact of science and technology on the transformation of the social structure.

The example of the countries of East Asia shows the complexity of relations between the state and society, as well as the peculiarities of the cultural traditions of the countries of this region in the form of neo-Confucianism. At the same time, the need for forming a balanced view of the role of culture in the economic development of the country is emphasized.

Thus, the processes of modernization are embodied in the development of society and the modernization of social relations. Socio-cultural and religious differences determine the peculiarities of the evolution of social relations in certain countries, but the general tendency of development for individuality, initiative, and leadership becomes of particular importance for the expansion of modernization.

The territorial approach is based on the recognition of the existence of a certain localization of modernization processes in the world, their dynamics

in those or other regions.

Territorially, modernization is associated, first, with the countries of the West, which at the beginning of economic modernization already had the established democratic system, passed the period of the industrial revolution and had the society prepared for the change. However, in time, scientist T. Nicholas (2011) have begun to pay considerable attention to the study of the "non-Western" model of modernization. Today, it is possible to distinguish several specific models formed in different countries.

The modernization in Japan is defined as a process involving two equally important trends of transformation: democratization and industrialization. An important factor of technological modernization became not only foreign technologies, but also institutions in the whole were adapted to the internal conditions by Japanese inventors. South Korea's example is the example of national innovation system building (A. Kasych (2013); I. Tarasenko (2009)).

In Latin America, modernization included, above all, urbanization, liberalization and democratization (W. Loker, 1996). These processes covered a complex set of events, political activities and social forces that transformed social, political and economic landscape in Latin America. Despite these great changes, the problem of mass poverty persists and once again comes to the forefront of the political agenda. A special model of modernization is being built on the territory of China. Thus, K. Fanjun (2009) explores the peculiarities of the modernization processes in China, which has chosen a selective approach based on the use of useful foreign experience and the rejection of ineligible elements. As a result, China has succeeded in building a rather effective model of modernization, the result of the implementation of which is a leap-shaped development, i.e. overcoming the lag behind more developed countries.

Issues relating to the modernization in the context of searching for their own model continue are actively explored by scientists in different countries. At the same time, the process that has arisen in the West was actively adopted by non-western countries, which, based on its addition with own traditions, transform and organize the "world system", which transforms process of modernization into a global process. Thus, A. Martillelli (2005) emphasizes the global peculiarities of modernization, based on the complexity of the processes, and on the other hand, there are various forms of modernization in accordance with the sociocultural features of a country. Consequently, the definition of modernity can mean, in fact, different characteristics of socio-economic systems, allowing their many-sidedness.

The policy-oriented approach raises dependent the dynamics of modernization processes from the political system and the level of development of democracy in the country. A large number of countries until today are currently in a state of searching for a political system that will provide an effective solution to the whole range of socio-economic problems. The alternatives are quite simple and well known – the command-administrative and democratic system. The search relates to the definition of the optimal balance of freedom and democracy for the individual country, as well as the level of state interference in all spheres of the life of the society.

Modernization processes have traditionally been associated with the development of democracy. This direction in the study of modernization processes was launched by S. Lipset's works (1959, 1960), which initiated a scientific discussion about the relationship between modernization and democracy, i.e. the level of democratization of the country. He considered modernization as a manifestation of social conditions that are changing due the expense of the intensification of industrialization and urbanization processes, raising incomes and the development of education, and all this in a complex determines the development of democratic culture in the country. The scientist does not conclude the direct dependence of the investigated processes; he emphasizes probabilistic causal relationships when the specified components of economic development ensure the formation of conditions for the democratization of society in the country. In fact, the pioneering work of S. Lipset (1959) have defined a long-standing scientific debate and empirical research on the interrelationships between economic development and democracy.

It is necessary to indicate the works of A. Hadenius (1992), A. Kasych (2016) among the most significant within a politically-oriented approach. Based on the studies of the recommendations of scientists on the implementation of democratic transformations and ensuring the economic development on this basis, the importance of finding the optimal balance between economic and political development of the country should be emphasized.

The reason for the "rollback" from democratization may be failures in socio-economic development. In order for democracy to be stable, the transformations in the country should be systemic. In this context, it is important to study the papers by H. Welzel and R. Inglehart (2008) who sought to find statistical confirmation of the interconnections between modernization processes and democracy. Among the various manifestations of modernization, the focus of the authors focused on the study of liberal aspirations of the population at a massive level. They attempt to explain the extent of changes in political regimes based on the level of modernization.

