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BACKGROUND OF HUMAN CAPITAL DEVELOPMENT IN THE CONTEXT OF FORMING THE ECONOMY OF KNOWLEDGE

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Abstract

The general definition of human capital has been given, the most important factors of influence on it regardless of the hierarchical level of the economic system, namely education and health, have been indicated in the article.

The stages of the human capital development from the basic to the innovative one have been identified and the important internal human factors that can be influenced from the outside, reinforcing them, which will influence the increase of the level of human capital have been emphasized.

The Global Human Capital Report of the World Economic Forum in 2017 has been analyzed in order to identify the place of Ukraine and its determinants, as compared to countries, the highest level of human capital in the world. This allowed identifying the problems of human capital development in Ukraine and the corresponding directions of their overcoming. The main problems include: lowering the welfare and quality of life of the population; departure of highly skilled specialists abroad; the reduction of employment opportunities in the specialty due to the low qualification and inconsistency of the received education with the demanded occupations in the labor market, which are changing on a global scale. To overcome these problems, it is important to create certain preconditions at different hierarchical levels of the economic system in the context of the knowledge economy formation. At macro level, the prerequisites for the human capital development include: implementation of measures to overcome corruption; the revival of morality and the general culture of society; creation of a favorable innovation climate and an innovative culture of the country's population; maintenance of domestic commodity producers; development and implementation of effective intellectual property rights protection instruments at the legislative level. On the meso-level, such preconditions are: the development of higher and special vocational education in the branch directions; development of innovation infrastructure; distribution of clusters for business development; the maintenance of domestic commodity producers. At micro level, the above-mentioned prerequisites include: scientific approach to the organization of work; modern quality and efficient management system and relevant organizational structure and system of labor motivation and stimulation; introduction of innovative approaches, methods, tools in all areas of activity.

Keywords: economy of knowledge, human capital, human capital development, entrepreneurship, human capital development stages, innovative human capital.

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1. Introduction

In a post-industrial society which is identified as a “knowledge society”, services that are designed to meet the ever-more diverse needs of people and society become the main value. This requires the change of technology to the scientific and intellectual, key productive resources for which are information and knowledge [1, p. 84]. Such transformation implies an increase in the role of human capital and innovation in the formation of knowledge economy, which is closely and inseparably linked with entrepreneurial initiative [2, p.137].

The founder of the human capital theory is Theodore Schultz, an American scholar, economist, professor at the University of Chicago, who first used the phrase “human capital” [3]. In his studies on the example of America, and rapid recovery in post-war Japan and Germany, he proved that the prosperity of the state is not based on the real capital (minerals, banks richness), and the human capital (educated and healthy people in the country) [4]. From these studies the “theory of human capital” started, which received international recognition, as evidenced by the award of the 1979 Nobel Prize in Economics for “pioneering research of economic structure of developing countries”.

The most productive follower of T. Schulz was Gary Stanley Becker, who in his writings “Investing in human capital: theoretical analysis” (1962) [5] and “Human capital: theoretical and em-

pirical analysis with a special emphasis on education” (1993) [6] gave a holistic scheme and explained human behavior from an economic point of view. The scientist argued that investing in human capital is more profitable than investing in securities. Becker was the first to make a statistically correct calculation of the investment in education efficiency. For his research results in 1992, he received the Nobel Prize in Economic Sciences “for having extended the domain of microeconomic analysis to a wide range of human behaviour and interaction, including nonmarket behaviour”.

The following scientists have made a significant contribution to the formation of the human capital theory in modern science: O. Grishnova has thoroughly investigated problems of the human capital formation and development at various hierarchical levels of economic system and determined the factors of its growth at these levels; has substantiated the interconnection of human capital with intellectual and social capital, proposed approaches to evaluation; has identified ways to preserve human capital in a crisis [7, 8]; N. Azmiuk has discovered the factors of formation and development the human capital innovative forms [9]; V. Kovalchuk has defined human capital as a powerful factor in the innovation development of economy and proposed an organizational and economic mechanism for investing in human capital in the context of globalization processes intensification [10]; O. Mazina has proposed an approach to assessing the value of human capital taking into account the risks of its dissipation and the possibilities of its preservation and development [11]; O. Levchenko, D. Plynos, O. Tkachuk have made suggestions on the main directions of innovative influence on the processes of human capital formation and development in Ukraine [12]; A. Osiychuk has highlighted the role of the institutional system in the human capital formation and development [13].

Human capital is closely connected with socio-economic development and is one of the determinants of such development in the works of modern scientists. At the same time, the problems of human capital development in the modern conditions of knowledge economy formation, which is possible in case of creating certain prerequisites at different hierarchical levels of the economic system, are still unresolved.

2. Aim of research

Determine the preconditions for the human capital development in the context of knowledge economy formation.

3. Research methods

The research is based on the use of the system approach basic provisions. To solve the problem of determining the preconditions for the development of human capital in the conditions of knowledge economy formation, general scientific and special methods of processes and phenomena research in their interconnection and development are used, namely:

- dialectic, analysis and synthesis, induction and deduction;
- system-structural analysis (with allocation of factors of influence on human capital);
- structural-logical analysis (in identifying the stages of human capital development);
- comparative analysis (comparing Ukraine’s ranking with other countries and identifying problems of human capital development);
- logical generalization (in determining the preconditions for the development of human capital in modern conditions).

4. Results

In general, human capital, regardless of the economic system hierarchical level, is understood as a result of investment and a certain stock of health, knowledge, skills, abilities and other productive qualities accumulated by people, formed or developed, which, under the influence of external and internal factors, are purposefully used to create added value, income growth, welfare and quality of life.

Factors influencing the development of human capital are divided into internal in relation to a person, caused by a person himself, and external ones (conditions of development) [9, p. 48; 11, p. 17].

The most important factors, starting with the studies of classics and resuming with the conclusions of modern scholars, include the level of people's education and health. Moreover, these factors are considered both internal and external. Modern researchers make a decisive emphasis on education. So, O. M. Levchenko, D. D. Plinokos, O. V. Tkachuk under the conditions of innovative development (which is at the same time a prerequisite and result of the knowledge economy formation – *author's note*), distinguish education as the most important factor influencing the formation of human capital and, accordingly, economic development and GDP, two thirds of which are created in the world due to human capital [12, p. 6]. N. Azmuk argues that high education contributes to the increase of labor productivity and higher individual income, which, in turn, leads to an increase in consumer spending and market demand, an incentive for development and, as a result, accelerates economic growth [9, p. 49]. For advanced economies, this thesis is confirmed by the results of a study by the World Economic Forum [14] published in the Global Human Capital Report, 2017. In this study, human capital incorporates the knowledge and skills of people, which makes it possible to create value in the global economic system. We emphasize that the knowledge and skills that a person owns cannot be considered as capital, if their implementation does not create value. This principle extends to other hierarchical levels of the economic system (from the global to the individual entity level).

That is, human capital exists only if human labor is applied in the socio-economic conditions (at the level of the enterprise, industry, region, country, global economy) and the creation of its added value and, accordingly, the receipt of income as a carrier of human capital (in the form of wages for hired workers or income for entrepreneurs to do their own business) and the enterprise, region, country, world (GDP growth, GNP, national wealth, welfare and quality of life).

The Global Human Capital Index 2017 assesses human capital globally in four areas from which we identified the stages of human capital development (**Table 1**).

Table 1

Evaluation criteria and stages of human capital development

Evaluation criterion	Explanation	Stages of human capital development
Capacity	The level of formal education for younger and older generations as a result of past investment in education	Getting education, basic knowledge
Deployment	Applying qualifications and skills accumulating among adults	Accumulating knowledge in the process of work, knowledge and skills consolidation
Development	Formal education of the new generation of labor force and continuing education through advanced training and retraining of the current workforce	Experience, maturity, continuous improvement
Know-how	Width and depth of using special skills in work	New higher quality of knowledge and skills, creativity, new opportunities for applying knowledge, higher innovative thinking, innovative human capital

Source: systematized by the author on the basis of [14]

It should be noted that for the gradual creation of higher, innovative thinking, the highest innovative level of human capital, we need the following: strong internal motivation, high responsibility, discipline, constant self-improvement through self-regulation, self-organization, self-education (the application of system principles of human being as a carrier of human capital), and high spirituality. These are internal factors of human capital development, which may also be influenced by external stimuli.

The Global Human Capital Index 2017 estimates 130 countries according to how they develop human capital in their countries (**Table 2**).

In general, according to the World Economic Forum, only 62 % of the world's human capital is currently developing [14]. The greatest productivity of human capital in the world occurs in such countries as the USA, Germany, Canada, Russia and Japan. Among the European countries with the highest productivity, human capital is used in Finland, Denmark, Sweden, Germany, Slovenia

and Estonia. The main factors contributing to this include: high quality education; employment of older generation specialists in highly qualified professions; qualitative systems of vocational education and training of the personnel.

Table 2

The ranking of countries according to the Global Human Capital Index 2017

Country	Global Human Capital Index	Ranking	Characteristics
Norway	77.12	1	The most successful country in the world. Highly skilled workers are available. The lowest unemployment rate.
Finland	77.07	2	High level of elementary schools quality as well as the general education system. High level and diversification of professional and higher education. Employment of older generation professionals in highly qualified professions. At the same time, the unemployment rate among young people is 20 %.
Switzerland	76.48	3	High quality education system. However, a gender gap is kept both in the working age and in the older generation.
USA	74.84	4	Developed education system, young people and older people study at universities, high level of graduates' competitiveness. Employment of older generation professionals in highly qualified professions. Low unemployment. At the same time, there is an uneven distribution and polarization of human capital (large low-skilled sector). Low quality of elementary education.
Denmark	74.40	5	High quality of education system.
Germany	74.30	6	Creative and innovative thinking of the workers, developed at the workplace and in the process of advanced training and retraining. Highly educated older generation. Aging population.
New Zealand	74.14	7	High quality of education system.
Sweden	73.95	8	High quality of education system. Creative and innovative thinking of the workers.
Slovenia	73.33	9	Highly educated older generation.
Austria	73.29	10	High quality professional education, great variety of graduates' skills.
Singapore	73.28	11	The second largest share of highly skilled labor in the world, high-quality education and personnel training. Gender gap.
Estonia	73.13	12	Creative and innovative thinking of the workers.
...
Ukraine	71.27	24	The advantage to investing in higher education of younger generations. Emigration of highly skilled specialists.

Source: formed by the author on the basis of [14]

In Ukraine, the rate of human capital development is more than 70 %, which is much higher than GDP per capita (USD 2185.83 at the official NBU rate [15]).

According to the global index of human development, Ukraine ranks 24th in the World Economic Forum ranking, while the level of investment in education is 5th (index 81.70), by the level of accumulation and improvement of knowledge through advanced training and retraining – 31st place (index 72.65), the level of knowledge extend among adult population – 38th place (index 71.47) and the level of width and depth of special skills using in work also 38th place (index 59.26).

Almost 80 % of population in Ukraine invests in their own higher education (to compare, only 50 % of the population in Japan have higher education, 31 % in the United States, only 10 % and 8 % in China and India respectively have higher education [14]). In the process of working in Ukraine, workers are mainly from 25 to 54 years of age undergoing advanced training and/or retraining in order to develop their own human capital. Employees of younger and early retirement age have less activity in this direction. Yet, according to the level of education and development of professional skills, according to the World Economic Forum, Ukraine has high rates and is close to such countries as Russia, Japan, Germany, and Kazakhstan.

The problem in Ukraine, as well as in other developing countries, is the decline of employment opportunities in the specialty due to the low qualification and inconsistency of the received education with the demanded professions on the labor market, which are changing on a global scale.

Technological changes in the global world affect the transformation of labor markets, which involves changes in the human capital formation and its impact on the socio-economic development of countries, improving the well-being of the population and quality of its life. Today, the most popular among the specialties in the labor market are business administration, law, social sciences, and journalism, information, as well as information and communication technologies. The development of the latter has substantially accelerated today. Mature specialists are dominant in this field in such countries as Sweden, Australia, the United States, Switzerland, and the United Kingdom. Young specialists are predominant in Lithuania, Brazil, Romania, and Estonia. It is interesting that in the Global Human Capital Report 2017 among the LinkedIn (a social network for the search and establishment of business contacts, the information used to formulate the report, the research partner of the World Economic Forum) users, there are no partners from Ukraine. For example, when analyzing the skills of those who have information and communication technologies by age and country, there are no data concerning Ukraine. This shows that this direction of business contacts through the social network LinkedIn, popular in the world, is not used in our country, although it is well-known that Ukrainian IT professionals are in demand in other countries, which speeds up their emigration. Development of business contacts with foreign partners, in turn, is one of the areas of scientific and technical cooperation, generation of new ideas, and innovative development of human capital.

Knowledge, abilities, skills, creativity, tendency to perceive innovations, etc. as the basis of human capital, are the key factors of economic growth, for successful implementation of which the certain prerequisites are needed. In the contest knowledge economy formation, we include the following:

- 1) At the country level (macro level):
 - implementation of measures to overcome corruption[16];
 - the revival of morality and the general culture of society;
 - creation of favorable innovative climate and innovative culture of the country's population;
 - maintenance of domestic commodity producers;
 - development and implementation of effective intellectual property rights protection instruments at the legislative level.
- 2) At the level of regions and types of economic activity (meso-level):
 - development of higher and special professional education in the branch directions;
 - development of innovative infrastructure;
 - distribution of clusters for business development;
 - maintenance of domestic commodity producers.
- 3) At the enterprise level (micro level):
 - scientific approach to the organization of work;
 - modern high-quality and efficient management system and appropriate organizational structure and system of motivation and stimulation of labor;
 - introduction of innovative approaches, methods, tools in all areas of activity.

It should be noted that human capital is transformed into an innovative one in the context of continuous improvement of knowledge and skills in the process of labor, the cumulative number of which, under appropriate conditions, becomes a higher quality, which ensures the development of human capital on an innovative basis.

5. Discussion

The main scientific novelty of the research is the substantiation of the preconditions for human capital development at different hierarchical levels of the economic system (at the level of the country, at the level of the region or a separate type of economic activity and at the level of the individual economic entity – the enterprise). Unlike the classical historical, economic, political, social and other prerequisites for human capital development identified in modern science [9, 17],

their distribution on the hierarchical levels of the economic system will allow in the future to study in detail the trends and substantiate the systemic measures of human capital development in the conditions of knowledge economy formation.

The scientific result also refers to the identification of the human capital development stages, which makes it possible to systematically approach its formation and implementation and bring it up to a higher innovative level. This made it possible to identify internal factors in human development of human capital. At the same time, this study does not propose ways to influence internal factors from the outside, which would justify measures aimed at developing and improving the efficiency of human capital use.

The problems of human capital development in Ukraine also discovered in this study need to be studied in more detail in order to solve them. For example, the creation of a comprehensive program for human capital development at all levels of the economic system by integrating and cooperating with state, regional, educational, scientific institutions, business, etc., is essential for preserving the existing human capital, which is a matter of national security in today's crisis conditions.

6. Conclusions

1. Getting education and basic knowledge, their accumulation in the process of work, consolidating knowledge and skills, gaining experience as well as the continuous improvement are the stages human capital development, which leads to a new higher quality of knowledge and skills, creativity, new possibilities of applying knowledge, higher innovative thinking, innovative human capital. Successful implementation of human capital development stages is possible due to the systematic process of continuous self-education, self-organization, self-regulation and self-improvement of people throughout life. On the side of the state, local authorities and business it is important to create conditions for the human capital development.

2. Ukraine has a rather high level of human capital development (24th in the world from 130 countries and 70 % of use), mainly due to investments in its own first higher education (80 % of the population)). At the same time, major problems are the reduction of employment opportunities in the specialty due to the low qualification and inconsistency of the obtained education with the demanded occupations in the labor market, which are changing on a global scale, as well as the mass emigration of qualified specialists to other countries in the conditions of economic and political crisis.

3. As the knowledge economy is closely linked to innovation and entrepreneurial initiative, the creation of the above-mentioned preconditions at all hierarchical levels of the economic system and the directions of human capital found in further research will form the basis for the development of an organizational and economic mechanism for human capital development on an innovative basis to increase the efficiency of entrepreneurial activity and, as a result, improving the well-being and quality of people's life.

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ECONOMIC EFFICIENCY OF USING SOLAR ENERGY IN THE AGROINDUSTRIAL BUSINESS

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Abstract

Under conditions of limited organic resources, polluted external environment, excessive emission of carbon in the atmosphere and as a result of global warming the use of renewed energy sources may become one of ways of solving problems of energy saving, energy efficiency, environment protection, energy independence from import raw materials. The active use of renewed energy sources will favor the increase of economic efficiency and competitiveness of components of the national AIC.

The article indicates that during the last 20 years the world underwent worsening of natural-climatic and living conditions, climate change, strengthening of negative natural phenomena and so on. The aforesaid problems of the world scale were discussed at the international climatic conferences (Brazil – 1992; Japan – 1997; SAR – 2002; Paris – 2015; Germany – 2017), while considering the complex of questions as to improving the natural-climatic and living environment in the world, saving use of natural resources, acceleration of using renewable energy sources (RES), especially solar one.

It was elucidated, that during the last years the power of solar energy stations (SPS) grew essentially. For the end of 2015 the leaders in setting SPS were the following countries: China, Germany, Japan, USA. In Ukraine the plan of development of the Combined energetic system for 2016–2025 years of SE «NEC «Ukrenergo»» provided the association of SPS power with electric nets of energy system with volume 1641.2 MW.

There was realized the grouping of Ukrainian regions by the level of the technically achievable potential of solar energy.

There was realized the assessment of the economic efficiency of products at using solar energy in the agroindustrial business in different regional conditions of Ukraine.

Keywords: solar energy, efficiency of projects, cash receipts, cash expenses, payback period, return on investments.

1. Introduction

The world community considers the use of renewable energy sources (RES) as one of most prospective ways of solving increasing problems of energy saving. The presence of inexhaustible resource base and ecological pureness of RES are determining advantages under conditions of using non-renewable resources of organic fuel and increasing terms of pollution of the natural environment. At the same time the growth of the population number in the world, reduction of world reserves of many dug out types of fuel, increase of prices for petroleum and gas, striving to decrease the energy dependence on import raw materials condition the increase of countries' motivation as to the development and use of renewable energy sources.

Questions of the development of solar energy in the world practice were considered in many scientific works of researchers throughout the world [1, 2]. Problems of expedience of using renewable energy sources are considered in scientific sources [3, 4], and their dynamics – in literature [5, 6]. Modern aspects of using solar energy in Ukraine are elucidated in literature [7, 8]. Prospects of using renewable energy sources in Ukraine – in literature [9, 10]. But problems of using renewable sources of energy remain urgent and need a scientific solution of a series of concrete questions, especially determination of the economic efficiency of projects for using solar energy in the agroindustrial business under concrete production conditions, taking into account regional peculiarities of solar insolation in Ukraine.

2. Aim of research

To determine the economic efficiency of products for using solar energy in the agroindustrial business under different conditions of solar insolation in Ukraine.

3. Materials and methods of research

At preparing the scientific article, there were used the data of statistic yearbooks, reports, projects of SE “NEC”Ukrenergo”, Scientific-project center of the development of the combined energetic system of Ukraine, National institute of strategic studies, State energy efficiency.