In the generalized form, the answer to the question what should be primary – democracy or economic growth – the only answer is absent. Democracy has long been perceived by scientists as one of the most important conditions for economic development. However, at present, examples of the development of a number of countries that significantly restrict democracy show the ability of opposed to democratic systems' models, to ensure high economic growth.

Accordingly, each country, especially developing countries, is trying to determine the optimal model of development that would correspond to goals, arrangements, traditions, etc. On the content, this choice means defining a particular proportion between the goals of democratization and socio-economic development.

The most striking example of preserving the authoritarian political system and ensuring the high economic growth is demonstrated by China, the economic system of which is developing under the conditions of the established state capitalism. The success of China puts an agenda on the issue of this model ability to replace the traditional "western" model. Exactly in this aspect, that research in the work of S. Zhao (2010) is presented. The success of China led to the fact that scientists began to define the "Chinese model", the main features of which are copying successful elements of the market economy and the existing system preservation by the ruling party.

After comparing the two systems – democracy and dictatorship – concluded that the speed at which productive factors grow might be higher under a dictatorship, but the use of resources could be more effective under a democracy. The overall effect in the long term may be equal, indicating that there is no difference between these two systems in medium-term growth rates. Accordingly, development models may vary, but average growth rates may be the same. Under such conditions, the population can safely perceive and dictatorship for a long period.

Summarizing all the above-mentioned it is appropriate to affirm that economic development is an important factor in the formation and preservation of democratic societies.

The economic-oriented approach is based, in fact, on the identification of the modernization processes with economic transformations, which are accompanied by positive trends of key macroeconomic indicators.

Theories of economic growth consider it as a combination of factors of production, having quantitative characteristics, first, of labour and capital. However, even if we follow exclusively the theory of economic growth and take into account the fact that the average labour productivity is functionally dependent on the average capital power, it should be emphasized that the quantitative increase of capital assets is due to modernization. Investments play an important role in activating modernization (A. Kasych (2011)).

The basis for solving economic problems, for example in China, was a one-sided technical and technological modernization with the preservation of the political system. China, ignoring the principles of democracy, successfully solves economic problems by modernizing the technical and technological component, and at this stage of development, this model works and provides results.

Thus, sustainable development goals embody the aspiration for well being, but in practice, this also determines the development of society, and thus, the process of finding its own, optimal model for each country will continue.

3.2. Evolution of modernization

With the development of the society, socio-economic and political systems in different countries, the evolution of theoretical opinion of scientists on modernization forms and their influence on the development of some selected countries was experienced.

Using the generalized approaches to the definition of the essence of the notion of "modernization", presented in the works (V. Il'in (2012), N. Obushna (2015)), it is expedient to distinguish several basic stages, which allow tracing the evolution of the modernization theory.

The first stage was the phase of fragmentary research, when representatives of different sectors of science studied some aspects of the modernization process: society or state, and, accordingly, modernization theory was perceived as a component of the development of philosophy, sociology, political science, economics, etc.

The second stage was connected with the development of technological and economic directions of the modernization theory, which was caused by the acceleration of STP and the intensification of industrialization processes, especially in the developed countries.

The third stage was characterized by the convergence of modernization theory elements and the provision of a comprehensive vision of the role of modernization processes in the development of the society as a whole. In many countries of the world, there was a transition to the post-industrial

stage of development, and as a result, the search for new drivers for modernization processes began, in particular, due to the modernization of the education system and cultural environment.

The fourth stage is connected with the intensification of research into the impact of technological modernization processes on the socio-economic dynamics in the developing countries.

The fifth stage of modernization theory development is connected with the further expansion of the understanding of the notion "modernization", which is based on the provisions of the concept of sustainable development, which determines the possibility of general modernization of the society based on the definition of clear causal relationships of individual elements and ensuring a high level of their convergence.

The sixth (modern) stage is characterized by a differentiation of approaches to the development of modernization theory; in the developed countries, after the global economic crisis, the basis of modernization was the formation of a new industrial policy aimed at accelerating modernization, first, in industry; most post-socialist countries are moving through the implementation of a proven "western" model of modernization when economic reforms are carried out in parallel with the democratization of all spheres of social relations; the developing countries should seek for their own models of modernization, which are based on the priority of the goals of economic and technological development.