The following methods were used in the work: monographic, economic-statistic (statistic observation, grouping, comparison), method of analysis and synthesis, calculating-constructive, financial planning and prognostication, abstract-logic.

4. Research results

The worsening of conditions of the natural-climatic environment, living conditions in many world countries, climate change, caused by acceleration of the world economy globalization, condition the urgent problem – activation of using RES.

Problems of worsening the natural-climatic conditions, living environment, change of climate with negative consequences in the world was discussed at the international climatic conferences [1, 2]: in Brazil («Rio - 92», 1992); «Rio + 5» (New-York, 1997); (signing of «Kioto protocol») in Japan, 1997; «Rio + 10» (Johannesburg, 2002); (COP 21 «Parisian agreement» in France, 2015); in FRG (Bonn, 2017).

At the climatic conference in Bonn the main cause of the global warming was named – the increase of emissions of carbon dioxide in the atmosphere, resulted in worsening climatic conditions, natural cataclysms with great negative and destructive results in the world. There was considered the complex of questions as to improving the natural-climatic and world environment in the world, rational use of natural resources, activation of using RES and so on.

Practice testifies that the method of direct transformation of solar radiation in electric energy is most comfortable for a consumer. Such method is considered as eco-friendly way of getting electric energy as opposite to other ones (thermo-, hydro-, nuclear electric stations) [3, 4].

The report of the international conference REN 21 («GLOBAL STATUS REPORT 2016») [5, 6] about the state of world alternative energetics indicates that during the last years the power of solar power stations (SPS) grew essentially. Thus, in 2000 the world power of solar energy stations was only 1.29 GW, in 2005 – 5.1 GW; in 2008 – 15.84 GW ; in 2009 – 23.18 GW. The abrupt growth of solar energy stations in the world was observed since 2010, where set power of solar stations

reached 40.33 GW, in 2011 – grew to 70.47 GW, in 2012 – to 100.5 GW, in 2013 – to 138.86 GW, in 2014 – to 178.99 GW, in 2015 – to 237.12 GW.

As it is testified by literature [7] for the end of 2015 the leaders of set power of solar photoelectric systems (stations) were the following countries: China (43 GW), Germany (39.6 GW), Japan (33.3 GW), USA (25.5 GW) and Italy (18.9 GW). In 2015 China became the absolute leader in the development of renewable solar energetics. There were set 14.8 GW of photoelectric systems (stations). China with the total power of solar energetic more than 43 GW occupies the leading place in the world. Such progress is stimulated by the necessity to decrease pollution of the external environment as a result of burning dug out fuel under conditions of growing needs in energy.

Japan occupies the second place in the rating for 2015, according to the report of REN 21. In 2015 near 10 GW of power were set there. USA is at the third place with 7.3 GW of set power of SPS, at that the total set power of all types of SPS in the country is near 25.5 GW than 15 times exceeds the level of 2005. The list of 10 most acting or built photoelectric SPS includes 4 American ones with the power from 290 MW to 580 MW.

EU countries in 2015 set near 7.2 GW, and the total set power of SPS for the end of 2015 reached 98.66 GW, or increased since 2005 more than 30 times.

It must be noted that the positive dynamics of growing solar energetics will be kept further. The essential activation of the development of solar energetic was favored by signing the agreement by most countries at the climatic conference COP21 in Paris about counteraction to climatic changes by intensifying the development of renewable energetic for decreasing emission volumes of greenhouse gases. The Parisian conference accepted (2015) the international act about reduction of emissions and keeping global warming at the level less than 2 °C of the pre-industrial level. For industrially developed countries volumes of decreasing emissions must be 80–95 % of 1990 to 2050, and for developing countries – to 50 % of the level of 1990.

It must be noted that the use of the solar energy potential in Ukraine is conditioned by climatic peculiarities of its territory. Thus, the average annual potential of solar energy in Ukraine (1235 kW hour/m²) is rather high and much higher than in Germany – 1000 kW hour/m², or Poland – 1080 kW hour/m² [8]. These indices indicate that Ukraine has good possibilities for the effective use of the thermoenergetic equipment at its territory.

The development of solar energetic in Ukraine is related to priority national projects, the first solar power station was put into operation in 2010. In 2011 the set power of power stations on RES in Ukraine grew from 152 Mw to 397 MW. In 2012 the power of built solar power stations in Ukraine increased to 230 MW.

At the beginning of 2016 112 objects of solar energetics with the set power almost 838.83 MW functioned in Ukraine by the “green” tariff for electric energy production. These objects produced more than 475.1 mln kW·hour of electric energy in 2015.

The decree of the President of Ukraine of 12.01.2015 No.5/2015 approved the development strategy «Ukraine – 2020». The main aims of the state policy in the sphere of energetic independence is, according to statements of the Strategy, the reduction of energy consumption of GDP by 20 % till 2020 by beginning to use energy effective technologies and equipment, realization of projects using alternative energy sources, provision of 100 % of the obligatory commercial accounting of energy resources consumption (energy, fuel) and so on.

It must be noted, that activation of RES development at the state level motivated the Institute of renewable energetic of NAS of Ukraine to create the Atlas of the energetic potential of renewable energy sources of Ukraine that presented the annual technically achievable potential of renewed energetics of the country. The order of NCRECS of 30.06.2016 No.1187 about fixing “green” tariffs for electric energy for economic subjects and bonuses to green tariffs for observing the level of using the equipment of Ukrainian production (with changes) fixed the following “green” tariffs for electric energy producers (cop/kW·hour, without VAT): wind energy – 317.93; biomass and biogas – 348.21; micro-, mini- and small HPS – from 327.02 to 545.03; from energy of solar radiation: land objects – from 449.65 to 1308.06; SPS which set power exceeds 10 MW – 726.70; SPS, fixed on roofs and/or facades of houses, buildings and facilities, which set power exceeds 100 kW – from

981.05 to 1253.56; SPS, CEC, fixed on roofs and/or facades of houses, buildings and facilities, which set power doesn't exceed 100 kW – from 906.86 to 1199.06 and so on [9].

The further development of RES is realized by VR of Ukraine that adopted the Law of Ukraine of 04.06.2015 No. 514-VIII «About introduction of changes to some laws of Ukraine as to providing competitive conditions of production of electric energy of alternative energy sources». It must be noted that SE «NEC «Urenego» elaborated the Plan of development of the Combined Energetic System (CES) of Ukraine for 2016–2025 years (farther – Plan of development of CES of Ukraine for 2016–2025), which statements determined the main directions of the development of alternative energetics (WPS, SPS, BPS) till 2025 as electric energy sources.

For accelerating realization of projects on renewable energy sources, there is the program of financing alternative energetic in Ukraine (USELF), supported by the European Bank for reconstruction and development (EBRD) and Fund of clean technologies of the World bank.

According to the National plan of actions on renewable energetics for the period till 2020, the set power of SPS in 2020 must reach 2300 MW, raising production of electric energy to 2420 GW·hour [9].

For realizing the National plan of actions on renewable energetic for the period till 2020 The State energy efficiency together with the Institute of renewable energetic of NAS of Ukraine elaborated the project of a Road map of the development of solar energetics in Ukraine till 2020 and posted it on the site of State energy efficiency for discussing. The main aim of elaboration and realization of the Road map is favoring investments in the development of the sphere of renewable energetic of the country. For raising the efficiency of using energy resources in Ukraine, the National institute of strategic studies elaborated the “Project of energetic strategy of Ukraine till 2035” for the Ministry of energetics and coal industry [10].

It must be indicated, that essential reserves of raw materials, industrial and scientific-technical base for producing photoelectric devices for SPS can not only completely satisfy needs of domestic consumers, but to create conditions for beginning export supplies of more than two thirds of products.

The potential of solar energy and calculation of theoretically possible and technically available solar energy in regions of Ukraine is elucidated in the Road map of the development of renewable energetics of Ukraine till 2020.

Based on this Road map, we divided territories of the regions of Ukraine in four groups by the level of the technically achievable potential of solar energy in the regions of Ukraine (**Table 1**).

As it is seen on the table, the highest level of the technically achievable potential of solar energy is inherent to the regions of IV group (AR Crimea, Odessa region), and the least one – Western regions of Ukraine (I group of regions).

Let's note, that such division of regions by the level of the technically achievable potential of solar energy, is very important as to the effective placing, functioning and using solar power stations.

Table 1

Level of the technically achievable potential of solar energy at the territory of Ukraine

Groups of regions by the level of technically achievable potential, Bil kW·hour/year			
I – >1.00	II – 1.01–1.50	III – 1.51–2.00	IV – 2.01 and more
Rivne (0.96)	Poltava (1.5)	Kherson (1.84)	AR Crimea (2.2)
Ternopil (0.81)	Kiev (1.45)	Dnipropetrovsk (1.76)	Odessa (2.09)
Ivano-Frankivsk (0.70)	Cherkasy (1.4)	Zaporizhzhya (1.66)	
Transcarpathian (0.62)	Vinnitsia (1.29)	Kharkiv (1.62)	
Chernivtsy (0.46)	Kirovograd (1.26)	Chernihiv (1.6)	
	Sumy (1.21)	Lugansk (1.56)	
	Lviv (1.12)	Donetsk (1.54)	
	Khmelnitsky (1.08)	Zhytomyr (1.52)	
	Volyn (1.04)	Mykolaiv (1.52)	

Source: made by the author, based on [7]

Detail studies of the problem of production and use of solar energy by existent projects were realized on the example of agroindustrial enterprise InSC “Dobra Voda” of Zboriv district of Ternopil region. This enterprise extracts, processes and realizes drinking water for consumers.

For saving energy, decreasing production and administrative expenditures and possibly getting additional profits for energy, sold by the “green” tariff, several projects as to setting up a solar power station on roofs of own lodgings and also at the territory of the enterprise were offered for InSC “Dobra Voda”. The general technological scheme of a solar power station is presented in literature [11]. The review of the market of solar panels is elucidated on sites [12, 13]. Commercial offers on problems of realization of projects for setting solar power stations are considered in literature [14–17].

The studies of the economic efficiency of using solar energy under conditions of InSC “Dobra Voda” were realized by the realistic production scenario (5285.1 thousand bottles of water in a year) by existent projects with power: 585 kW; 700 kW; 850 kW; 1 MW.

It was established, that the most amount of electric energy by all analyzed projects will be produced during the spring-summer period (April – August). The least amount of electric energy will be produced by all projects in the following months: January, February, October, November, December. Just for this period the enterprise must buy the necessary amount of energy from energy sources.

At the realistic production scenario at the analyzed enterprise, energy consumption in a year were 712.7 thousand kW-hour, and average month consumption of electric energy – 59.4 thousand kW-hour. It conditions the need in buying electric energy in Autumn-winter months: 206.4 thousand kW-hour for the project of 585 kW; 169.5 thousand kW-hour – project of 700 kW; 142.2 thousand kW-hour – project of 850 kW and 119.1 thousand kW-hour – project 1MW. At the same time the excess of electric energy in spring-summer periods will be: 53.2 thousand kW-hour for the project of 585 kW; 126.3 thousand kW-hour – project of 700 kW; 242.5 thousand kW-hour – project of 850 kW; 362.8 thousand kW-hour – project of 1MW.

The studies demonstrated that the use of projects with the higher power favors the increase of solar energy for possible sale by the “green” tariff.

The expected results of the economic efficiency of using solar energy by projects at the realistic production scenario (5285.1 thousand bottles of drinking water) at actual tariffs till 2020 are presented in **Table 2**.

As it can be seen from the table, the most effective project of InSC “Dobra Voda” is the project with power 1 MW. It allows the enterprise to get net receipts (cash flow) in a year as 2820.23 thousand hrn. The payback period is 11.4 years, and return on investments – 8,78 %.

The second place by the analyzed efficiency parameters belongs to the project of 850 kW. Its net receipts are 2213,09 thousand hrn in a year, payback period – 12,5 years, return on investments – 8 %.

Let’s note, that the calculation of static indices of the investment efficiency (return on investments and payback period), was realized by actual tariffs till 2020. For specifying the calculations of net receipts (cash flow) from realization of the project and also static indices of the investment efficiency, the projects must be analyzed in dynamics. For the complex assessment of their efficiency, taking into account cost of moneys in time, it is necessary to calculate discount indices of the investment efficiency (there are present value of net receipts (cash flow) , net present value of project, profitability index of the investment project, discount payback period, internal rate of return).

It must be said, that the operation term of projects on setting solar power stations is 25years. That is why at assessing the efficiency of innovative projects using discount methods, there were taken into account cash receipts and cash expenses for projects till 2042. Let’s note that from 2018 to 2019 the sale of electric energy by “green” tariff is set at the level of 16.37 eurocents/kW hour for power stations on roofs; for the period 2020–2024 tariffs will decrease to 14.76 eurocents/kW hour for power stations on roofs and 13.52 eurocents/kW hour for surface power stations. During 2025–2029 tariffs will decrease again to 13.09 eurocents/kW hour for power stations on roofs and 12.01 eurocents/kW hour for surface power stations. The state has not legally determined a pay-

ment for energy of RES Starting from 2030. That is why calculations for the period 2030–2042 are based on the tariff of buying energy from electric nets, namely 153,92 cop without VAT for 1 kW.

Table 2

Economic efficiency of projects on using solar energy at the enterprise InSC “Dobra voda” by the realistic scenario at actual tariffs till 2020

Parameters	Use of projects by power:			
	585 kW	700 kW	850 kW	1 MW
Need of electric energy in a year, kW-hour	712744.0	712744.0	712744.0	712744.0
Expenditures for used energy in a year, thousand hrn	1316.47	1316.47	1316.47	1316.47
Produced electric energy in a year, kW-hour	559552.5	669550.0	813025.0	956500.0
Energy, must be bought for autumn-winter months in a year, kW-hour	206438.7	169494.3	142176.7	119071.0
Expenditures for bought electric energy in a year, thousand hrn	381.30	313.06	262.61	219.93
Possible realization of the excess of electric energy in a year (by the “green” tariff), kW-hour	53247.3	126300.4	242457.7	362827.0
Cash receipts for sold energy by the “green” tariff in a year (for power stations on roofs)*, thousand hrn	271.96	271.96	271.96	271.96
Cash receipts for sold energy by the “green” tariff in a year (for power stations on land surface)*, thousand hrn	–	342.57	887.28	1451.73
Cash receipts from the project for electric energy, consumed by an enterprise, thousand hrn	1316.47	1316.47	1316.47	1316.47
Cash receipts from realization of the project totally in a year, thousand hrn	1588.42	1931.00	2475.70	3040.16
Money expenditures for buying electric energy in a year by the project, thousand hrn	381.30	313.06	262.61	219.93
Net receipts (cash flow) for the project in a year, thousand hrn	1207.12	1617.93	2213.09	2820.23
Cost of the project, thousand hrn	19693.81	22674.12	27665.14	32109.84
Payback period of the project, years	16.31	14.01	12.50	11.39
Return on investments, %	6.13	7.14	8.00	8.78

Note: exchange rate of euro for 1.10.2017 was 31.2 hrn. Source: author's calculations based on [15, 16, 18]

The economic efficiency of innovative projects of using solar energy taking into account the conception of discounting by the realistic scenario of agroindustrial production under conditions of InSC “Dobra voda” is presented in **Table 3**.

Table 3

Economic efficiency of innovative projects of using solar energy taking into account the conception of discounting by the realistic scenario of agroindustrial production under conditions of InSC “Dobra voda”

Parameters	Projects by power:			
	585 kW	700 kW	850 kW	1 MW
Production volume by the realistic scenario, thousand bottles of water	5285.1	5285.1	5285.1	5285.1
Net receipts (cash flow) for the project totally, thousand hrn	27514.99	34569.67	44335.79	54215.80
Cost of the project thousand hrn	19693.81	22674.12	27665.14	32109.84
Effect (benefit) from realization of the project, thousand hrn	7821.18	11895.55	16670.65	22105.96
Average annual return on investments, %	5.59	6.10	6.41	6.75
Payback period, years	17.89	16.40	15.59	14.80
Discount rate, %	4.50	4.50	4.50	4.50
Present value of net receipts (cash flow) thousand hrn	16624.94	21170.56	27537.59	33993.01
Net present value of the project, thousand hrn	–3068.88	–1503.56	–127.54	1883.17
Discount payback period, years	29.61	26.78	25.12	23.62
Profitability index	0.84	0.93	0.99	1.06
Internal rate of return, %	2.80	3.80	4.40	5.10

Source: author's calculations, based on [15, 16, 18]

The study of the economic efficiency of investment projects in the dynamics for 25 years, taking into account the conception of discounting, demonstrated that among four offered projects, the most effective is the one with power 1 MW. The efficiency indices for this project are: effect (benefit) from its realization – 22105.96 thousand hrn; average annual return on investments – 6.75 %; payback period – 14.8 years, net present value at discount rate 4.5 % is 1883.17 thousand hrn, discount payback period – 23.62 years; profitability index – 1.06, and internal rate of return that indicates the maximal permissible discount rate value is 5.1 %.

It is necessary to take into account, that the economic profit from realization of the projects with less power is: for the project of 850 kW only at discount rate 4.4 %; for the project of 700 kW – at discount rate 3.8 %; for project of 585 kW – only at discount rate from 2.8 %.

Let's note, that under conditions of Ternopil region and also Rivne, Ivano-Frankivsk, Transcarpathian, Chernivtsy projects of setting solar power stations are less effective than in other regions of Ukraine, that is conditioned by the technically achievable potential of solar energy (**Table 1**).

The analyzed projects of using solar energy under conditions of Eastern and Southern regions of Ukraine may have much more successful indices of the economic efficiency. This fact motivated us to determine the economic efficiency of the analyzed projects on using solar energy taking into account the level of the technically achievable potential of solar energy in all groups of regions of Ukraine. For that, based on table 1, where was determined the average technically achievable potential of solar energy in each group of regions. Taking into account that the studied enterprise InSC "Dobra voda" is almost on the boundary of Lviv and Ternopil regions, the calculated average level of the technically achievable potential is 0.956.

Taking into account text limitations for elucidating results of the studies of the economic efficiency of all projects on using solar energy under different regional conditions of Ukraine, we considered detail the efficiency results of only two projects – power 700 kW (**Table 4**) and 1 MW (**Table 5**).

As we can see on **Table 4**, electric energy production by the project with power 700 kW will increase from 669550 kW hour/year (first group) to 1407000 kW hour/year (fourth group) or in 2.1 times. The need in buying electric energy in autumn-winter months will change essentially: from 169494.3 kW hour/year in the first group to 68158.59 kW hour/year in the fourth group. Expenditures for buying electric energy for year will decrease too. At that the sale of excesses of electric energy by the "green" tariff will essentially grow from 126300.4 kW hour/year in the first group to 762414.63 kW hour/year in the fourth one. These factors provide the increase of net receipts (cash flows) of the analyzed project: 34569.67 thousand hrn in the first group to 88058.84 thousand hrn in the fourth one or in 2.5 times and effect (benefit) correspondingly from 11895.55 thousand hrn to 65384.72 thousand hrn or in 5.5 times. Efficiency indices of the project essentially were improved by groups of solar insolation: average annual return on investments will grow from 6.1 % (first group) to 15.53 % (fourth group), or in 2.5 times; payback period will decrease correspondingly – from 26.78 to 10.04 years or in 2.6 times. It must be noted that the net present value of the project will increase from (–1503.56 thousand hrn) in the first group to 33761.05 thousand hrn in the fourth one. At that the investment profitability index that indicates the current cost of incomes in the calculation for each hryvnia of pure investments, will increase from 0.93 (first group) to 2.49 (fourth group).