Thus, each country builds its own model of modernization, the implementation of which provides for development. Among the elements of the modernization model should be distinguished: economy, society, politics, culture, ecology, structure, institutions, etc.

3.3. Dynamics of modernization processes

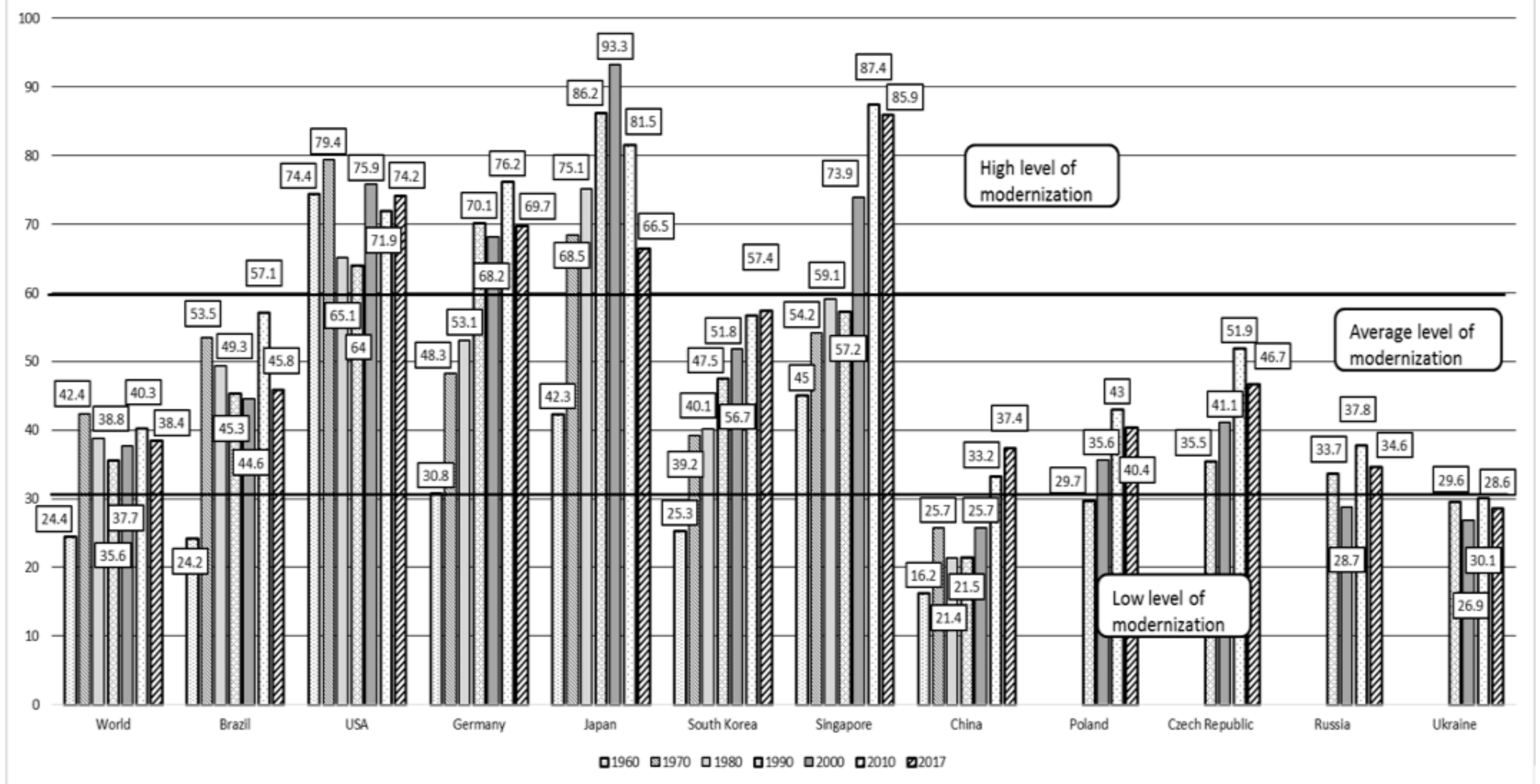
The offered algorithm can be used for research of modernization processes, including at the level of individual companies or regions. The choice of the time horizon during study is important to determine the peculiarities of modernization processes. That is why the data was systematized from the 1960s until 2017. From the point of view of representation, a data set was made in the profiles of the countries, the study of which allows identifying the most significant features and patterns. Twenty countries have been selected, among which there are the developed countries; countries with the status of new industrialized countries; countries with a transitory economy, others. According to the results of processed statistical information, the indexes of economic, social, environmental modernization and modernization in general were calculated (Table 2 and Figure 1).

Table 2
Dynamics of modernization processes in different countries of the world

Countries	Index of economic modernization							The index of social modernization							Indices of environmental modernization						Index of upgrades (by default)							
	1960	1970	1980	1990	2000	2010	2017	1960	1970	1980	1990	2000	2010	2017	1960	1970	1980	1990	2000	2010	2017	1960	1970	1980	1990	2000	2010	2017
World	7.5	14.4	14.6	13.2	14.3	17.8	17.6	57.0	60.8	63.4	65.4	67.7	71.0	71.9	8.7	51.9	38.3	28.3	31.1	32.0	25.8	24.4	42.4	38.8	35.6	37.7	40.3	38.8
Developed countries (the beginning of modernization 1920-1930's)																												
USA	100	86.1	69.0	68.6	94.8	80.7	90.5	91.4	90.2	89.1	88.9	91.0	91.8	91.2	31.7	62.0	37.1	34.5	41.9	43.2	41.0	74.4	79.4	65.1	64.0	75.9	71.9	74.4
Canada	81.7	68.4	61.3	61.1	59.0	88.5	75.4	92.0	92.9	91.4	91.3	92.9	93.8	93.4	33.4	60.2	35.3	33.9	29.4	44.4	33.4	69.0	73.8	62.7	62.1	60.4	75.6	67.7
France	22.2	53.1	73.0	65.9	57.0	73.4	61.5	86.3	89.3	89.0	88.8	90.1	91.7	91.8	44.1	85.9	85.6	74.4	65.7	82.5	64.2	50.9	76.1	82.5	76.4	70.9	82.5	72.2
Germany	m.d.	55.0	71.1	67.7	62.1	71.6	64.8	92.4	89.8	88.3	87.9	88.3	89.1	89.1	m.d.	m.d.	m.d.	54.8	54.1	68.0	55.1	30.8	48.3	53.1	70.1	68.2	76.2	69.3
UK	43.6	39.9	51.8	55.3	63.4	60.9	66.7	97.9	93.5	92.3	91.4	91.7	93.5	93.4	24.8	53.9	63.8	57.3	65.5	75.9	78.1	55.4	62.4	69.3	68.0	73.5	76.8	79.3
Sweden	74.3	94.5	100	100	74.9	95.9	89.3	96.2	98.1	96.0	95.2	95.9	96.2	95.7	46.2	94.7	97.2	88.7	80.0	90.4	82.9	72.2	95.8	97.7	94.6	83.6	94.2	89.3
Developed countries (the beginning of modernization 1950's)																												
Israel	42.0	33.7	30.2	34.6	53.6	51.0	56.4	98.6	98.2	99.0	99.3	99.6	100	99.3	26.8	84.0	64.3	46.9	60.7	60.6	57.4	55.8	72.0	64.5	60.3	71.3	70.5	71.3
Japan	8.0	44.1	59.8	87.5	100	73.9	54.8	86.5	90.8	93.0	92.8	93.1	99.2	100	32.4	70.7	72.4	78.4	86.8	71.4	44.7	42.3	68.5	75.1	86.2	93.3	81.5	66.3
Developing countries (Latin America)																												