The internal rate of return that indicates the maximal permissible value of the discount rate or capital cost will grow from 3.8 % (first group) to 19.3 % (fourth), or in five times. It testifies that enterprises of the first group of solar insolation can involve assets only for 3.8 % per annum, second group – 8.7 %, third group – 12.1 %, and the fourth group – 19.3 %.

The studies demonstrated that the comparatively highest economic efficiency of using solar energy by analogous parameters in all regional conditions with different levels of solar insolation is provided by the project with power 1 MW (**Table 5**). As we can see from the table, main economic indices are essentially improved: net present value of the project may increase from 1883.2 thousand hrn (first insolation group) to 52504.6 thousand hrn (fourth group); the discount payback period may be decreased, correspondingly from 23.62 to 9.49 years; investment profitability index may be increased from 1.06 to 2.64, the internal rate of return may be raised from 5.1 % (first group) to 21.1 % (fourth insolation group).

Table 4

Economic efficiency of the innovative project of using solar energy with power 700 kW, taking into account the discounting conception, by the realistic production scenario at enterprises of the agroindustrial business under regional conditions of different levels of solar insolation in Ukraine

Parameters	Groups of regions by the average level of the technically achievable potential of solar energy, bil kW ·hour/year			
	I gr. (0.956)	II gr. (1.290)	III gr. (1.520)	IV gr. (2.01)
Electric energy production in a year, kW·hour	669550.0	903000	1064000	1407000
Electric energy, must be bought in autumn-winter months for year, kW·hour	169494.3	125699.62	105751.72	68158.59
Sale of excesses of electric energy for year (by the “green” tariff), kW·hour	126300.4	315955.66	457007.76	762414.63
Net receipts (cash flow) for the project totally, thousand hrn	34569.67	51110.37	62844.24	88058.84
Cost of the project, thousand hrn	22674.12	22674.12	22674.12	22674.12
Effect (benefit) from realization of the project, thousand hrn	11895.55	28436.26	40170.12	65384.72
Average annual return on investments, %	6.10	9.02	11.09	15.53
Payback period, years	16.40	11.09	9.02	6.44
Discount rate, %	4.50	4.50	4.50	4.50
Present value of net receipts (cash flow), thousand hrn	21170.56	32030.38	39772.90	56435.16
Net present value of the project, thousand hrn	−1503.56	9356.26	17098.79	33761.05
Discount payback period, years	26.78	17.7	14.25	10.04
Investment profitability index	0.93	1.41	1.75	2.49
Internal rate of return (IRR), %	3.80	8.7	12.1	19.3

Source: author's calculations, based on [7, 15, 16, 18]

It was established, that the lowest level of economic efficiency of using solar energy in all regions of Ukraine is provided by the project with power 585kW that can be used at small and middle enterprises of the agroindustrial business.

The project with power 850 kW occupied the second place after the project of 1 MW by the economic efficiency of using solar energy. It is expedient to use it at enterprises of agroindustrial business with different sizes.

The presented results of the economic efficiency of innovative projects with using solar energy demonstrate that central and regional authorities must differentially support and motivate consumers of solar energy by: giving concessional loans with the minimal lending rate (2.0–3.0 %) especially for enterprises of the agroindustrial business and also smoothing conditions and taxation requirements for all enterprises of the agroindustrial business for the period of developing projects of renewable energy sources. .

6. Conclusions

1. Thus, most countries of the world support activation of the development of solar energy, stimulate its wide use, increase of efficiency and economic profit, aim at 50 % and more use of RES in the energetic sector. Each country elaborated its own way of achieving this aim that takes into account implementation term, volumes and target directions as to increasing the level of energetic safety, preventing global climatic changes and widely implementing energy effective directions of using energetic resources, especially with RES.

Table 5

Economic efficiency of the innovative project of using solar energy with power 1 MW, taking into account the discounting conception, by the realistic production scenario at enterprises of the agroindustrial business under regional conditions of different levels of solar insolation in Ukraine

Parameters	Groups of regions by the average level of the technically achievable potential of solar energy, bil kW·hour/year			
	I gr. (0.956)	II gr. (1.290)	III gr. (1.520)	IV gr. (2.01)
Electric energy production in a year, kW·hour	956500.0	1290000	1520000	2010000
Electric energy, must be bought in autumn-winter months for year, kW·hour	119071.0	77750.32	59321.99	21003.99
Sale of excesses of electric energy for year (by the “green” tariff), kW·hour	362827.0	655006.36	866578.03	1318260.03
Net receipts (cash flow) for the project totally, thousand hrn	54215.80	78148.77	94975.70	130933.61
Cost of the project, thousand hrn	32109.84	32109.84	32109.84	32109.84
Effect (benefit) from realization of the project, thousand hrn	22105.96	46038.93	62865.86	98823.77
Average annual return on investments, %	6.75	9.73	11.83	16.31
Payback period, years	14.80	10.27	8.45	6.13
Discount rate, %	4.50	4.50	4.50	4.50
Present value of net receipts (cash flow), thousand hrn	33993.01	49744.44	60856.57	84614.42
Net present value of the project, thousand hrn	1883.17	17634.60	28746.73	52504.58
Discount payback period, years	23.62	16.14	13.19	9.49
Investment profitability index	1.06	1.55	1.895	2.64
Internal rate of return (IRR), %	5.10	10.2	13.7	21.1

Source: author's calculations based on [7, 15, 16, 18]

2. According to the National plan of actions on renewable energetics for the period till 2020, the set power of SPS in Ukraine must reach 2300 MW with increasing electric power production to 2420 GW·hour.

3. Activation of using RES in the agroindustrial business allows to accelerate the efficiency of enterprises' functioning, to raise the competitiveness of domestic products at internal and external markets.

The studies demonstrated that among four offered projects of using solar energy the most effective for all four groups of regions with different levels of solar insolation is one of 1 MW taking into account the discounting conception: discount payback period – 23.62 (I group of regions) – 9.49 years (IV group of regions); profitability index is correspondingly – 1.06–2.64, internal rate of return that indicates the maximal permissible discount rate value is 5.1–21.1 %.

The offered projects of using solar energy reach the comparatively highest efficiency of functioning in regions of the fourth and third groups with the highest level of technically achievable potential of solar energy that testifies the expedience of building solar power stations in the aforesaid regions, in first turn.

4. At the macroeconomic level state authorities must realize the differentiated approach (by coefficients, set in regions) as to the state assistance and support of building and development of solar power stations by: giving concessional loans with the minimal lending rate (2.0–3.0 %), smoothing conditions and taxation requirements for all enterprises of the agroindustrial business for the period of developing projects and so on.

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INNOVATIVE ENVIRONMENT IN UKRAINE: FORMATION AND EVALUATION OF DEVELOPMENT IN THE CONDITIONS OF THE BALANCED ECONOMIC GROWTH

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Abstract

The paper notes that the success of economic policy aimed at forming a new model of Ukraine's economic growth is facilitated by a clear choice of priorities, among which the main thing is to ensure high rates of sustainable economic growth.

The main components of the innovative environment of the economy are determined. The analysis of indicators of innovative development of the countries of the world for the period 2011–2017 is carried out using the Principal Components and Classification Analysis method in the Statistica 10.0 software package. The factors of influence on the innovative development of countries are determined. The advantages of structuring the innovative environment are determination of the subordination of priorities for supporting innovations by the state, business and financial market.

In the course of the research, methods of systemic, theoretical generalization, analysis, comparative comparison, tabular and graphical presentation of results are used, which allows the author to prove a low level of regulation of the innovation process characteristic of the Ukrainian economy. The problems of innovative development of groups of countries with low and above average level of income according to the World Bank classification are characterized by the lack of a developed innovative environment, the implementation of the secondary role of the state as a component of the national innovative system.

The peculiarity of state regulation of high-income countries is determined by the balance of innovation policy instruments. The presence of a developed institutional environment (fundamental conditions) ensures the effectiveness of financial support of the business, obtaining high results from innovations and retaining the leading position on innovative development.

At the decision of the enterprises of a group of countries with a level of incomes above the average for the implementation of investments in innovative activities and further innovative development, financial markets, commodity markets and the effectiveness of the legal system are of greatest importance. It is proved that for the low-income countries the variable "Market development" has a stimulating significance for economic growth.

The above, as well as fragmentation, the definition of factors of innovative development according to the Global Innovation Index, provided grounds for the author to give recommendations (integral indicator) in determining the priority of development of the content elements of the national innovative system, highlighting the importance of the state, human capital, research, financial and commodity markets in economic growth of the country, identifying sources and priorities for financing innovative development.

Keywords: state, economy, development, environment, innovation, policy, evaluation.

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1. Introduction

In a difficult economic situation, ensuring long-term sustainable economic development for Ukraine is a top priority. Restoration of socio-economic growth after the stagnation and recession of 2013–2017 due to the exhaustion of the potential of the export-raw material development model, the poor quality of the institutional environment, underinvestment of R&D and investment in production, the rapid aging of the material and technical base of the economy, the crisis in the scientific sphere leading schools and scientific and technical complexes in the sphere of fundamental sciences, the outflow of scientific personnel abroad), the orientation toward the strategy of import substitution, the instability of the banking system themes and more challenging than for Ukraine to overcome the 2009 crisis. Ukraine is viewed as a country in the second, investment stage of development, according to which competitiveness is achieved through increased labor productivity, the ability to attract technology and capital, improving product quality and optimizing costs. This means that the efficiency and elasticity of the market, the commodity market, the labor market, the country's ability to attract investments and invest in human capital are important for increasing the competitiveness of the economy.

To ensure sustainable economic development, the conceptual rethinking of state economic policy, in particular innovation policy, is topical. Unbalanced innovative policy of the state has a negative impact on setting the goals of the national innovative system, the efficiency of the allocation of financial resources, the interaction of elements of the innovative environment, slows down innovative development and leads to the loss of competitiveness of the economy.

Despite the fact that the economic growth and development of the innovative environment is the subject of scientific research of many scientists, the analysis of recent publications convincingly shows that the issues of ensuring the interaction of public authorities, the formation of a national innovative system, determining the impact of innovation on economic growth and labor productivity remain important.

So, according to the author [1], “In the era of globalization of the economy, the informatization of society and the formation of innovative models of socio-economic development of national economies, the innovative environment becomes a key source of innovation that provides:

- accelerating and increasing the efficiency of the processes of creating innovations from the idea to the beginning of production, in particular, due to the ability of the innovative environment to generate synergy at interfunctional and multi-institutional levels;
- increase in value added in the production of innovative products or with the use of innovations in the production process;
- increase in speed and expansion of the boundaries of diffusion of innovations in the distribution process.

In these conditions, when forming an innovative environment, it is necessary to ensure its organic inclusion in all phases of the reproduction cycle: “production-distribution-exchange-consumption”.

According to the author’s opinion [2] “the active role of the state lies in: orientation to innovation on its own basis, organization and finance of the fundamental science, risk applied research; import substitution using own developments; refusal from broad support of traditional export industries, improvement of institutional conditions due to the reduction of regulatory functions of the state and stimulation of business “.

The author [3] notes that “at the macroeconomic level, the growth of labor productivity determines the dynamics of GDP, provides an increase in the purchasing power of the bulk of the population, becomes an effective means of weakening inflation and the main source of activities aimed at social development and the growth of living standards.”

According to the opinion of author [4], “The central aim of most research on Innovation Systems has been to reveal how differences in configurations as well as interactive learning processes of the respective actors and institutions are responsible for particular (knowledge-based) economic outcomes. Much of Innovation Systems research has focused on analyzing how generic innovation capabilities can be strengthened. The first central question “what” to transform or sustain concerns the overarching issue of directionality or goal-orientation of Innovation Systems. Directionality primarily involves the question “What is the ultimate goal of an Innovation System?” In the context of sustainability, it is also a question of “the right” transformation pathway(s) for social, economic, ecological, cultural, technological, and other relevant (sub-) systems. Therefore, directionality is not only about challenging the contemporary implicit focus on technological innovation and economic growth but also about opening up the Innovation System approach for a variety of pathways and actors while closing down other, non-sustainable options”.

According to the opinion of author [5], “The innovation environment comprehends institutions which, together and individually, contribute to the development and dissemination of new information and new technologies and which comprise a structural and legal framework, on which the government executes policies promoting innovation. The innovation environment consists of structures, actors, reciprocalities and a legally created operating environment. In addition to these, other key elements include an innovation culture, processes that inspire individuals and organizations to create the new, global information channels as well as shared innovation knowledge and interpretative frames of reference”.

According to [6], “conditions for investment have generally improved, amid low financial volatility, reduced banking sector fragilities, recovery in some commodity sectors and a more solid global macroeconomic outlook. Financing costs generally remain low, and spreads have narrowed in many emerging markets, reflecting a decline in risk premia. This has supported rising capital flows to emerging markets, including a rise in cross-border lending, and stronger credit growth in both developed and developing economies”.

It is reported that “science, technology and innovation have long been important drivers of economic growth and human development. Growth relies on the integration of basic and applied research, at both public and private levels, on an international scale. The challenge is to ensure that, even during phases of economic slowdown, science and technology continue to support the objectives of sustainability and improved living standards in all countries. Institutional arrangements are needed to make sure that the potential of science and technology is aligned with the paths and strategies of economic development, social inclusion and environmental sustainability, are argued by the United Nations report, “Transforming our world: the 2030 Agenda for Sustainable Development” [7].

As the author [8] notes, “although monetary and fiscal policy is implemented by two different state bodies, they are not independent. Changes in one of the bodies will affect the effectiveness of the work of the other and, thus, will have a general effect on changes in any policy. Tensions can arise between how each of the policies will help smooth the economic cycles, achieve macroeconomic stability and growth”.

The inability of central banks to raise inflation expectations at zero bottom threshold, the lack of coordination between monetary authorities and fiscal authorities ... interact inappropriately to achieve the desired level of inflation [9].

2. The aim of research

The aim of research is development of recommendations for determining the priorities of the state innovative policy and assessing the innovative environment in the context of balanced economic growth in Ukraine. Solving the goal contributes to the following tasks:

1. To substantiate the content and sequence of stages of balanced economic growth in Ukraine.
2. To present the components of the innovative environment and the hierarchy of priorities of the state innovation policy.
3. To identify the relationship between the main variables that characterizes the innovative activity and the long-term consequences of innovation for the country.

3. Materials and methods

To solve the set tasks, the following methods are used: systematic, theoretical generalization, analysis, comparative comparison, tabular and graphical presentation of research results.

The information base of the research is made by scientific works of Ukrainian and foreign scientists on the investigated problem. The official statistical base is made up of data from the annual reports of international organizations for 2011–2017.

4. Results

The main condition for the growth of public life is the modernization of the Ukrainian economy. In 2010, Ukraine officially announced the transition to an innovative development model aimed at increasing national competitiveness. The success of economic policy aimed at forming a new model of Ukraine's economic growth is facilitated by a clear choice of priorities, among which, in our view, the main thing is to ensure high rates of sustainable economic growth in the following order:

- restoration of economic growth (increase in revenues from traditional exports, containment of excessive strengthening of the hryvnia exchange rate, re-loading of existing competitive capacities);
- access to high rates and quality of economic growth (increase in labor productivity and competitiveness of the economy, expansion of non-primary exports, market strengthening of the

hryvnia exchange rate, stimulation of investments in basic and human capital, growth of the accumulation rate, expenditure on education, science and health);

– sustainable development (improvement of the quality of life, development of non-primary high-tech exports, new markets for innovative products, convergence of the parameters of the nominal exchange rate and PPP, development of global innovation markets, management of global production chains).

Prospects for ensuring high rates of sustained economic growth depend on the potential of the innovative environment at each of the stages of its development defined above.

According to expert assessments of the World Economic Forum, the peculiarities of the current stage of Ukraine's development caused by the specifics of industrialization processes, the weakness of the economic system, the underdevelopment of the financial and consumer market, form a number of challenges, including: inefficient state management, inaccessibility of financial resources through a credit mechanism and critical scales and rates loss of human capital.

It should be noted that only the state can be the initiator of balanced economic growth of Ukraine. The general influence of the state can be estimated at 80 %. However, this assessment will be effective in the conditions of high rates of annual economic growth (at a level of not less than 10 % [10]), ensured by the interaction of public authorities as a single economic complex – coordination of monetary measures (changing the mechanism of money supply, the use of the mechanism of lending rates, incentives savings and raising the rate of accumulation) and fiscal (the creation of macroeconomic stability and the stability of public finances) policies as factors in providing economic resources development (investment promotion).

Accumulating resources, in particular knowledge, is the driving force behind balanced economic growth. Research, accumulation of human capital (education and training) play an important role in ensuring per capita income growth in the long term [11], since the higher the level of human capital that the country has, the higher the productivity of labor, ensures a sustainable level and the quality of economic growth. Therefore, the formation of an innovative environment (the basic conditions for social life and the conditions for the emergence of research), the opportunities for effective use of resources in priority areas of development of the Ukrainian economy, is urgent.

The experience of economically developed countries shows that the economic progress of society is provided by innovations, as a result of the combination of the possibilities of scientific and technological progress with economic needs. To develop innovations, it is necessary to have an environment favorable for scientists, entrepreneurs and innovators. This thesis is widely recognized and formulated in strategic documents of countries that have reached a high level of innovative development. Therefore, for the purposes of our research, it is proposed to structure the notion of an “innovative environment”, define a hierarchy and study the priority of the main instruments of Ukraine's innovative policy in comparison with the countries of the world.

An innovative environment is a combination of internal factors and external conditions of participants in innovative activity that are formed by the interaction of interrelated socio-economic elements and provide a synergetic effect aimed at generating innovations (**Fig. 1**).

The internal environment of innovations reflects the availability of opportunities for effective use of resources, the fulfillment of the target task and depends on the company's innovation climate (atmosphere, culture) and the external environment, contributes to or hinders innovative development.

The national innovative system is characterized by a given structure and a certain degree of ordering, which provides for sufficient stability of institutional interaction [14, 15]. The national innovative system consists of two main elements:

– organizations, formal structures, consciously created to realize a specific goal. They are the main subjects of the innovation process [16] (higher education institutions, research organizations, venture funds and government agencies that develop and implement innovative policies);

– institutions of state regulation, which are a system of generally accepted rules, legislative acts regulating relations between individuals, groups and organizations [17]. The state pursues a policy in the field of innovation, forms mechanisms for interaction between actors within the innovative system, creates prerequisites for accelerated overflow of knowledge and technology between them, which, in our opinion, determines the overall effectiveness of the national innovative system.