Argentina	0.0	22.9	15.6	10.5	16.9	17.2	20.2	90.8	90.7	91.8	92.9	94.0	94.5	94.1	0.0	89.8	43.2	34.3	44.3	34.9	36.1	30.3	67.8	50.2	45.9	51.7	48.9	50.0
Brazil	6.5	7.1	10.5	8.6	8.8	18.7	13.1	66.1	72.3	77.0	81.5	87.2	89.6	89.7	m.d.	81.2	60.3	45.7	37.9	63.0	34.6	24.2	53.5	49.3	45.3	44.6	57.1	45.3
Mexico	10.3	11.5	16.5	9.1	16.9	16.0	15.4	71.0	76.0	80.4	84.2	86.9	88.6	88.6	m.d.	77.1	46.4	23.6	42.9	37.7	29.1	27.1	54.9	47.8	39.0	48.9	47.4	44.4
Developing countries (NIS)																												
South Korea	3.9	5.0	11.0	24.0	37.0	48.5	52.3	53.2	64.8	74.0	85.2	90.2	93.0	93.1	18.7	47.7	35.3	33.3	28.3	28.7	26.9	25.3	39.2	40.1	47.5	51.8	56.7	57.3
Singapore	10.6	20.2	38.5	43.4	76.2	94.7	97.4	93.8	95.0	97.4	98.2	98.9	99.7	100	30.6	47.4	41.3	29.9	46.7	67.8	60.3	45.0	54.2	59.1	57.2	73.9	87.4	85.3
Developing countries (Asia)																												
Turkey	12.1	7.0	7.7	8.5	10.3	17.3	14.2	49.9	57.0	62.4	72.6	78.2	82.9	83.9	100	91.3	52.6	30.6	31.0	42.3	28.5	54.0	51.8	40.9	37.2	39.8	47.5	42.3
India	2.3	1.6	1.3	1.1	1.2	3.3	3.4	40.8	45.1	49.6	52.1	55.0	57.9	58.9	19.4	57.1	28.4	12.8	10.4	15.7	12.8	20.8	34.6	26.4	22.0	22.2	25.6	25.6
China	4.1	2.3	1.3	1.2	3.1	12.6	20.3	39.8	49.7	55.2	59.0	64.8	72.9	75.9	4.6	25.2	7.6	4.4	9.1	14.0	16.0	16.2	25.7	21.4	21.5	25.7	33.2	37.3
Transitive economics																												
Poland	m.d.	m.d.	m.d.	5.1	11.9	22.4	20.4	76.1	77.0	77.6	77.7	78.7	78.4	77.9	m.d.	m.d.	m.d.	6.2	16.1	28.1	23.0	m.d.	m.d.	m.d.	29.7	35.6	43.0	40.0
Czech Republic	m.d.	m.d.	m.d.	11.8	18.1	39.7	32.0	85.4	84.0	87.8	86.1	91.9	86.6	85.8	m.d.	m.d.	m.d.	8.7	13.4	29.5	22.2	m.d.	m.d.	m.d.	35.5	41.1	51.9	46.3
Russia	m.d.	m.d.	m.d.	11.7	4.1	19.5	14.9	77.9	80.8	81.1	82.6	78.2	79.7	79.9	m.d.	m.d.	m.d.	6.7	3.9	14.2	8.9	m.d.	m.d.	m.d.	33.7	28.7	37.8	34.4
Ukraine	m.d.	m.d.	m.d.	5.0	1.5	5.1	3.1	75.9	78.5	78.4	80.2	76.9	78.5	78.5	m.d.	m.d.	m.d.	3.6	2.2	6.7	4.2	m.d.	m.d.	m.d.	29.6	26.9	30.1	28.3

Source: Compiled by the authors according The World Bank
m.d. – missing data

Figure 1
Dynamics of the index of modernization of countries of the world



Economic upgrading should be investigated in terms of effective, structural and resource aspects. Thus, GDP per capita is one of the most indicative indicators including the processes of economic modernization. Considering the GDP growth and the change in GDP in the decade of each country the periods of the most effective modernization can be defined. The world economy grew most dynamically in the 1960s and 1970s. According to authors' calculations, from the beginning of the 1960s to 2015, the world's GDP grew in 22 times. Approximately the same increase in GDP occurred in the developed countries: in 18 times in the USA and Canada, in 31 times in the UK, and in 25 times in Sweden. Confirmation of more high dynamic of the modernization process was GDP growth in Japan in 67 times, Singapore – 123 times, and South Korea – 175 times. The 1960s and 1970s were the most dynamic in the development of Japan. The most effectiveness of modernization in South Korea dates back to the 1970s and 1980s, and in China there was been shown a remarkable modernization during the 1970s. That is, in the development of each country, it is possible to distinguish periods of dynamic modernization, which was accompanied by relatively high rates of GDP growth and it ensured an n-fold increase in GDP. The structural analysis of the gross value added conducted in terms of the main economics sectors for the period under review confirms:

- an overall tendency to reduce the importance of agriculture, whose share in world GDP in 1990 was 8.1% and decreased to 3.9% in 2015. The GDP share should be considered as an indicator of the modernization level of the economy. Thus, in the developed countries, this figure did not exceed 2% of GDP in 2015, and countries whose development is based on, including in the agriculture, are less upgraded. The share of gross value added of agriculture in GDP in 2015 was 6% in Argentina, 5% in Brazil, 8.6% in Turkey, 8.9% in China, and 14% in Ukraine;
- the growth of the services significance, the share of which in the value of gross value added can be considered an indicator of the activity of modernization processes. The increase in this indicator to the 45-50% level indicates a certain maturity of the industrialization processes, and due to ongoing modernization, the share of services, primarily in developed countries, grows up to 75-78% (USA, Germany, France, Singapore, and others);
- the preservation of general economic significance of the industry, the share of which in the gross value added is gradually decreasing. Accordingly, in order to ensure overall economic growth, the modernization of industry should be intensified.

Modernization largely depends on the available resources that aim at economic development. Investment and human resources are the most significant.

To analyze the investment activity it is appropriate to use such indicators as gross fixed capital formation (% of GDP), research and development expenditure (% of GDP), gross fixed capital formation per capita, gross fixed capital formation (annual % growth), number of researchers, efficient use of intellectual property, etc. The share of GDP directed towards the investment and investment on R&D is an important, albeit relative, indicator of modernization processes. This indicator was 20-25% of world GDP for the researched period globally. This indicator, despite the slight dynamics, in the developed countries remains at the same level. That is, the financing of modernization processes is supported even in the conditions of reaching a certain level of development. Greater amplitude of this indicator is characteristic for the developing countries: at the initial stages of modernization, it was 9-15% and gradually increased to 35-45%.

Modernization in China comes at the expense that the gross fixed capital formation (% of GDP) accounts from 33 to 47% annually. Such an investment policy has a clearly expressed modernization character and it has ensured an increase in the value of investments from 35 to 3660 dollars US per capita. China's investment per capita accounts only 30% of the value of investments in the US, Canada, but already almost half of the amount invested in South Korea or Japan. The investment activity level in the developing countries, with using absolute and relative indicators, is much lower than the presented positive examples. It means that Argentina, Brazil, Turkey, India, and others can stay in the peripheral position.

Thus, countries that have come onto the way of modernization should actively use the investment policy tools and ensure the priority redistribution of GDP is for investing. A number of the developed and the developing countries demonstrate quantitative benchmarks of these processes.

Social modernization should be considered as a factor and the result of economic modernization. The development of industrial production was reflected in the expansion of urbanization processes, which, in turn, has led to the improvement of the overall socio-cultural level of the population. The increasing of the development level of education and science, medicine leads to an increase in life expectancy. The significance of the latter factors is most effective since, with the background of approximately the same level of urbanization, despite significant differences in the level of development of education and medicine in different countries, certain differences in life expectancy persist.

In general, the differences between countries according to the index of social modernization are not as significant as in terms of the economic modernization level. Thus, the public expenditure on education (as a percentage of GDP) in most of the countries studied is between 4% and 8%. Education is given special attention in all countries, and countries that are on the path of modernization, above all, increase the amount of education financing accompanied by an increasing in the share of these expenditures in GDP and the level of education of the population. There are significant differences in financing the health care. The USA has the highest rate (17% in 2014), with about 5% in Argentina, Singapore, Turkey and China. This indicator, which reflects the state's relation to an individual as a person, should be considered one of the most indicative indicators of social modernization.

Ecological modernization in recent years is particularly important at all levels of the study of economic processes. It is based on the environmental modernization indicators and can be concluded regarding the modernization of public accountability. To obtain generalized ecological modernization indexes indicators were calculated per 1 resident, which made them more comparable. The presented indicators demonstrate the significant differences in the content and quantitative characteristics of environmental policy in different countries. Moreover, the situation does not change significantly: economic modernization does not lead to proportional dynamics of indicators of environmental modernization. Thus, the value of the environmental modernization indexes in some even developed countries does not change significantly, for example, in the US, Canada, Japan, and others. Insignificant changes took place in the environmental modernization of China and India. The index of modernization is a profile of the updating and upgrading processes in all spheres of activity and processes of the country functioning at a certain point in time. It also allows tracking the dynamics of the

modernization of individual countries in comparison with others.