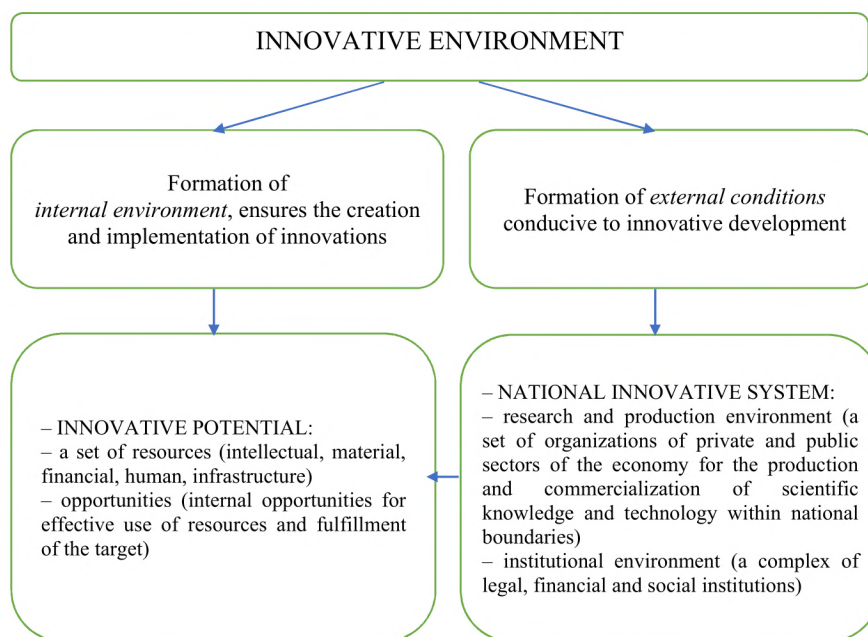


Fig. 1. Components of the innovative environment. Compiled by the author on the basis of sources [12, 13]

Within the framework of innovative policy, public authorities determine the objectives of the innovative strategy and mechanisms for supporting priority innovative programs and projects (direct financial support for innovative processes, fiscal incentives for innovators, legal, infrastructure, economic and political tools to support innovation).

The hierarchy of priorities of the state innovation policy can be represented by the largest content elements of the national innovative system, arranged in the following hierarchical structure:

- the basic institutions of the state (basic conditions for public life: public, political, economic);
- knowledge (conditions for the emergence of research: general education, higher education, research and development);
- culture (conditions for development: the relevance of innovation, the prestige of innovation, the vision of the future);
- infrastructure (conditions for activities: physical/territorial, information, logistics);
- markets (commercialization: financial, technological, intellectual);
- financing of basic research (grants, scholarships, prizes, equipment);
- financing of innovative companies (direct financing, indirect financing instruments).

An intermediate but significant result of the development of all components of the national innovative system is the availability and activity of the innovation process. At this level, programs of fundamental scientific research and innovative development are developed for a long-term period, industry and technological priorities are determined for further government support:

- innovative activity (organization-innovators, employment in innovations);
- innovative results (innovative products, created technologies, obtained patents, profits, capitalization).

Long-term consequences for the economy and society are innovative development and economic growth, the interrelation of which is determined by the increase in labor productivity and production efficiency in all sectors of the economy:

- long-term consequences of innovation (sustainable economic development, country leadership in international markets, growth of aggregate factor productivity and living standards).

As noted earlier, innovative development of the country depends on the development degree of the components of the national innovative system. Priorities of innovative policy should be directed, first of all, to the formation of a system of development institutions, the creation of

technological platforms, the development and implementation of innovative projects, the upgrading of Ukraine's ratings in international ratings on innovative development. It is noteworthy that the concentration only on local achievements of innovative policy, in particular the search for sources of financing for individual projects, will entail only a slowdown in the country's innovative development and a backlog from the leading countries.

Formation of the innovative environment provides for a qualified management, built on information support. International organizations and analytical companies, in particular the World Bank and RAND Corporation, are assessing the level of innovative development of countries. The most famous measures of innovation in countries are:

- Global Innovation Index, analytical center of the Lausanne School of Business INSEAD, Switzerland (indicators of innovative development: the country's innovative potential and the conditions for its implementation) [18];
- Global Innovation Index BCG, Boston Consulting Group, USA (indicators of innovative development: conditions and factors of innovative development) [19];
- Innovation Capacity Index, International Research Structure of EFD, Global Consulting Network, Spain (indicators of innovation development: institutional environment, human capital, regulatory policy, feasibility of research and development, use of information and communication technologies) [20];
- Innovative index of the European innovation board (Summary Innovation Index), European Commission PRO INNO EUROPE (indicators of innovative development: resources, opportunities, innovative activity of firms, results) [21].

The methods for calculating these indices differ significantly between each other in terms of purpose, methodology of calculation, the range of covered countries, the list and composition of indicators, the coverage degree of innovation results, the algorithm for integrating information, and the like.

For our further research let's use the data of the Global Innovation Index, as it is characterized by the complexity of determining the significance of innovative development of countries, creating an enabling environment for innovation and obtaining results from it. Index indicators are partial indicators, the estimated values of which are used to measure the innovative development of countries.

Proceeding from the fact that the national innovative system is determined by three key components, such as: the fundamental conditions that are provided by the state, the innovative activity and interaction of participants in order to achieve results that have economic and social values for society, let's estimate the relationship between the result of innovation (Innovation Output), the contribution of innovation (Innovation Input) and aggregate factor productivity (Growth Factor Productivity) using the Principal Components and Classification Analysis method in the software package Statistica 10.0. The criteria for selecting a particular country are the place in the international rating for innovative development and the level of income according to the World Bank classification. For the analysis, factors were used such as: institutions; human capital and research; infrastructure, market development, business development, knowledge and technology, output; creative release.

Table 1 presents a matrix of correlations between innovative contribution variables and the main components for each of the groups of countries. The method of the main components allows to explain the relationship between the variables by means of several factors that can't be directly measured. As a result of the factorization from the correlation matrix, a different number of factors were identified for each of the groups of countries. The factor matrix shows which variables each factor has generated.

According to the results of the analysis, the first three factors were determined, they correspond to the quality of the representation in the amount of 86.8 % (Quality of representation ≥ 70 %, Numbers of factors ≥ 2) for a group of high-income countries), 83.3 % for a group of countries with a level income above the average and 80.9 % for the group of countries with incomes below the average. Proceeding from the fact that the value of the factor load is significant, it is determined in the software package Statistica 10.0 at the level of 0.7 on the module, for the group of countries with

a high level of income the factor matrix is represented by Factor 1 “Institutional environment and business” containing a set of such variables, such as “Institutions” and “Business Development”.

For a group of countries with an income level above the average, the factor matrix is represented by Factor 1 “Scientific and production environment” (“Human capital and research”, “Market development” and “Business development”). Factor 2 “Institutional environment” is represented by the variable “Institutes”.

Table 1

Matrix of correlation of factors of innovative costs and total factor productivity of the countries of the world for the period of 2011–2017

Variables (Average value by countries) for correlation analysis	Factor coordinates of variables based on correlation		
	Factor 1	Factor 2	Factor 3
The World Bank Group of High-Income Countries (Sweden, USA, Great Britain, Singapore, Germany, South Korea)			
institutes	−0.86	0.16	−0.15
human capital and research	−0.48	−0.68	0.43
infrastructure	−0.24	−0.68	−0.67
market development	−0.65	0.45	−0.35
business development	−0.86	0.06	0.36
<i>Explained variation, %</i>	<i>44.70</i>	<i>23.40</i>	<i>18.69</i>
The World Bank Group of Above the Middle-Income Countries (China, Bulgaria, Malaysia, Romania, Turkey, Thailand)			
institutes	0.06	−0.92	0.36
human capital and research	−0.81	−0.12	0.08
infrastructure	−0.41	−0.35	−0.82
market development	−0.86	0.07	0.13
business development	−0.80	0.15	0.23
<i>Explained variation, %</i>	<i>44.80</i>	<i>20.60</i>	<i>17.84</i>
The World Bank Group of Lower the Middle-Income Countries (Vietnam, Ukraine, Armenia, India, Philippines, Indonesia)			
institutes	−0.39	−0.77	0.15
human capital and research	0.71	−0.46	−0.14
infrastructure	−0.71	0.36	0.41
market development	−0.63	−0.56	0.01
business development	0.63	−0.11	0.74
<i>Explained variation, %</i>	<i>39.76</i>	<i>25.69</i>	<i>15.46</i>

Note: calculated by the author according to sources [22–25]

For a group of countries with incomes below the average, the factor matrix is represented by Factor 1 “Research and Production Environment”: (“Human Capital and Research” and “Infrastructure” and “Business Development”). Factor 2 “Institutional environment” is also represented by the variable “Institutions”.

According to the obtained new variables of Factor 1 and Factor 2, the fundamental elements (the basic conditions for social life) of the innovative environment, in particular the “Institutions”, influence the decisions of enterprises to invest in the innovative activity of all groups of countries. However, let’s note that the eigenvalues of the variables that make up Factor 1 “Institutional environment and business” of a group of high-income countries explain 44.70 % of the total variation, reflecting the significance of a certain factor.

For middle- and lower the middle-income countries, only 20.60 % and 25.69 %, respectively, of the variation in the source data for the “Institutions” of Factor 2 “Institutional Environment” explain. The strengths of the national innovative system of these groups of countries are “Human Capital and Research”, “Market Development”, “Business Development” and “Human Capital

and Research”, “Infrastructure” (Factor 2 “Scientific and production environment” 44.80 % and 39.76 %), respectively.

Also let’s note that the factor load factor variable “Market Development” of Factor 1 for the group of middle-income countries has the greatest factor load among the set of variables. Proceeding from the fact that the countries represented by the representative sample (China, Bulgaria, Malaysia, Romania, Turkey, Thailand) had rapid economic and innovative development, which provided them with leading positions according to the experts of the LOSAN Business School INSEAD (Global Innovation Index) among the countries the group with incomes above the average (the average score for the countries in 2011–2017 is 49.42, the minimum score is 41.8 maximum – 63.9), let’s conclude that the indicators of the financial market (credit, investments, market capitalization, supply venture capital) product market (trade, competition) and the effectiveness of the legal system (investor protection). This is due to the fact that technological development alone can’t provide economic growth, it requires significant investments through the mechanisms of the financial market and the provision of investment liquidity.

Insufficient development of financial markets in countries with economies in transition (Vietnam, Ukraine, Armenia, India, Philippines, Indonesia) does not mean that these markets do not affect economic growth (factor loadings of variable “Market Development” is 0.63). The growth in lending and financing in the process of restructuring production is of stimulating importance for balanced economic growth, accelerating the accumulation of fixed capital and increasing production efficiency. The main feature of the markets of countries with economies in transition is low monetization and weak financial flows, one of the reasons for which is a rigid anti-inflationary policy.

Let’s note that the data of the Global Innovation Index, which use during the research, do not reflect the hierarchy of priorities of the state innovative policy, since they have elements of a certain fragmentation aimed at determining the factors of innovative development of countries (the country’s innovative potential and the conditions for its implementation). In this regard, the question arises of calculating an integral indicator that takes into account the synthetic approach to determining the priority of development of the content elements of the national innovative system of the country and highlighting the importance of the state, human capital, research, financial and commodity markets in the balanced economic growth of the country:

The main advantage of calculating the integral indicator is, in the author’s opinion, the ability to compare the degree of development of each component of the innovation policy of different countries in the dynamics with a view to further making sound management decisions to identify sources and priorities for financing innovative development. Taking into account that the complex characteristic of the national innovative system of the country provides for the use of indicators, comprehensively highlights the features of the state innovation policy and the organic interrelationship of individual indicators, the development of a methodical approach is proposed to be carried out using taxonomic analysis. The construction of an integrated indicator of the assessment of the national innovative system of countries provides for the use of an international comparison base (the Global Innovative Index, the Global Competitive Index, The Bloomberg Innovation Index and the Forbex World’s Most Innovative Companies) in accordance with the components of the state innovation policy:

- the basic institutions of the state (protection of intellectual property, the quality of protection of investors’ and property rights, barriers to the export of products, ease of registration of enterprises, simplicity of taxation, efficiency of public administration);
- knowledge (expenses for education, quality of research institutes, the place of the country in the ranking of QS universities, international cooperation of institutes, accessibility of training services, graduates of engineering and scientific specialties);
- culture (degree of hierarchy, degree of individualism, degree of ambition, degree of pragmatism);
- infrastructure (access to information and communication technologies, quality of logistics services, environmental policy assessment);
- financial markets (availability of financing (venture capital, private equity, borrowing));

- commodity markets (intensity of competition, level of development of clusters);
- financing of basic research (state expenditures on R & D in research institutes and higher educational institutions);
- financing of innovative companies (state spending on R & D in the private sector, financing of R&D by business).

The use of the data of the proposed integrated indicator of the national innovative system of Ukraine will be an effective tool for identifying priority tools of the state innovative policy necessary for the development of the innovative environment.

5. Discussion of results

In connection with the strengthening of the role of innovative development in society, the study of the main criteria of innovative development indexes is becoming topical. Let's agree with the authors' opinion [26] that experts from many international organizations are developing innovation development indices that are of an applied nature, highlight the main results of theoretical studies and methodological improvements in practice.

Proceeding from the fact that innovative development is a complex and multifaceted process, the scientist [27] proposes to strengthen the influence of innovative factors on the development of the national economy of Ukraine: to form an institutional environment favorable to the development of innovation and technological activity, to increase the amount of allocations for scientific research and scientific technical develop, strengthen the role of business in providing funding for scientific, technical and innovation processes.

With the research results of the innovative national system of Ukraine and the countries of the European Union, economists [28] came to the conclusion that the choice of indicators for the evaluation of innovative policy is a big problem, and the available mechanisms for creating knowledge and innovations require the use of different indicators.

Analyzing the activities of the state on the development of a knowledge-based economy, the researchers [29] note the need to take into account such fundamental points as: the state's interest in the innovation process and the organization of a control system for effective management, use of innovation results and feedback from the subjects of all levels of the economy, with which we can't agree.

According to the experts of the European Union, by 2020 Ukraine has the opportunity to gain leadership in the group of countries "Moderate Innovators" (according to the European innovation board score). This contributes to the outline of the priorities for building innovative capacity at the macro and micro level, in particular, the creation of a managed innovation model of the country's development through the approval of national priorities, the launch of strategic development programs, the unification of domestic scientific developments, personnel support, the production sector and business.

To the abovementioned opinions of scientists, let's add that the deterrent factors in the development of the national innovative system that provides the conditions for innovation in Ukraine is the lack of funding sources, the high cost of credit, the devaluation of the national currency, the imperfect legal framework, the low level of investor confidence, the lack of incentive measures for innovation similar. This actualizes the issue of determining a set of indicators, which, on the one hand, reflect all stages and stages of scientific, technical and innovation activities, results and impact on the development of the country's economy. On the other hand, aimed at improving the criteria and principles of the hierarchy of priorities for supporting innovation by the state, business and financial market.

6. Conclusions

1. It is substantiated that the scientific and innovative way of development of economic systems is objectively the initial stage of the formation of a postindustrial society. Overcoming the economic development gap between Ukraine and developed countries, maintaining competitiveness in the global economy, ensuring the stable development of the Ukrainian economy, it is necessary to consistently pass through the stages (restoring economic growth, achieving high rates and

quality of economic growth, sustainable development) of balanced economic growth, an increase in the quality of life, an increase in aggregate factor productivity.

2. It is proved that innovative development of the country is provided by an innovative environment, the main components of which are internal (innovative potential) and external (national innovative system) environment.

3. It is determined that the state, as the main subject of the country's innovative activity, ensures the implementation of innovative processes and legal regulation of relations. The peculiarity of state regulation of high-income countries is determined by the balance of innovative policy instruments. The institutional environment ensures the effectiveness of financial support of the business, obtaining high results from innovations and retaining the leading position on innovative development.

State regulation of innovative development in groups of countries with incomes above and below the average is considered as a secondary component of the national innovative system. To make decisions on investment in innovative activities and further innovative development, financial markets, commodity markets and the effectiveness of the legal system are of great importance. For low-income countries, market development has a stimulating effect on economic growth.

4. Fragmentation of the definition of factors of innovative development according to the Global Innovation Index gave grounds to provide recommendations (integral indicator) for determining the degree of priority development of the content elements of the national innovative system, which will help determine the main tools of innovative policy and the criteria for their evaluation.

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ANALYSIS OF THE SHADOW ECONOMY AND ITS FISCAL EFFECTS IN UKRAINE

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Abstract

This article analyses the share of shadow economy in Ukraine and its effects on the domestic fiscal sphere. It was made an attempt to calculate the approximate tax losses, which was resulted by the informal sector of economy. Also, we tried to search the influence of the shadow economy on the consolidate budget revenue, expenditures and deficit. The results of this paper are:

- 1) the level of the shadow economy in Ukraine during last 5–10 years is between 34–43 % of GDP;
- 2) the annual average tax losses are about 15.4 % of official GDP, of which 10.4 % is the losses of central and local budgets, 5.0 % is the losses of Ukrainian Pension Fund;
- 3) it was empirically proven the influence of the shadow economy on the amount and the structure of expenditures of Consolidated Budget of Ukraine. We found strong support that the bigger size of informal sector leads to the reduction of the capital expenditures' share in the general expenditures of Consolidated Budget of Ukraine.

JEL Code: E620, O170, H260, H200, C 100.

Keywords: shadow economy, tax losses, consolidated budget, tax revenue, budget expenditure, budget deficit, tax ratio, Ukraine.

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1. Introduction

Shadow economy is one of most painful problems for a government of any country, especially it concerns Ukraine, where the share of informal sector is considered by scientists as the most in Europe. The great shadow economy volume has an essential negative influence on the financial and economic environment in Ukraine. The shadow economic activity is mainly provoked by the desire of economic subjects to avoid tax payments. Thus, the state suffers from financial losses as a shortening of budget revenues that results in its deficit increase, expenditures decrease or deformation or their structure and so on.

A fiscal crisis in Ukraine that annually causes the growth of the existent national debt threatens the state finances stability. Its overcoming needs a search for additional sources to fill the budget. From our point of view, the shadow economy occupies a special place among them. Widening of the tax base by de-shadowing of the hidden GDP allows the state to involve additional financial resources for covering the existing budget deficit. But before realizing any arrangements for de-shadowing in Ukraine, it is urgent to study peculiarities of the shadow economy development, dynamics of its volumes and to evaluate fiscal effects, caused by it.

The study of shadow economy volumes in Ukraine is realized in works of the famous Austrian professor, expert in the shadow economy sphere F. Shneider. He published both an individual paper on this thematic [1], and several ones in co-authorship, where he and his colleagues estimated the shadow economy level in many countries of the world, including Ukraine [2, 3]. The results of these researches testify that the shadow economy level in our state is one of highest in the world. It allows us to suppose that de-shadowing of the Ukrainian economy may become an effective instrument for filling the budget and sanitating state finances. The quantitative analysis of the shadow sector and peculiarities of its development in Ukraine as realized in works of native scientists [4, 5]. For this aim there were used data, offered by both foreign experts and native state organizations.

Fiscal results, caused by the shadow economy, were theoretically studied in the work by P. Pirnykoza [6]. In their turn, empirical studies on this thematic were realized in works [7, 8]. Thus,

they mainly estimated tax losses as a result of the shadow sector functioning in countries-members of the European Union and OECD.

Despite the series of analyzed researches, it can be stated, that the complex estimation of fiscal results of the shadow economy was not realized in Ukraine during the last years, as opposite to European countries. It causes the topicality of this research.

2. Aim of research

The complex study of shadow economy volumes and fiscal results of its functioning in Ukraine.

3. Materials and methods of research

At realizing this scientific study, there were used general scientific and special methods. Among them the most important are: abstract-logic method; statistical methods; method of comparative analysis and synthesis; calculating-analytic method, method of correlation-regression analysis and so on.

The information base of the research is analytic and statistic reports of Ukrainian and world organizations, especially, the State fiscal service of Ukraine, State statistic service of Ukraine, State treasury service of Ukraine and so on; works of native and foreign scientists on problems of economy de-shadowing and economic security.

4. Results

4. 1. Analysis of shadow economy volumes in Ukraine

The estimation of shadow economy volumes is rather complicated task, because of the activity of economic subjects functioning in the shadow sector is hidden. The problem of determining volumes of the hidden activity is also connected with absence of an integral methodology of estimating this phenomenon that gives distinct results and is used in all countries of the world. So, the volume of shadow economy in Ukraine may be known of three sources: studies of the Ministry of economic development and trade of Ukraine (farther – MEDTU), studies of the State statistic service of Ukraine (farther SSSU) and foreign studies by F. Shneider and his colleagues from the World Bank. Unfortunately, despite the great interest of Ukrainian scientists to the shadow economy, the permanent estimation of its volumes is not realized by them.

The results of the aforementioned studies differ from each other because of using different methods of the shadow economy estimation. Thus, foreign scientists most often use MIMIC-method (Multiple Indicators Multiple Causes Method). It provides that a shadow economy volume is a latent variable, connected on the one side with a certain number of observed indicators (that reflect changes in shadow economy volumes), on the other one, with a set of observed causal variables, considered as most important determinants of the hidden economic activity. Having determined these indicators and variables, we can estimate a shadow economy volume by econometric methods. It is remarkable that at changing collected indicators and variables, obtained results of the shadow economy level change too. So, the shadow economy level in Ukraine in the same year varies in different works of some foreign authors. Such difference may be observed in these three researches [2, 3], which author or co-author F. Shneider is. Totally, the shadow economy level in Ukraine, calculated by foreign scientists, varies within 40–47 % of the official GDP. Thus, the result of one of most complex researches [2] demonstrated that the average shadow economy level in Ukraine for the period 1991–2015 was 44.8 %. This index is the second after Georgia in Europe and 24-th among 158 studied countries of the world. Only such countries as Zimbabwe, Haiti, Gabon, Honduras and other ones are below. According to obtained data, the highest shadow economy level in Ukraine was 57 % of GDP in 1998, the lowest one – 36.7 % of GDP in 2008.

SSSU elaborated methodological principles of calculating shadow economy volumes (official name “non-observed economy”) [9], that correspond to international standards of the System of national calculations (SNC-93), and uses them regularly. Correspondent principles were elaborated for increasing the quality of GDP estimations, which calculation includes shadow sector volumes [10]. According to this methodology, the shadow economy calculation is based on data

of annual state statistic observations and administrative information. Its results indicate that the shadow economy level in Ukraine varies within 15–20 % of GDP.

MEDTU uses own methodology, approved by the correspondent order [11] for calculating the shadow sector. This order gives an integral native official definition of the shadow economy: “economic activity of an economic subject, not registered in the established order, characterized by minimization of expenditures for producing goods, making works and giving services, avoiding taxation, fees (compulsory payments), statistic polling, which result is violation of legislative norms (minimal wages level, working day duration, labor conditions and safety and so on)”. According to the established methodology, the main methods that help to calculate shadow economy volumes is:

- 1) «population’s expenditures – retail commodity turnover»;
- 2) «electric method»;
- 3) «monetary method»;
- 4) «financial method».

The aforesaid methods of estimation of shadow economy volumes include different spheres of the national economy, so their use demonstrates different results of shadow sector volumes. So, MEDT deduces an integral parameter, based on these methods. It characterizes the shadow economy in Ukraine complexly. Its value varies within 34–43 % of GDP last 5 years.

For comparison, the results of all three estimations of the shadow economy are presented on Fig. 1.

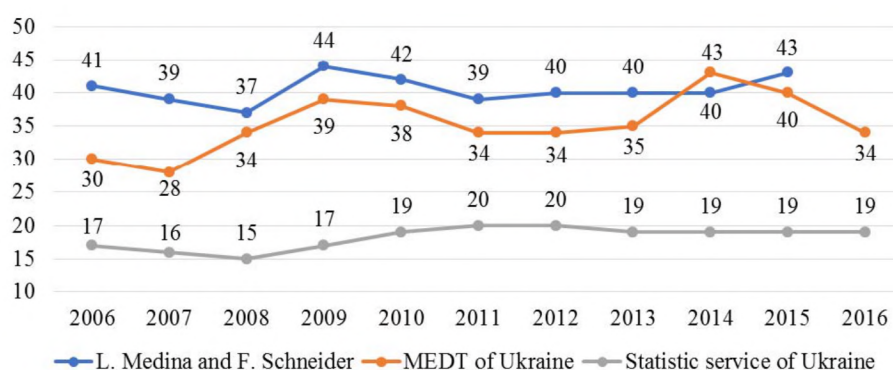


Fig. 1. Shadow economy level in Ukraine, calculated by different methods, % of GDP.

Source: according to data [2, 12, 13]

Comparing the results of calculations of the shadow economy level by two native state organizations, the great difference between them must be noted. If according to SSS of Ukraine, this index for the period 2006–2016 never exceeded 20 % of GDP, the correspondent MEDT data demonstrate that its lowest value was fixed in 2007 and was 28 % of GDP. From our point of view, the indices, offered by SSSU, look a bit non-realistically low comparing with other native and foreign studies, none of which considers the Ukrainian shadow sector as less than 1/3 of GDP. Moreover, the shadow sector level indices, calculated by SSSU, almost don’t react on economic conjuncture changes. It is impossible in practice and contradicts to all theoretical bases of the shadow economy. Thus, during the world economic crisis of 2008-2009 the shadow sector level, according to SSSU, was lower than during the relatively stable economic period 2010–2013, that may be doubted. According to the same data, the shadow economy level didn’t undergo noticeable changes also after revolutionary events in Ukraine in 2014, whereas calculations of all other studies demonstrated its growth. Despite the fact that we consider SSSU indices as something incorrect, we’ll take them into account at the further analysis and calculations, because they are included in the officially calculated GDP of Ukraine.

Comparing the results of calculations by MEDTU and foreign researchers, let’s note that researches of former ones usually demonstrate a bit higher level of the shadow economy in Ukraine. If in 2006–2007 this difference was more than 10 p.p., starting from 2008 it varied within 3–7 p.p., at that the result least differed in the period 2009-2014. From our point of view, it testifies to the fact

that introduction of new methodical recommendations of calculating the shadow economy level in 2009 for MEDT had a positive influence on the estimation distinctness. At the further analysis of fiscal and economic results of the shadow sector functioning in Ukraine we'll use MEDT data, because, at first, they are official, at second, during the last years they don't essentially differ from ones of other foreign studies, at third, may be most distinct because of MEDT possibility to obtain more distinct information, necessary for calculating the shadow economy, from state authorities.

4. 2. Calculation of tax losses through the shadow economy of Ukraine

Functioning in the shadow economy sector, any economic subject pursues the one aim – maximization of personal profits. The hiding of economic activity is inseparably connected with the full or partial non-declaring of incomes from it that allow an entrepreneur to leave non-paid taxes to him/herself, so to get financial advantages over competitors. At the same time such maximization of personal profits by each separate entrepreneur causes essential damages to social ones, because non-paid taxes is the lost financial resource that must help state to satisfy social needs. Thus, the main fiscal result of the shadow economy is tax losses.

The calculation of tax losses from the shadow economy of Ukraine needs first of all to define a tax ratio – an index that reflects the part of GDP, redistributed by central funds of assets using taxes. In other words, it reflects the real level of fiscal load in a country. In this research we have calculated it in **Table 1** by the following formula:

$$TR = \frac{TP + R_{uif}}{GDP_{of.tax}}, \quad (1)$$

where TR – tax ratio; TP – tax proceeds, mln hrn; R_{uif} – revenue of payments to the funds of the obligatory state insurance, mln hrn; $GDP_{of.tax}$ – officially taxed gross domestic product ($GDP_{of} - GDP_{shSSU}$) mln. hrn.

The obtained results indicate that in the period 2006–2016 the fiscal load varied within 40.3–47.8 % of GDP. Till 2010 this index had an inessential tendency to decrease, but after activating the tax code, it became to growth, in first turn, at the expanse of budgetary taxes and not social fees (UIF). The fiscal load had reached the highest level in 2012, then it got the constant tendency to decrease and became the least in 2016 at the expanse of liberalization of rates of the unitary fee for the common obligatory social insurance. It must be noted, that after the abrupt change of the political vector in 2014, the budgetary tax load has a tendency to increase, connected with the need of the Consolidated budget of Ukraine (farther CBU) in additional financial resources. It especially concerns the State budget of Ukraine because of the need in financing such directions as defense, serving the national debt and covering the increasing deficit of the Pension Fund of Ukraine [14].

We used the calculated tax rate for calculating state tax losses that include both losses of the Consolidated budget of Ukraine and losses of funds of the obligatory social insurance. Fiscal losses during 2006–2016 are calculated in **Table 2** by the formula:

$$TL = GDR \times \frac{SE}{100} \times TR, \quad (2)$$

where TL – tax losses; SE – shadow economy level;

The results of the calculations demonstrated that average tax losses as a result of the shadow economy in Ukraine in the period 2006–2016 were near 15.4 % of the official GDP. In the period 2009–2015 their volume was stably higher than its mean value, instead of it in the period 2006–2008 and 2016 – lower. The abrupt decrease of tax losses volumes in 2016 is mainly connected with the shadow economy level decrease and general fiscal load decrease. Tax losses may be conventionally divided in ones of the budget and ones of the state funds of social insurance. The obtained results testify that CBU get less taxes in average by 10.4 % of GDP, funds of state social insurance, in their turn, lose financial resources as 5.0 % of GDP.

Table 1
Calculation of tax ratio in Ukraine

Year	Nominal GDP, ml. hrn	Officially taxed GDP (decreased by SE level, calculated by SSS of Ukraine), mln hrn.	Tax revenues of the Consolidated budget of Ukraine, mln hrn	Revenue of payments to funds of state social insurance, mln hrn	Budgetary tax load, % of GDP	Load of payments of social insurance, % of GDP	Tax ratio
2006	544 153	450015	125 743	75 843	27.9	16.9	0.448
2007	720 731	609018	161 264	95 473	26.5	15.7	0.422
2008	948 056	804900	227 165	117 091	28.2	14.5	0.428
2009	913 345	760816	208 073	111 119	27.3	14.6	0.420
2010	1 079 346	874270	234 448	134 259	26.8	15.4	0.422
2011	1 299 991	1037393	334 692	152 242	32.3	14.7	0.469
2012	1 404 669	1129354	360 567	178 700	31.9	15.8	0.478
2013	1 465 198	1188276	353 968	188 600	29.8	15.9	0.457
2014	1 586 915	1290162	367 512	181 128	28.5	14.0	0.425
2015	1 988 544	1610721	507 636	185 790	31.5	11.5	0.431
2016	2 383 182	1939910	650 782	131 827	33.5	6.8	0.403

Source: formed by the author, according to the data of the State statistic service, reports about completion of budget of the State treasury service of Ukraine, funds of obligatory state social insurance

Table 2
Calculation of tax losses as a result of shadow economy in Ukraine

Year	GDP, mln hrn	SE level, % of GDP	Budgetary TL, %	Load of social insurance payments, %	TR	Tax losses of CBU, mln hrn	Tax losses of CBU, % of GDP	Losses of state social insurance payments, mln hrn	Losses of state social insurance payments, % of GDP	Total tax losses, mln hrn	Total tax losses, % of GDP
2006	544 153	30	27.9	16.9	0.448	45 614	8.4	27 513	5.1	73 127	13.4
2007	720 731	28	26.5	15.7	0.422	53 437	7.4	31 636	4.4	85 073	11.8
2008	948 056	34	28.2	14.5	0.428	90 973	9.6	46 892	4.9	137 865	14.5
2009	913 345	39	27.3	14.6	0.420	97 417	10.7	52 025	5.7	149 442	16.4
2010	1 079 346	38	26.8	15.4	0.422	109 988	10.2	62 986	5.8	172 974	16.0
2011	1 299 991	34	32.3	14.7	0.469	142 601	11.0	64 865	5.0	207 466	16.0
2012	1 404 669	34	31.9	15.8	0.478	152 479	10.9	75 570	5.4	228 048	16.2
2013	1 465 198	35	29.8	15.9	0.457	152 761	10.4	81 393	5.6	234 154	16.0
2014	1 586 915	43	28.5	14.0	0.425	194 379	12.2	95 800	6.0	290 179	18.3
2015	1 988 544	40	31.5	11.5	0.431	250 684	12.6	91 748	4.6	342 433	17.2
2016	2 383 182	34	33.5	6.8	0.403	271 825	11.4	55 063	2.3	326 888	13.7

Note: SE – shadow economy; TL – tax load; TR – tax ratio; CBU – Consolidated budget of Ukraine

Source: calculated by the author, according to the data of the State statistic service, reports about completion of budgets of the State treasury service of Ukraine, funds of obligatory state social insurance

4. 3. Other fiscal results of shadow economy

The high shadow economy level and essential volumes of tax losses as a result of its functioning decrease financial possibilities of the state and provoke the budgetary deficit that prevents the policy of fiscal consolidation. It must be noted, that there is the permanent problem of imbalance of domestic budgets. Thus, in the period 2006–2016 the budget balance never had a surplus value, moreover in five of eleven studied years CBU deficit exceeded the maximal permissible volume as 3 % of GDP (Table 3).

It was impossible to set a direct correlation between the CBU deficit volume and shadow economy level empirically. It is connected with the policy of budget balancing, conducted by the public authorities. Under conditions of the lack of financial resources for decreasing the deficit level, budgetary expenditure volumes decrease maximally. So, shadow economy volumes influence the volume of the budget expenditure share. Our regression analysis proves such assumption. Yes, there is a rather close negative linear connection (**Fig. 2**) between growth rates of real CBU expenditures (**Table 3**) and shadow economy level, correlation coefficient is -0.7065 . This correlation is described by the model $y = -2.0312x + 1.7619$, approximation coefficient (R^2) of this model is 0.4991. Thus, we make the conclusion that the shadow sector growth decelerates the growth of real CBU expenditures.

Table 3

Calculation of the deficit, real volumes of expenditures and capital expenditures of the Consolidated budget of Ukraine

Year	Official GDP, mln hrn	CBU incomes, mln hrn	CBU expenditures, mln hrn	CBU deficit, mln hrn	CBU deficit, % of GDP	Index of consumption prices (till December 2010)	CBU, real expenditures, mln hrn	Growth rate, %	CBU Capital expenditures, mln hrn	CBU Capital expenditures, % of GDP
2006	544 153	168 626	175 284	6 658	1.2	0.572	306 441	—	24 536	4.5 %
2007	720 731	219 937	226 054	6 118	0.8	0.667	329 740	107.6 %	38 690	5.4 %
2008	948 056	297 893	309 204	11 311	1.2	0.816	378 926	114.9 %	41 153	4.3 %
2009	913 345	272 967	307 399	34 432	3.8	0.917	335 223	88.5 %	20 052	2.2 %
2010	1 079 346	314 506	377 843	63 337	5.9	1.000	377 843	112.7 %	30 648	2.8 %
2011	1 299 991	398 310	416 854	18 543	1.4	1.046	398 522	105.5 %	41 947	3.2 %
2012	1 404 669	445 454	492 455	47 000	3.3	1.043	472 152	118.5 %	40 745	2.9 %
2013	1 465 198	442 743	505 844	63 101	4.3	1.049	482 215	102.1 %	29 380	2.0 %
2014	1 586 915	456 067	523 126	67 058	4.3	1.309	399 638	82.9 %	20 200	1.3 %
2015	1 988 544	652 031	679 871	27 840	1.4	1.877	362 212	90.6 %	46 753	2.4 %
2016	2 383 182	782 859	835 832	52 973	2.2	2.109	396 317	109.4 %	73 130	3.1 %

Source: calculated by the author, according to the data of the State statistic service, reports about completion of budgets of the State treasury service of Ukraine

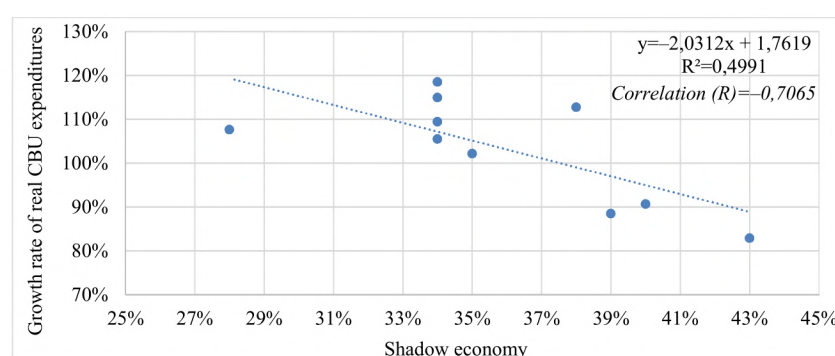


Fig. 2. Correlation between shadow economy and growth rate of real CBU expenditures in the period 2006–2016

Source: calculated by the author

Imbalance of state finances in Ukraine, manifested by the constantly existent negative budget balance, resulted in increasing the consolidated national debt. Its volumes moderately grew from 12.1 % of GDP in 2006 to 32.8 % of GDP in 2013, and as a result of the economic disturbance because of revolutionary events reached the minatory 69.3 % of GDP in 2016 that exceeded the

Maastricht criterion as 60 % debt of GDP. The gradual change of the structure of CBU expenditures took place together with the debt growth. Thus, annual expenditures for debt servicing grew from 0.5 % of GDP in 2007 to 4.0 % of GDP in 2016. Such growth took place at the expense of shortening expenditures for other extremely important directions such as health protection (from 3.7 % of GDP in 2007 to 3.2 % of GDP in 2016), education (from 6.2 % to 5.4 %), economic activity (from 5.6 % to 2.8 %), general state functions (2.9 %–1.6 %) [14].

The decrease of financing these directions has no positive influence on the quantity and quality of social services, provided by the state. Thus, the Government Effectiveness index in Ukraine in 2016, calculated by experts, was one of the lowest in Europe [15]. The low effectiveness of the work of the state sector is conditioned by the low wage level in it that also stimulates the corruption development that is a complementary component of the shadow economy in developing countries (that is testified by the empirical study [16]).

The growth of the debt load on the budget together with the necessity of the budgetary support of the impoverished population and lack of budget resources caused the decrease of an investment component of the domestic budget, namely capital expenditures of CBU from 5.4 % of GDP in 2007 to 3.1 % of GDP in 2016 (Table 3). The shortening of development expenditures will have essential negative socio-economic effects in future, because the untimely recreation of main funds of the state property will result in their final moral and physical destruction. The conducted regression analysis (Fig. 3) demonstrates the negative correlation ($R=-0.8842$) between the shadow economy level in Ukraine and CBU capital expenditures. This correlation is described by the linear model $y=-0.2457x+0.1179$, and its reliability is proved by rather high approximation reliability coefficient (R^2), that is equal to 0.7818. Such results are not unexpected, because at the lack of budgetary revenues, provoked by tax losses through the shadow economy, and because of peculiarities of the democratic politic regime in Ukraine (and not only), under which conditions the shortening of social budgetary expenditures is a complicated task because of a threat of decreasing politic ratings of the ruling elite, so most unnoticeable expenditures for society decrease, namely capital expenditures (ones of future).