In general, the countries under study, according to the modernization level, can be divided into the following groups (Figure 1):

a) countries with a high level of modernization processes activity (the index is more than 60 units). This group includes the United States, Canada, France, Germany, United Kingdom, Sweden, Israel, Japan, and others. Significantly, almost all of these countries occupied a leading position in various decades.

b) countries with an average level of modernization processes activity (the index ranges from 40 to 59 units out of 100 possible). The group is represented by countries such as Argentina, Brazil, South Korea, Turkey, Poland, Czech Republic. That is, the group is represented by countries that almost reach the levels of highly developed countries such as South Korea, Poland, and countries characterized by slowing down the modernization processes, even compared with previous decades;

c) countries that are characterized by the low level of modernization (index of modernization is less than 40 units). The fact that China has remained among the countries of this group is the fact that not all spheres of human life and the economic sector have reached a sufficient level of development. In general, the world economy is characterized by a low level of modernity. This means that even due to the activation of modernization in many countries, it is not possible to change significantly the ratio in the overall distribution of forces in the world economy. This situation has been preserved for several decades.

The conducted research allowed distinguishing the **main regularities of the modernization processes** development in general.

1. Modernization is effective only when it has a target orientation and takes on the signs of complexity and systemicity. In the overwhelming majority of countries, the starting point for modernization was the formation of a national idea and a long-term development program (strategy). The combination and implementation of economic and social goals ensured the gradual modernization of the entire system. The economic basis of the national idea led to quite dynamic changes in the development of many countries.

2. Implementation of the modernization strategy requires the mobilization of the existing and development of the necessary resources in accordance with the stage and the type of modernization. Modernization in different countries was carried out in conditions of different resource support. In cases where the system does not have sufficient resources, its efforts should be directed towards the development of resource potential: raising the level of investment activity, activating the development of education and science, and democratizing the development of society.

3. Some imbalance in the modernization dynamics of various types persists. Countries – world leaders in economic and social modernization lag behind indicators of environmental modernization, indicating the ignoring the environmental goals of the global economy. As a result, the indexes of environmental modernization during the investigated period remain at the same level or increase only marginally.

4. Different groups of countries began to modernize at different times and have demonstrated that this dynamics of modernization processes provides a real catching up the global leaders. In addition, for global leaders, modernization ensures maintaining the positions. The most significant results, for example, in economic modernization, have been achieved by Japan with 8% compliance with the best indicators of modernization in 1960 and leading positions already in 2000; South Korea from 4% of the level of maximum modernization in 1960 to the level of 52.3%. On the other hand, there are a number of countries that even attempting to implement certain reforms remain unmoderned or partially upgraded, in particular, Brazil, Mexico, India, and Ukraine as an indicator of economic modernization.

5. As a basic modernization model for many developing countries, the traditional "westernization" was proposed, which envisaged initially the implementation of the principles of democratization (political modernization) and, on this basis, the formation of real conditions for phased technological and economic modernization. Thus, in the work of H. Weltsel and R. Inglehart (2005) the authors present even the comparison of the duration of the existence of democracy in certain economic conditions, and it is defined how much democracy would last at given level of GDP. It should be emphasized that a certain number of the developing countries have become the conduit for a fundamentally different approach: they were able to carry out technological modernization and significantly increase the socio-economic living standards without reforming the political system and without real society democratization. That has become an example of another, compared with developed countries, model of implementing the concept of modernization, albeit fragmentary. The population in these countries agrees to have economic results without the implementation of political modernization, which means that the correlation between individual types of modernization is not so direct. In general, each country finds its own model - a combination of components of modernization processes, and therefore the issue what is the primary: economic and technological modernization or political and social remains open.

4. Conclusions

The most important feature of modernization is its complex mutually supportive character: economic modernization is impossible without the development of science, and modernization of science takes place exclusively because of modernization of education and society in the whole.

Modernization involves not only dramatic changes, but also small transformations, because it is impossible to maintain the same pace of change during a long period. The contradiction between the quantitative and qualitative characteristics of individual components of modernization processes leads to aggravation of other problems and may be accompanied by systemic crises. To orient the modernization to advanced benchmarks and to synchronize all modernization processes in the country's economy a strategic approach should be used, that is, to develop an appropriate strategy.

The specific economic conditions in which the country begins to implement reforms influence the choice of model or strategy of modernization that is why it is important to conduct a comprehensive study and an objective assessment of the situation in the country, which will determine the reality of ensuring the necessary dynamics of modernization.

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