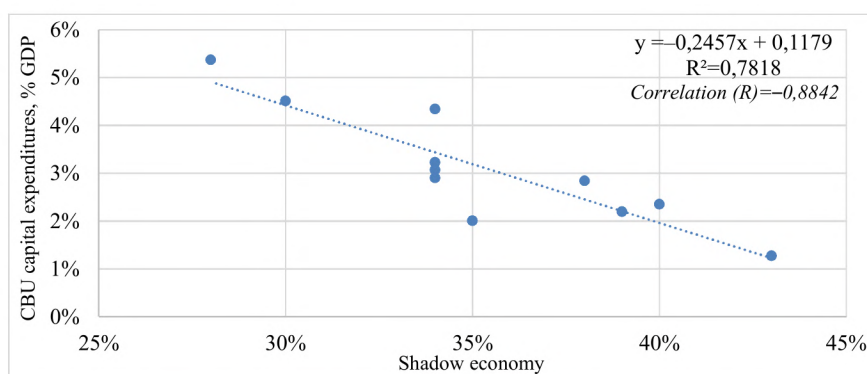


Fig. 3. Correlation between shadow economy and CBU capital expenditures in the period 2006–2016

Source: calculated by the author

5. Discussion of results

Our results prove the theoretical assumptions of the scientific community about the baneful influence of essential shadow economy volumes on the fiscal sphere in Ukraine [17, 18]. This paper, as opposite to other ones, proves this influence by the empirical way that conditions the originality and importance of the research. Comparing the obtained indices of tax losses through the shadow economy in Ukraine with correspondent indices of European countries, calculated in the works by K. Raczkowski and F. Shneider [7, 8], we can make the conclusion that Ukraine is one of European leaders as to losses of tax revenues. Under such conditions it is rather difficult to talk about the possibility of implementing the policy of budgetary consolidation by the government. It is extremely difficult to provide the stability of state finances, if more than 1/3 of GDP of the country is hidden and not taxed.

The results of the study are unique in the context of empirical proof of the shadow economy influence of the volumes and structure of the expenditure budget share. The close negative correlation between the shadow economy level and volumes of CBU capital expenditures has been found for the first time.

From our point of view, in further studies it is important to search for ways of de-shadowing of the Ukrainian economy for augmenting the financial base of the budget. Before that the government must calculate and set the first strategic target (aim) that would cover the existent budget deficit.

6. Conclusions

The following conclusions may be formulated by the research results:

- The analysis of native and foreign studies of the shadow economy testifies to different approaches at calculating its volumes. They are the highest in studies of experts of the World Bank and vary within 40-47 % of GDP. On the contrary, the lowest shadow economy level is determined by the Ukrainian statistic service – 15–20 %. From our point of view, the most distinct are the results of MEDTU that testify – 34-43 % of GDP.

- Ukrainian centralized funds of assets get less tax revenues in average by 15.4 % of GDP, among them losses of budgets of different levels are 10.4 % of GDP and ones of the Pension Fund of Ukraine – 5.0 % of GDP. It must be noted separately, that after the abrupt change of the political vector in 2014, the budgetary tax load has a tendency to increase that is a result of the need of the consolidated budget in additional financial resources.

- Official data testify that the high shadow economy level in Ukraine conditions the permanent deficit of the domestic budget that results in the decrease of budgetary expenditures. The first directions of budgetary financing that suffer from the shadow economy are education, medicine, economic activity. At the same time the informal sector in the first turn conditions the decrease of an investment component of the domestic budget, namely capital expenditures of the consolidated budget.

Our conclusions prove the destructive effect of the shadow economy on state finances in Ukraine and condition the need in conducting further studies in this sphere for searching ways for its leveling.

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PERIODIZATION OF DEVELOPMENT OF ETHNIC RELATIONS OF WESTERN UKRAINE AND POLAND (1918–1939)

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Abstract

The article makes an attempt to investigate the peculiarities and determine the regularities of cooperation between the Ukrainian and Polish states during the time of the Second Rzeczpospolita, to recreate the overall picture of events and their subsequent influence on the relations between the two countries. Analysis of the concepts of activities of various representatives of the Polish government is presented, which helps to prove that Poland's constant struggle for spheres of influence in the international arena led to unpleasant consequences that claimed the lives of the representatives of many nations, including Ukrainians and Poles. At the same time, the struggle of the Polish national chauvinists and the Ukrainian patriotic forces did not allow Ukrainians to defend the sovereignty of its state, since the military-political situation in the region, the position of the Entente countries, as well as the ethnic relations of the region did not contribute to this. The attempt to normalize the Ukrainian-Polish relations in the Second Commonwealth did not bring the expected results because it was not seen by the government as a positive solution to the problem. Having negatively impacted the life of Ukrainians, these actions were remembered as the last wasted attempt to improve the situation on the eve of the Second World War. Ukrainians in such a difficult situation were forced to adjust to the requirements of time, and therefore quite often changed the vector of activity toward the cultural and social direction. The intellectuals were fighting for the right to teach in Ukrainian in schools, preserving traditions and gaining minor rights and privileges. The positions of the Polish government, in this case, remained unchanged, with the exception of the insignificant tolerant statements of its individual representatives. Consequently, Polish politics did not achieve the desired results.

Keywords: Ukraine, Poland, sanation, pacification, UNDO, international relations, Eastern Galicia, assimilation, polonization.

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1. Introduction

The global transformation of all countries of the world to a new qualitative state and the type of civilization of the third millennium requires the gradual but steady integration of Ukraine into the system of international relations and world integration processes.

In the future, for Ukraine, its integration into Europe will be of great importance, because at the present stage our country enters the Western European socio-economic space with a broad front.

Poland is the most consistent and effective partner of Ukraine in its European integration aspirations among the post-socialist countries that are members of the European Union and have common borders, cultural and historical traditions with our country, as well as close geo-economic interests.

The last ten years in comparison with the centuries-old past of our nations have become the exclusive page of joint history, since the idea of good-neighborliness has become the main value that promotes the formation and development of contacts between our states during this period. The links between peoples in the political, economic and spiritual life of Ukraine and Poland have long historical traditions, but they have not always evolved in an atmosphere of peaceful coexistence and cooperation. In the common history of the two countries there are many “stumbling blocks”, the interpretation and evaluation of which greatly affects the process of building and deepening bilateral relations. In particular, one of such periods of controversial events between

the Ukrainian and Polish peoples was a difficult time between world wars, including the time of the Second Commonwealth. The constant struggle for spheres of influence, attempts to seize more space for the resettlement of their people, on the very front of Poland, which actively populated the Ukrainian lands with Poles, led to the disastrous consequences that took away the lives of many Poles and Ukrainians.

The first attempts to give an overall assessment of Ukrainian-Polish relations during 1918–1939 were carried out by their contemporaries, who, in the early 1930's, made the first steps in the process of consolidating Polish society and affirming the idea of the importance of strengthening friendly relations with other states, as well as the rise of the role of the Second Commonwealth in the structure of the international relations of Eastern and Central Europe. In particular, a striking example of this concept was presented in [1], which contains important information about the political parties that existed at that time in the Polish parliament.

Research presented in [2] has been recognized worldwide, which enabled to discover and make public the early works of Polish authors, to restore the masterpieces of the national Polish and Ukrainian culture. The researcher gave a new, objective and comprehensive interpretation of the history of Polish culture, showed its connections with the culture of other peoples. The actual result of the great scientific work was the fundamental monograph “The History of Polish Culture”, in which the author convincingly proved that the Polish Commonwealth made a significant contribution to the further scientific development of Europe.

During the 1940s and 1990s in Poland, as in Ukraine, the problem of interethnic relations was hardly covered as it was the subject of silence, ideological speculation or mere falsifications. Scientists only partially touched the issues related to the activities of the OUN and the CPWU (Communist Party of Western Ukraine).

In modern Ukraine and Poland, scholars, having the opportunity to freely study the historical issues of the relations between the Polish and Ukrainian peoples, have focused on the interaction of Ukraine and Poland in the international arena. Among the large number of modern works it is necessary to mention the research presented in [3], which, on the basis of the wide use of factual material, made an attempt to comprehensively analyze the relations between Ukrainians and Poles in the interwar years. A fundamental work remains published in [4] became the first in the Ukrainian modern historiography, the synthesis of the history of Poland, made on the basis of a deep elaboration of a large number of sources and interpretative achievements of foreign scientific literature. Also interesting was the new two-volume edition of “Poland and Ukraine in the thirties and forties of the XX century. Unknown documents from archives of special services” [5, 6]. The situation of the Ukrainian minority in Poland was studied in [7, 8]. The publication of documents and the publication of monographic works by Ukrainian historians [9, 10] greatly contributed to a better understanding of the factors shaping the Polish-Ukrainian relations. The culture of interethnic communication in Ukraine was analyzed in detail in [11] by the author as a scientist and as a representative of the Ukrainian government

The Institute of Ukrainian Studies of the National Academy of Sciences of Ukraine named after I. Kryp'yakevich, the Institute of History of Ukraine of the National Academy of Sciences of Ukraine, the Institute for Political and Ethnic Studies of the National Academy of Sciences of Ukraine, as well as other scientific centers of our country are actively working on the study of complex Ukrainian-Polish relations. Due to this research, in modern Ukrainian historiography, the historical truth about the everyday life of Ukrainians in Poland, Poles in Ukraine during the XX century, the rehabilitation of a number of prominent figures repressed by the Soviet totalitarian regime was found, becoming the basis for further resolving difficult issues and mutual claims in relations two states.

Of particular interest are Ukrainian-Polish ties in the years before the Second World War. Among the works devoted to this problem is the thorough monograph [12], in which a lot of documents were used and the Ukrainian-Polish relations in Eastern Galicia were analyzed objectively in the context of Polish national politics in the first five years after the end of the First World War. The researcher analyzed in detail the programs of Ukrainian parties and leading Ukrainian organizations on the national issue and their attitude to the Polish state, and also highlighted the main

aspects of Polish politics regarding the Ukrainian issue and the activities of major political parties and political groups through the prism of Polish-Ukrainian relations [13].

Despite the fact that the named works of both Ukrainian and Polish scholars are characterized by fragmentation and one-sidedness in coverage of the activities of Polish and Ukrainian organizations, their work became the foundation for further historical research.

2. Aim of research

The aim of the article is to analyze and distinguish periods in the policy of Polish governments in the national question in the territory of Western Ukraine on the basis of streamlining information about public and political processes in Ukraine and Poland, which resulted in active political actions of Ukrainian and Polish organizations and the emergence of a conflict between them, policy change of Polish government regarding the Ukrainian minority during 1918–1939.

3. Results

The dominant type of interethnic relations in the territory of Western Ukraine in the 20–30's of the twentieth century were the relations between the Ukrainians, who constituted the overwhelming majority of the local population, and the ethnic Poles, whom the state supported, and which provided the dominant position of Polish culture in Volyn and in Eastern Galicia. In relation to ethnic Ukrainians among Poles, the views dominated by the influence of the Polish national democrats prevailed, and therefore the peoples of Poland, which were subject to the political and cultural influence of Poles and their states, were also related to the Polish nation [3]. At the heart of this relationship was the statement about the cultural and civilizational backwardness of these peoples, as they did not reach the level of a “political nation,” and therefore subject to assimilation. Such a policy provided for a change in the national structure of the population of Eastern Galicia and Volyn. The policy of national assimilation through linguistic, educational and confessional policies envisaged the rapid polonization of Ukrainians, and the nature of interethnic relations can be defined by the intensification of the Polish-Ukrainian confrontation.

The economic policy of the Polish government on the Ukrainian lands also pursued the objective of inhibiting the development of these lands and turning them into an agrarian and raw material appendage for the Polish lands. The government officially divided Poland into two economic territories: Poland “A”, that is, the indigenous Polish lands, and Poland “B”, which consisted of captured Ukrainian and Belarusian lands. Thanks to cheap loans and public procurement, the industrial development of the “A” sector was stimulated, while on the Ukrainian territory there was a limitation on the granting of loans to industrial enterprises [5, p. 3].

The colonial policy promoted by the Polish government and the growing trend of the gradual economic downturn in Western Ukraine have become more and more a feature of economic catastrophe: about 25 % of the territory and 28 % of the population of the state accounted for Lviv, Stanislawsk, Ternopil and Volyn provinces, but only 16.6 % of industrial enterprises and less 10 % of workers.

Such artificial restraint of the economic and industrial development of Western Ukraine did not allow the liberation of a large number of able-bodied populations from the agricultural sector to work in factories, and thus mitigate the problems of the village, which was aggravated by agrarian overpopulation and the gradual landlessness of the peasants. The situation in agriculture on the Ukrainian lands was complicated by the fact that the Polish government in this region transferred the best land withdrawn as a result of the forced parceling of estates to the disposal of Polish sedentary who, in their turn, should promote the assimilation of the Ukrainian population and carry out punitive functions, if needed. In 1919–1929 about 80 thousand settlers received on Ukrainian lands about 600 thousand hectares of land [9, p. 51].

Polish government circles tried to oust the concept of “Ukrainian”. The Ukrainian population was officially called “Rusyns”, and the territory of Western Ukraine was called “Eastern Little Poland”. The beginning of the active polonization of these lands became the law of July 31, 1924, which proclaimed only Polish as the state language throughout Poland. The official Warsaw has taken the course to the complete elimination of the Ukrainian school.

Polish politics until 1923 focused on the need for the legal recognition of the Entente of real Eastern borders and control of Poland over Eastern Galicia. The main idea of the socio-political life of Ukrainians in Galicia in 1919-1926 was the opposition to the Polish occupation regime, the movement for the restoration of Ukrainian statehood, and the opposition to the assimilation policy of the official authority of the Second Polish Commonwealth.

A new stage in the policy affecting Ukrainians began immediately after the May coup in Poland and the establishment of the so-called sanation regime, the core of which was formed by Y. Pilsudsky's ideological comrades in 1926. When they came to power, they sought to "rehabilitate" the political climate and economic the situation in the state, which envisaged mitigation of relations in the field of national policy. The adherents of Y. Pilsudsky at such a critical moment could not fail to take into account the interests of the Ukrainian population that lived compactly in strategically important Southeastern regions of the state and formed the majority in these lands [10, p. 74].

Considering the Ukrainian issue as a purely internal Polish problem, they proposed a program of state assimilation as a guarantee of preserving their own nationality in minorities in order to form a conscious sense of belonging to statehood, which in the first place envisaged the education of loyal citizens of the state through methods of political, economic and cultural character.

From May 15, 1926, to March 17, 1930, when the Polish government 5 times headed the representative of the liberal wing of the rehabilitation of K. Bartel, the policy principles were formed in the national question, but the ways and methods for their implementation were not specified. At this time, the Ukrainian problem was mainly solved at the level of local authorities of voivodships.

A new wave of exacerbation of the situation took place in the early 1930's, due to the global economic crisis that began in 1929. From the Polish side, calls for a frontal offensive against all Ukrainian citizens began, and radical nationalist forces began to demand that the government take decisive measures in Ukrainian voivodships [3, p. 320]. In view of the explosion of the internal political situation, the so-called "pacification" of the Ukrainian peasants, was launched by the government.

Consequently, the events of 1930 showed the complete inability of the official ruling regime to resolve the Ukrainian issue. A vivid proof of this was the inconsistency in government actions, which was manifested in political attempts to resolve the problem, then in measures of a repressive nature. Under the pretext of fighting the sabotage of the Organization of the Ukrainian Nationalists, the army and police destroyed Ukrainian cultural and educational institutions, the beating of a civilian population took place, thousands of Ukrainians were brought to justice, including five deputies of the Sejm of the republic, which led to the disruption of the campaign against the Galician [14, p. 75].

The application of power by the principle of collective responsibility exacerbated the Polish-Ukrainian relations. The transformation of the negative attitude of Ukrainians towards the Polish state was resolved through an understanding with the most influential Galician party - the Ukrainian National-Democratic Union (UNDU) [15, p. 218]. Already in early 1931, several secret meetings of Polish government officials with influential politicians of the UNDU took place, in particular with M. Galushchinsky, who at that time served as the chairman of the Ukrainian Parliamentary Representation. Negotiations, which were conducted by the head of the non-Party bloc of cooperation with the government T. Golubko and the deputy of the Sejm Y. Yenjeyevich from the Polish side, did not bring the expected results.

In general, between 1926 and 1935, in the relations between the two peoples, two political forces opposed each other: the negativism of the Polish regime and cooperation with it. In such circumstances, the possibility of understanding with the Ukrainian political camp, which is loyal to the authorities, is almost disappearing. At the same time, on the side of Polish political circles there was a "probing" of the policy of cooperation between UNDU and the intergovernmental Polish authorities that won in the 1930s.

Since 1938, the intensified propaganda among the Ukrainian-speaking Hutsuls, Lemkos and the inhabitants of the Carpathians began with the idea that they are separate peoples and not part of the Ukrainian nation. Attempts were being made to develop the Lemko dialect in a separate language, and Lemkos were inclined to move from Greek Catholicism to Orthodoxy in order to

create a barrier between them and Galician Ukrainians. One of the varieties of this tactic was the efforts of the military to persuade the impoverished Ukrainian gentry, which was almost equal to the Ukrainian peasants, with the exception of its aristocratic titles, in that it is in no way similar to the peasantry [16, p. 185].

5. Discussion

The policy of Polish governments in the national question in the territory of Western Volyn can be divided into three periods:

1) 1921–1925 – characterized by the dominance of the doctrine of the Polish national-democratic forces, which meant only the Polish mono-cultural character of cultural life and the gradual assimilation of other peoples. Such policy was carried out by means of unification of the national boundaries. There was colonization in the form of military civilian sediment, the suppression of any manifestations of national liberation movements, administrative pressure in the political, cultural and religious spheres;

2) in 1926–1934, a change of the government's national policy is taking place; the government has declared the sanation regime, the official policy of assimilation of the national minorities in Poland. This program in the national question pursued the goal of replacing the policy of denationalization of national minorities by a federalist program of gradual state assimilation. This policy was meant to achieve, through certain actions, a loyal attitude of national minorities to the Polish state;

3) 1935–1939 in the policy of “sanation” there is a sharp turn to the right: a new concept was adopted – “the policy of strengthening the polishness of the Commonwealth”, that is, the policy of coercive national-state assimilation of national minorities. The significant increase in the weight of the military in the social and political life of Poland, the propaganda of the Polish pilgrims' organizations by the national forms of Polish totalitarianism provoked the popularization of nationalist ideas, and activated radical concepts for resolving the Ukrainian national issue. This period was marked by an increase in polonization pressure in virtually all spheres of life of national minorities.

Thus, an attempt to normalize the Ukrainian-Polish relations in the Second Commonwealth did not bring the expected results because it was not seen by the government as a positive solution to the problem. Having a negative influence on the lives of Ukrainians, these actions were remembered as the last wasted attempt to improve the situation on the eve of the Second World War. Since the occupation of a part of the Ukrainian territories, political circles in Poland have been pursuing a policy aimed at polonizing the country's social life and gradually destroying Ukrainian education and culture for the ethnographic superiority of the Poles against Ukrainians.

The struggle of the Ukrainian patriotic forces and the Polish national chauvinists did not allow Ukrainians to defend the sovereignty of their state, as this was not supported by the military-political situation in the region, the position of the Entente countries, as well as ethnic relations in the region.

Taking advantage of the moment, Poland was able to achieve a positive result for itself at the International Council of Ambassadors that took place in 1923 and began to implement traditional methods of exploitation of the local population in the Ukrainian lands. On the surface, this political line was based on the standards and canons of international law, but in reality contributed to the assimilation of Ukrainians, their colonization and polonization. Despite these unfavorable conditions, the Ukrainian intellectuals fought against the invaders, employing a variety of political and military-terrorist methods. Part of political parties, having lost hope of possible liberation, has changed its political programs in the pro-Soviet way. In general, Ukrainian parties and organizations in the early 1920's did not represent a united force, there were constant contradictions and misunderstandings between them.

Ukrainians in such a difficult situation were forced to adapt to the requirements of time, and therefore quite often changed the vector of activity toward the cultural and social direction. The intellectuals were fighting for the right to teach in Ukrainian in schools, preserving traditions and gaining minor rights and privileges. The positions of the Polish government, in this case, remained unchanged, with the exception of minor tolerant statements of its individual representatives.

In the national policy, the official definition was obtained by a program of state assimilation, which envisaged the transformation of Ukrainians into loyal citizens to the states. However, the Polish leadership did not develop a single concept for the implementation of this policy. Chauvinism, xenophobia and open hostility of Polish government structures sparked opposition from the local Ukrainian population, which managed to centralize all efforts, formed a kind of opposition to the colonial policy represented by UNDO representatives. The confrontation was unlikely for Ukrainians, therefore, the vector of patriotic struggle was shifted exclusively into the cultural and social direction, where there were still separate hopes of gaining certain privileges in education, culture, etc.

Consequently, Polish politics did not achieve the desired results. Through all its actions, the Ukrainian people showed that they can defend their own national state by their own national forces.

6. Conclusions

1. An attempt to normalize the Ukrainian-Polish relations in the Second Commonwealth did not bring the expected results, but instead had a negative influence on the lives of Ukrainians.
2. The military-political situation in the region, the position of the Entente countries, as well as ethnic relations in the region did not allow Ukrainians to defend the sovereignty of their state.
3. Taking advantage of the moment, Poland was able to achieve a positive result for itself at the International Council of Ambassadors that took place in 1923 and began to implement traditional methods of exploitation of the local population in the Ukrainian lands.
4. Ukrainians in such a difficult situation were forced to adapt to the requirements of time, and therefore quite often changed the vector of activity toward the cultural and social direction.
5. Through all their actions, the Ukrainian people showed that they can defend their own national state by their own national forces.

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COMPONENTS, CRITERIA, INDICATORS AND LEVELS OF PROFESSIONAL COMPETENCE FORMATION OF FUTURE FITNESS-TRAINERS AT HIGHER EDUCATIONAL INSTITUTIONS

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Abstract

The article considers the problem of estimating the professional competence of future fitness-trainers in higher educational institutions. There was determined the ambiguity of scientific views on the structure of the professional competence of a graduate, considered in the aspect of functional components of activity, management functions, psychic functions and psychological content of activity. There was elaborated the structure of professional competence of future fitness-trainers that includes: motivational, axiological, gnoseological, praxeological and personal components. There were separated the criteria of estimating of professional competence formation of future fitness-trainers: motivational-volitional, value-sense, cognitive-intellectual, operational-technological and socio-psychological ones. The correspondent indicators included: manifestations of volitional self-regulation and professional directionality of a person; striving for self-actualization; volume of knowledge from the cycle of professional subjects and research abilities; degree of didactic-motor, projecting-designing, control-analytic, organizational-regulative, motivational-communicative and marketing-commercial subcompetences; formation of empathy, communicative, organizational, leader abilities and conflict-resistance of a person. There were characterized the high, middle and low levels of the professional competence formation of future fitness-trainers in higher educational institutions.

Keywords: fitness-trainer, higher educational institution, professional competence, criterion, indicator.

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1. Introduction

In the last years the healthy life style gains importance in the population's value system of the world and especially in Europe. According to Karsten Hollasch, the partner of Deloitte Sports Business Group, Europe is the most market of fitness-services in the world. The European association of health and fitness EuropeActive, predicts the growth of the number of members of fitness-cubs up to 80 million persons till 2025 [1]. According to studies of Recruitment & Employment Confederation – REC, the specialty “fitness-trainer” is in the rating of first twenty high demanded specialties [2]. The increase of demand for qualified specialists needs the formation and development of the effective system of training staff, corresponding to modern requirements. The training system of future fitness-trainers in higher educational institutions has started and develops in European countries and USA [3, 4].

One of main components of professional training is its result and diagnostic instruments. Taking into account the strategy of the competence approach, learning results must be formulated in terms of competences [5].

For understanding results of the professional training of future fitness-trainers in higher educational institutions distinctly, it is necessary to understand the professional competence structure, specificity of fitness-trainer's activity, requirements, set by employers to such specialists in detail. It allows to separate criteria and levels for estimating education results.

It is well-known, that the key characteristic of the notion “professional competence” is an integrative quality of a personality of a future specialist that potentially provides executing his/her

professional duties and is a result of higher education [6]. We understand that a professional competence as a personal phenomenon has its structure.

The analysis of the scientific literature testifies that there are different approaches to classification of types and components of a professional competence. Thus, researchers separate special, social, personal and individual competence [7]; cognitive, praxeological and axiological components [8]; cognitive, functional, social and meta-components [9]. In the project «Tuning Educational Structures in Europe 2012 – TUNING» authors separate key general and subject-special competences [10].

Let's consider works of scientists, devoted to the specificity of the professional competence of specialists on physical culture and sport and especially fitness-trainers. In the structure of competences of a trainer in sports aerobics the authors separate motivational, personal, informational, operational and motor [11], and in one of competences of a future trainer in athletic gymnastics – motivational, cognitive, behavior, value-sense and emotional-volitional components [12]. Components of the professional competence of future teachers of physical culture for implementing healthy fitness technologies include: motivational-value, cognitive, activity ones of readiness [13]; components of the professional competence of future teachers of physical culture for training healthy gymnastics with girls of senior classes – motivational, cognitive and operational-activity ones of readiness [14]. As to specialists in fitness and recreation, the following structural components are described in literature: motivational-value; content; activity and creative components [15]. Generalizing all aforesaid, we can state, that most researchers name the operational (activity) component of the professional competence that reflects the functional aspect of the specialist's activity.

Pedagogical literature relates the gnostic, projective, organizational, designing, communicative and didactic functions to ones of a trainer in sports aerobics [11]; to ones of a gym coach – subject-professional, communicative, commercial, analytic-reflexive, image-presenting functions [16]. According to the authors, types of the fitness-trainer's professional activity include: psychological-pedagogical, gnostic, projecting, designing, communicative, organizational, physical training-health improving, scientific-research, diagnostic, motor and acmeological [17, 18].

The National Strength and Conditioning Association – NSCA of the USA accepted the following list of professional duties of a personal trainer (fitness-trainer):

1) uses an individual approach for estimating, motivating, teaching and training practicing persons, taking into account their needs, connected with changes of their health condition or physical readiness;

2) elaborates safe and effective programs of applying exercises, gives a first help if necessary and guides over persons for achieving their personal tasks.

At the same time it is noted, that personal trainer's duties include motivating persons for the regular motor activity [19].

So, generalizing the aforesaid, we can make a conclusion that there is no integral system theory as to the structure of the professional competence of future fitness-trainers and approaches to diagnosing training results of future fitness-trainers in higher educational institutions are not determined. It conditioned the topicality of the chosen problematics.

2. Aim of research

To substantiate components, criteria, indicators and formation levels of the professional competence of future fitness-trainers in higher educational institutions.

3. Materials and methods of research

The method of system analysis; analysis and generalization of scientific literature, comparison and confrontation were used for conducting the study.

4. Results of the research and discussion of the results

Taking into account theoretical works of scientists and own experience, we have elaborated the structure of the professional competence of future fitness-trainers, formed in higher educa-

tional institutions including: motivational, axiological, gnoseological, praxeological and personal components.

Let's note that the separated structure of the professional competence of future fitness-trainers differs from one from the scientific literature [15, 17], by both component composition and sense content.

The initial positions at structuring the professional competence of future fitness-trainers in higher educational institutions are the fact that each component in the totality characterizes a certain property, ability or talent of a person that is a direct or indirect base for the successful realization of professional functions.

Let's characterize these components with correspondent criteria, indicators of their estimation (**Table 1**).

Table 1

Components, criteria and indicators of the professional competence of future fitness-trainers

Components	Criteria	Indicators
Motivational	Motivational-volitional	Professional directionality of a person Formation of volitional self-regulation
Axiological	Value-sense	Striving of a person for self-actualization
Gnoseological	Cognitive-intellectual	Presence of the system of base and special knowledge on the cycle of professional and training subjects Formation of research abilities
Praxeological	Operational-technological	Formation of didactic-motor, projecting-designing, control-analytic, organizational-regulative, motivational-communicative and marketing-commercial subcompetences
Personal	Socio-psychological	Formation of empathy, communicative, organizational, leader abilities and conflict-resistance

The motivational component of the professional competence of future fitness-trainers is characterized by the formation of the personal professional directionality that influences the professional choice, professional self-determination, self-realization, stimulates the cognitive interest of students at studying, professional activity after its finish and is manifested in the integration of motivational constructions and volitional qualities of a specialist's personality. We have separated the motivational-volitional criterion for determining the formation level of the motivational component of the professional competence of future fitness-trainers. It determines a degree of the motivational-volitional criterion, manifested in striving for mastering professional knowledge and skills, working as a fitness-trainer and controlling own behavior in different situations, manage own actions, desires, states consciously.

The indicators of the motivational-volitional criterion are the professional directionality of a person and his/her volitional self-regulation (manifestation of persistence and self-control). Let's note that scientists left beyond attention the importance of volitional self-regulation at substantiating the motivational component of the fitness-trainer's professional competence.

At the same time many similar works underestimate the importance of the worldview aspect of a future specialist's personality [15, 17]. So, we separated the axiological component of the fitness-trainer's professional competence, based on values of self-actualization that determines the person's ability to self-determination, setting aims, achieving the professional "acme" and actualization of own potentials as means of life sense realization.

From our point of view, the formational of the axiological components of the future fitness-trainer's professional competence are estimated by the value-sense criterion. It allows to determine a maturity degree of a future fitness-trainer, provided by existential values, adequacy of self-estimation, creative attitude to reality and so on. The person's striving for self-actualization was related to the indicator of this criterion.

The gnoseological component of the professional competence of future fitness-trainers, formed in higher educational institutions, is characterized by the system of general and professional knowledge and formed academic abilities, especially research ones, which totality provides the high level of cognitive activity. This component is estimated by the cognitive-intellectual criterion. It reflects the level of theoretical readiness of students in professional subjects, based on the essential volume of fundamental natural and social knowledge and the development degree of research abilities that provide such rational operations as analysis, synthesis, generalization, differentiation, abstraction, concretization, comparison and analogue, establishment of casual correlations.

The cognitive-intellectual criterion is presented by two indicators: formation of base and special knowledge from the cycle of professional and practical disciplines and one of research abilities. In our work we paid attention to the necessity to estimate research abilities in the structure of the gnoseological component of the professional competence of future fitness-trainers.

The content of the praxeological component of the professional competence of future fitness-trainers is the complex of competences that reflect certain groups of specialists' professional functions. We related didactic-motor, projecting-designing, control-analytic, organizational-regulative, motivational-communicative and marketing-commercial subcompetences to them.

We related technical and physical readiness in aerobics, force fitness, aquaerobics, pilates and so on; the ability to teach clients motor actions of healthy fitness types and recreation; ability to correct mistakes and give insurance and help; ability to choose specific methods and means of the development (education) of physical qualities (correction of psychophysiological states), including by using an equipment according to tasks, age and physical condition of clients, to the content of the didactic-motor subcompetence of future fitness-trainers.

The projecting-designing subcompetence of future fitness-trainers includes their integral ability to transform desires and aim of a client in the system of concrete learning-training tasks; the ability to form fitness-programs in aerobics, aquaerobics, force fitness, mental fitness and so on, to develop animation programs with determining stages, aims, general and special tasks, means, equipment, rational parameters of the motor activity, forms of organization, methods of control, effectiveness criteria for persons of different age, sex, and physical condition; the ability to form prophylactic activities with physical exercises for persons with risk factors of diseases of the cardiovascular system, metabolism, locomotor system; ability to choose a musical accompaniment for complexes of physical exercises of different directionality if necessary.

The control-analytic subcompetence of future fitness-trainers provides their ability to realize the stage, operative and current analysis of the clients' health condition, their physical development, risk factors of diseases, functional state of the cardiovascular, respiratory systems of the organism, nervous-psyche status, physical readiness and working capacity of persons of different age and sex; ability to the correspondent interpretation of data, to revelation of technical and methodical mistakes.

The organizational-regulative subcompetence of future fitness-trainers characterizes their ability to realize the effective interaction between clients' group/client; ability to coordinate and to realize planned tasks at training, based on the optimal distribution of resources and regulation of load parameters; to provide the feedback with clients, based on means of verbal and non-verbal communication; to realize self-regulation of own psychophysiological condition. At the same time within this competence future fitness-trainers must be able to form individual financial documents of accounting and reporting; to check the usefulness of a special equipment and stock; give the first medical help at traumas and acute pathological states that may appear at fitness activities; to favor the positive emotional background at training by expressing artistry and pedagogical tact.

The motivational-communicative subcompetence of future fitness-trainers reflects one of important functions – the necessity to the purposeful formation of the clients' motivation to the regular physical activity and healthy life style. At the same time a fitness-trainer must give consultations of the wide circle of questions: safety of using the special equipment, rules of behavior in a club, principles of balanced and rational nutrition, methods of correction of harmful habits, self-control and so on. Within this subcompetence we accent just the future fitness-trainer's ability to manage the mo-

tivational process of clients as opposite to the communicative competence as the ability to effective cooperation between participants of communication, declared by scientists [12, 17].

The marketing-commercial subcompetence of future fitness-trainers provides their ability to realize a series of marketing strategies, namely: to reveal client's key needs, to plan and to develop fitness-services, based on the previous analysis of the consumption market; elaboration and realization of the system of motivating potential and real consumers of fitness-services, self-presentation and presentation of own fitness-services, presentation work with a client, ability to conduct a commercial conversation with a client as to offering group and personal fitness-services and associated healthy ones. Separating the marketing-commercial subcompetence, we widen the circle of functions, necessary for a future fitness-trainer.

The estimation criterion of the praxeological component of the professional competence of future fitness-trainers is the operational-technological one, used for determining a degree of the future fitness-trainer's ability to execute professional functions. The indicator of this criterion is a degree of mastering the didactic-motor, projecting-designing, control-analytic, organizational-regulative, motivational-communicative and marketing-commercial subcompetences.

The personal component of the professional competence of future fitness-trainers provides the formation of the complex of professionally important personal qualities of future fitness-trainers. The socio-psychological criterion that characterizes certain socio-psychological personal qualities, determining the fitness-trainer's successful activity, is used for estimating the personal component. It includes the following indicators: empathy, communicative, organizational, leader abilities and conflict-resistance. Let's note that we didn't meet indications on the study of such personal qualities as leader abilities and conflict-resistance in works of scientists about the personal component of the professional competence of future fitness-trainers.

Thus, the presented qualitative signs of formation levels of each component of the professional competence of future fitness-trainers allow us to determine the integral characteristics of the high, middle and low formation levels of the professional competence of future fitness-trainers in higher educational institutions.

The high formation level of the professional competence of future fitness-trainers in higher educational institutions is characterized by: the brightly expressed striving to master professional knowledge and skills; strong desire to work as a fitness-trainer and to improve the qualification; stable manifestation of the ability to self-control of the behavior; brightly expressed initiativeness and persistence in achieving set tasks; brightly expressed personal striving for self-actualization: formation of values of a mature person, high need in knowledge, high creativity level, brightly expressed adherence to principles, adequacy of self-estimation and high level of contact talents; deep, strong and system knowledge in the cycle of professional disciplines; brightly expressed ability to realize the full volume of research abilities; brightly expressed manifestation of the didactic-motor, projecting-designing, control-analytic, organizational-regulative, motivational-communicative and marketing-commercial subcompetences with the ability to realize independently the full volume of fitness-trainer's functions with creativity elements, without mistakes, with effective actions in learning and real situations; stable manifestations of empathy abilities; stable manifestations of organizational and communicative abilities; bright manifestation of leader abilities; demonstration of tolerance in a conflict, essential manifestations of conflict resistance.

The middle formation level of the professional competence of future fitness-trainers in higher educational institutions is characterized by: the moderate striving to master professional knowledge and skills; moderate desire to work as a fitness-trainer and to improve the qualification; situational manifestations of initiativeness and persistence in achieving set tasks; moderate manifestations of the personal striving for self-actualization: mastering values of a mature person, moderate need in knowledge, middle creativity level; stable adherence to principles; optimal self-estimation with a tendency to underestimation, moderate manifestation of contact talents; presence of knowledge in the cycle of professional disciplines; ability to realize most of research abilities independently, rest – with teacher's help; expressed manifestation of the didactic-motor, projecting-designing, control-analytic, organizational-regulative, motivational-communicative and marketing-commercial subcompetences with the ability to realize independently the full

volume of fitness-trainer's functions without creativity elements, with unessential mistakes, with effective actions in learning situations; situational manifestations of empathy; unstable manifestations of personal organizational and communicative leader abilities; moderate manifestations of conflict resistance.

The low formation level of the professional competence of future fitness-trainers in higher educational institutions is characterized by: the absence of striving to master professional knowledge and skills; absence of the desire to work as a fitness-trainer and to improve the qualification; weak manifestations of initiativeness and persistence in achieving set tasks; absence of manifestations of the personal striving for self-actualization: non-formed values of a mature person, absence of the need in knowledge, low creativity level; non-adherence to principles; low self-estimation, absence of a contact talents manifestation; fragmental knowledge in the cycle of professional disciplines; ability to realize research skills only with teacher's help; fragmental manifestation of the didactic-motor, projecting-designing, control-analytic, organizational-regulative, motivational-communicative and marketing-commercial subcompetences; ability to realize certain fitness-trainer's professional functions only with orienting on an example and teacher's help, with gross mistakes in learning and real situations; prevailing inability to empathy; absence of organizational and communicative leader abilities; low level of manifestations of conflict resistance.

5. Conclusions

1. The structure of professional competence of future fitness-trainers includes five components: motivational, axiological, gnoseological, praxeological and personal one. At that each component in the totality characterizes a certain personal property, ability or talent that is a direct or indirect fundament of the successful realization of professional functions.

2. The criteria and correspondent indicators of estimating formation of the professional competence of future fitness-trainers are: motivational-volitional (indicator – volitional self-regulation and professional directionality of a person), value-sense (indicator – striving for self-actualization), cognitive-intellectual (indicator – volume of knowledge from the cycle of professional subjects and research abilities), operational-technological (indicator – degree of didactic-motor, projecting-designing, control-analytic, organizational-regulative motivational-communicative and marketing-commercial subcompetences); and socio-psychological criterion (indicator – empathy, communicative, organizational, leader abilities and conflict-resistance).

3. There were separated the levels of the professional competence formation of future fitness-trainers: high, middle and low ones.

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METHODOLOGY OF TRAINING COORDINATING EXERCISES OF YOUNG SCHOOLCHILDREN WITH THE PSYCHIC DEVELOPMENT DELAY AT LESSONS OF PHYSICAL TRAINING

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Abstract

There has been elaborated the methodology of training coordinating exercises of young schoolchildren with the psychic development delay at lessons of physical culture. It consists of two blocks – psychic and physical ones. The psychic block includes the following processes and properties: visual and aural memory; image-logic and ocular-activity thinking. The physical one consists of the following coordinating qualities: the ability to evaluation and regulation of dynamic and temporal movement parameters, orientation in space; static and dynamic balance. Means, used at realizing the methodology, were divided in general and special ones. A peculiarity of special means was conditions of their realization, chosen in such a way to favor the development of coordinating abilities, psychic processes and properties most effectively. A component of the author methodology is a protocol of complex evaluation of the development level of coordinating abilities, psychic processes and properties of young schoolchildren with the psychic development delay. The forming study has proved the effectiveness of the experimental methodology. There were revealed statistically reliable changes in involuntary operational visual and aural memory, image-logic and visual-activity thinking. The ability to evaluation and regulation of dynamic and temporal movement parameters, static and dynamic balance improved.

Keywords: psychic development delay, coordinating exercises, methodology, young school age.

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1. Introduction

Children with the psychic development delay (PDD) are for today a special link that needs increased attention of specialists [1]. According to data, they are from 12 to 18 % of the general number of ones that enter the first form of a secondary school [2]. This fact testifies the acute necessity in searching for new approaches for solving this problem.

The analysis of literary sources testified that for today several aspects of correction of the schoolchildren's psychic development delay are studied. Especially, the methodology of physical activities for teenagers with PDD is scientifically grounded [3]. Organization-methodical bases of using moving games in physical education of young schoolchildren with PDD are studied [4]. Methods of correction of memory parameters in 6-year children with PDD were elaborated [5]. An integrative correcting-developing model of rehabilitation and adaptation of children with peculiarities of psychophysical development was created [6]. Age and individual psychosomatic peculiarities of young schoolchildren and teenagers as predictors of rational development are studied [7].

At the same time, elucidation of separate sides of the studied problem, complex researches with grounding the methodology of training coordinating exercises of young schoolchildren as an effective way of correction of the psychic development delay are absent.

2. Aim of research

To substantiate theoretically and to check experimentally the methodology of training coordinating exercises of young schoolchildren with the psychic development delay at lessons of physical culture.

3. Materials and methods of research

The following research methods were used for attaining this aim:

- *theoretical* – analysis of psychological-pedagogical, special literature and documentary sources, comparison, systematization of information (for arguing initial statements of the research, generalizing existent data, substantiating the essential content of node notions);

- *empirical* – testing of the development level of coordinating abilities and psychic processes and properties (for studying the influence of the elaborated methodology of young schoolchildren with PDD); theoretical modeling, pedagogical experiment (ascertaining, forming) – for developing the learning-methodological support of training coordinating exercises and revealing the effectiveness of the offered methodology;

- *statistical* – for processing empirical data, for checking the reliability of obtained results by methods of mathematical statistics.

The research was realized during 2012–2016 in four **stages**:

- *analytical-ascertaining* stage (2012–2013) provided the analysis of psychological-pedagogical, scientific methodological literature on the problem of the psychic development delay of young schoolchildren; determination of an object, subject, aim, tasks, programs of the research; accumulation and systematization of the empirical material;

- *searching* stage (2013–2014) – determination of the state of the development of coordinating abilities of psychic processes and properties in young schoolchildren with the psychic development delay and their interconnections; formation of structural components of the author methodology of training coordinating exercises of young schoolchildren with the psychic development delay at lessons of physical culture;

- *forming* stage (2014–2015) was in implementation of the author methodology of training coordinating exercises of young schoolchildren with the psychic development delay and verification of its effectiveness;

- *generalizing* stage (2015–2016) provided the analysis, generalization of data of results of probation of the methodology of training coordinating exercises of young schoolchildren with the psychic development delay at lessons of physical culture, making conclusions and predicting further prospects of the study.

The research-experimental work was realized on the base of Lutsk training-rehabilitation center (experimental group – 29 persons). The control group included 30 pupils.

3. Results

The study of preconditions of the methodology of training coordinating exercises of young schoolchildren with the psychic development delay revealed the problem of development of coordinating abilities, psychic processes and properties in modern young schoolchildren with PDD. In general it was established, that studied qualities, processes and properties are at the low development level. There was revealed the heterogeneity of groups by parameters: each age group included pupils with the higher development level and with the very low one.

Especially, the study of *abilities to spatial orientation* was realized using running to 5 numbered filled balls. It was established, that the statistically reliable difference between parameters of the ability to spatial orientation is absent between schoolchildren of all classes of control and experimental groups (**Table 1**).

Pupils from the second control class ran to numbered filled balls in 16.7 s, their coevals from the experimental group – in 16.8 s. Third-formers' results in the control group were 20.6 s, in experimental one – 21.2 s. Fourth-formers of the control group executed the test in 14.3 s, their coevals from the experimental group in 15.7 s.

Table 1

The state of coordinating abilities in young schoolchildren with the psychic development delay

Group	n	X	S	Sx	V %	± %	t (U)	P
Agility indices of second-formers								
Control	16	12.73	1.28	0.33	10.05	6.68	−1.014	>0.05
Experiment	10	13.58	2.45	0.82	18.04			
Agility indices of third-formers								
Control	7	13.56	1.68	0.69	12.39	2.21	−0.347	>0.05
Experiment	9	13.86	1.76	0.62	12.70			
Agility indices of fourth-formers								
Control	9	10.35	1.07	0.38	10.34	18.84	−2.773	<0.01
Experiment	11	12.3	2.01	0.64	16.34			
Spatial orientation indices of second-formers								
Control	15	16.65	2.65	0.71	15.92	−0.60	71 ^(U)	>0.05
Experiment	10	16.75	2.75	0.92	16.42			
Spatial orientation indices of third-formers								
Control	6	20.56	3.77	1.69	18.34	3.11	−0.281	>0.05
Experiment	8	21.2	4.74	1.79	22.36			
Spatial orientation indices of fourth-formers								
Control	9	14.31	2.15	0.76	15.02	9.36	45 ^(U)	>0.05
Experiment	10	15.65	5.65	1.88	36.10			
Static balance indices of second-formers								
Control	14	14.18	8.69	2.41	61.28	3.81	61.5 ^(U)	>0.05
Experiment	10	14.72	9.7	3.23	65.90			
Static balance indices of third-formers								
Control	6	11.32	21.52	9.62	190.11	54.77	27 ^(U)	>0.05
Experiment	8	5.12	4.07	1.54	79.49			
Static balance indices of fourth-formers								
Control	8	29.84	20.91	7.90	70.07	62.60	2.256	<0.05
Experiment	11	11.16	12.36	3.91	110.75			
Dynamic balance indices of second-formers								
Control	15	10.40	2.96	0.79	28.46	1.06	0.106	>0.05
Experiment	10	10.29	2.21	0.74	21.48			
Dynamic balance indices of third-formers								
Control	6	12.08	4.40	1.97	36.42	13.91	−0.621	>0.05
Experiment	8	13.76	5.72	2.16	41.57			
Dynamic balance indices of fourth-formers								
Control	9	8.89	3.11	1.10	34.98	8.10	0.510	>0.05
Experiment	9	8.17	2.87	1.01	35.13			

Note: (U) – U-Mann-Whitney criterion for comparing the difference between two independent samples with the distribution, distinct from the standard one; (N) – data group with the distribution, distinct from the standard one

The analysis of the variation coefficient indicates that all six studied groups cannot be called homogenous, according to results of spatial orientation testing. As far as the variation coefficient was within 15–36 %, it, in its turn, indicates the fact that the ability of schoolchildren's spatial orientation essentially differed by the development level within the mentioned age groups.

Evaluation of testing results of spatial orientation, according to standards, present in literature [8] testifies the very low development level of this ability in young children with PDD. Only

one of average results of all tested classes approached to standards. Especially, in fourth-formers from the control group the average result was 14.3 s that corresponds to the sufficient development level of first-formers. Such result testifies the essential lag of children with PDD from standards by the development level of spatial orientation.

At the same time the improvement of a series of coordinating qualities, psychic processes and properties with age in young schoolchildren with PDD was revealed. Taking into account this positive dynamics, one can state that coordinating qualities, psychic processes and properties of the studied contingent are developing.

The study of peculiarities of correlations between coordinating qualities, psychic processes and properties established that the more complicated coordinating quality, the more number of coordinating qualities, psychic processes and properties correlates with it. So, the development level of more number of qualities determines it [9].

The obtained results of the studies have proved our hypothesis about the close correlation between coordinating qualities, psychic processes and properties of children. It gave the reason to suppose that the development of coordinating qualities may favor the improvement of psychic processes and properties of children with PDD. The theoretical background of this statement is a scientific conception about the unity of the organism as an integral system, where all components are closely interconnected and mutually conditioned [10, 11].

So, the further studies were directed on elaboration and theoretical substantiation of the effectiveness of the methodology of training coordinating exercises of young schoolchildren with the psychic development delay at lessons of physical culture. The experimental methodology is based on the state learning program on physical training for secondary educational institutions (1–4 classes).

The author methodology of training coordinating exercises of young schoolchildren with the psychic development delay is directed on achieving the main aim – optimization of the physical and psychic development of young schoolchildren with PDD. Achieving this aim provides the solution of two interconnected tasks: the development of coordinating abilities; the development of psychic processes and properties.

The methodology structure can be conventionally divided in two blocks – psychic and physical ones. The first (psychic) block includes the following processes and properties: memory (visual and aural); (thinking) image-logic and ocular-activity. The physical (second) one consists of the following coordinating qualities: agility (the ability to evaluation and regulation of dynamic and temporal movement parameters, orientation in space); balance (static and dynamic). Both blocks are the single whole of the pedagogical process of children with PDD, their separation at realizing the experimental methodology is conventional.

Means, used at realizing the methodology, were divided in general and special ones. General means include: theoretical knowledge; general gymnastics; moving games and attractions; elements of light athletics; general developing exercises; elements of self-massage. Each group of the general means is divided in subgroups that, in their turn, consist of special means. The typical feature of special means is their execution conditions. They all are selected in such a way for favor the development of coordinating abilities, psychic properties and processes most effectively.

A component of the author methodology is criteria of complex evaluation of the development level of coordinating abilities, psychic processes and properties young schoolchildren with PDD. Psychic processes and properties are evaluated by the parameters: of visual and oral memory; image-logic and ocular-activity thinking. The evaluation of coordinating abilities is realized using indices of the dynamic and temporal moving parameters, spatial orientation, static and dynamic balance. The following tests are used for that: “Remember pictures”, “Remember words”, “Seasons”, “Cut out little figures”, “Shuttle running 3×10 m», «Running to 5 numbered balls”, “Bondarevsky’s methodology” and “Turns on a gymnastic bench”.

The evaluation is realized by quantitative (marks) and qualitative (verbal) indicators. The quantitative system of evaluation provides a 5-point scale for each quality. All quantitative testing results are added for the complex evaluation of the child development level.

The qualitative evaluation criteria are verbal evaluations such as “Well”, “Very well”, “Fairly well” and “Fantastically” that correspond to a certain quantitative mark. A teacher at lessons used only qualitative evaluation in the direct with schoolchildren. The quantitative evaluation is used for controlling the state of coordinating abilities, psychic properties and processes, their dynamics.

The study of the influence of the experimental methodology on coordinating abilities, psychic properties and processes of young schoolchildren with PDD established its higher effectiveness comparing with a conventional one (**Table 2**).

Table 2

Coordinating abilities of young schoolchildren with the psychic development delay under conditions of the experimental methodology

Experimental methodology											
Group	n	X	S	Sx	V %	± %	t (T)	P	± %	t (U)	P
Agility indices of second-formers											
Control	13	11.84	1.12	0.32	9.46	6.99	1.936	>0.05	1.44	0.326	>0.05
Experiment	8	12.01	1.08	0.41	8.99	11.56	2.220	<0.05			
Agility indices of third-formers											
Control	6	11.24	1.29	0.58	11.48	17.11	2.718	<0.05	5.16	0.740	>0.05
Experiment	9	11.82	1.50	0.53	12.69	14.72	2.609	<0.05			
Agility indices of fourth-formers											
Control	11	10.37	1.47	0.46	14.18	0.19	0.032	>0.05	6.27	42 ^(U)	>0.05
Experiment	12	11.02	1.11	0.33	10.07	10.41	2.246	<0.05			
Spatial orientation indices of second-formers											
Control	13	15.48	2.39	0.69	15.44	7.03	1.191	>0.05	3.20	0.580	>0.05
Experiment	8	15.00	1.21	0.46	8.07	10.45	3 ^(T)	<0.05			
Spatial orientation indices of third-formers											
Control	6	18.17	3.59	1.61	19.76	11.62	1.040	>0.05	2.73	0.300	>0.05
Experiment	9	18.68	1.56	0.55	8.35	11.89	2.217	<0.05			
Spatial orientation indices of fourth-formers											
Control	11	13.41	2.42	0.77	18.05	6.29	0.833	>0.05	1.94	48 ^(U)	>0.05
Experiment	12	13.15	1.76	0.53	13.38	15.97	13 ^(T)	<0.05			
Static balance indices of second-formers											
Control	13	17.81	10.14	2.93	56.93	25.60	35 ^(T)	>0.05	4.49	55 ^(U)	>0.05
Experiment	8	18.61	2.03	0.77	10.91	26.43	2.220	<0.05			
Static balance indices of third-formers											
Control	6	14.70	12.61	5.64	85.78	29.86	16 ^(T)	>0.05	31.37	28 ^(U)	>0.05
Experiment	9	11.19	5.35	1.89	47.81	118.55	2.383	<0.05			
Static balance indices of fourth-formers											
Control	11	28.63	17.41	5.51	60.81	-4.05	0.141	>0.05	25.92	1.25	>0.05
Experiment	12	21.21	7.11	2.14	33.52	90.05	2.790	<0.05			
Dynamic balance indices of second-formers											
Control	13	9.04	2.97	0.86	32.85	13.08	1.144	>0.05	7.63	0.678	>0.05
Experiment	8	8.35	1.45	0.55	17.37	18.85	2.312	<0.05			
Dynamic balance indices of third-formers											
Control	6	8.99	2.78	1.24	30.92	25.58	1.547	>0.05	12.72	25 ^(U)	>0.05
Experiment	9	10.30	1.98	0.70	19.22	25.15	2.444	<0.05			
Dynamic balance indices of fourth-formers											
Control	11	10.12	4.20	1.33	41.50	13.84	0.685	>0.05	20.65	44 ^(U)	>0.05
Experiment	12	8.03	1.15	0.35	14.32	1.71	0.204	>0.05			

Note: (T) – Wilcoxon T-criterion that helped to compare depending samples with the distribution, differed from the standard one

In experimental classes there were observed more essential, statistically reliable changes in coordinating abilities, psychic properties and processes of young schoolchildren with PDD. At the same time we can talk about the certain effectiveness of the conventional methodology, because some positive changes were revealed also in control classes.

Visual memory reliably improved in average in three experimental classes by 19 %, aural – by 55 %, image-logic thinking by 25 %, agility and distinctness of ocular-activity thinking by 24 % and 23 % respectively. Control classes didn't demonstrate any statistically reliable changes at the tendency to improving visual and aural memory by 7 % and 24 %, image-logic thinking by 14 %, speed and distinctness of ocular-activity thinking by 5 % and 12 %.

The average increments of agility in experimental classes were 12 %, spatial orientation ability – 13 %, static balance – 77 % and dynamic balance – 16 %. There were not observed any statistically reliable changes of coordinating qualities in control classes. There was revealed the general tendency to improving agility by 13 %, spatial orientation by 8 %, static balance by 16 and dynamic balance by 17 %.

The analysis of the dynamics of heterogeneity of groups by the variation coefficient also showed the effectiveness of the author methodology. During the research period variations of all studied parameters decreased in experimental groups, in control ones any reliable changes were not revealed. The variation of coordinating abilities decreased in experimental groups in average from 48 % to 18 %, and psychic properties and processes from 39 % to 14 %.

According to the developed protocol of the complex evaluation of coordinating abilities, psychic properties and processes of young schoolchildren with PDD there was revealed the improvement of their development under conditions of the experimental study. The development level improvement from the up-intermediate to advanced one was observed in second-formers, whereas the development level of the studied qualities was from the pre-intermediate to intermediate one in third-formers. The development level of the studied qualities of fourth-formers was intermediate with the positive dynamics of the total number of marks during the study (Table 3).

Table 3

The protocol of complex evaluation of the development level of coordinating abilities, psychic properties and processes of fourth-formers with PDD

complex evaluation of the development level of coordinating abilities, psychic properties and processes of fourth-formers with PDD							
N. S. of a studied person							
Parameter 1	2	3	Points 4	5	Mark/sum of points	Development level	
1 Visual memory, amount	5	6	7	8	9	4 (4)	≤ 11 low 12–22 pre- intermediate 23–33 intermediate 34–44 up- intermediate 45–55 advanced
2 Aural memory, amount	4	5	6	7	8	3 (2)	
3 Image-logic thinking, points	6	7	8	9	10	3 (2)	
4 Speed of ocular-activity thinking, min	8.0	7.0	6.0	5.0	4.0	4 (3)	
5 Distinctness of ocular- activity thinking, points	6	7	8	9	10	3 (2)	
6 Agility, s	13.5	12.4	11.3	10.2	9.1	3 (2)	
7 Spatial orientation, s	18.8	16.4	14.0	11.7	9.3	3 (2)	
8 Static balance (right), s	2	12	23	34	45	2 (1)	
9 Static balance (left), s	1	11	20	30	39	3 (2)	
10 Dynamic balance (right), s	14	12	10	7	5	3 (3)	
11 Dynamic balance (left), s	14	12	9	7	5	4 (3)	

Note: marks of the parameters of the experimental group at the research beginning are given in brackets

4. Discussion

This study testifies the firstly elaborated and substantiated effectiveness of the methodology of training coordinating exercises of young schoolchildren with the psychic development delay at

lessons of physical culture. The statistical analysis has proved its more effectiveness comparing with the conventional one, used at physical education of children with PDD.

This study widened and added the state learning program of physical culture for 2–4 form pupils with the psychic development delay. The typical feature of the author methodology is the fact that it favors the improvement of involuntary operational visual and aural memorizing, image-logic and ocular-activity thinking of young schoolchildren with PDD by developing coordinating abilities.

The study added data about the methodology of physical activities of pupils with PDD [3]. At the same time, from our point of view, the study of the contingent of young schoolchildren is more important in the practical aspect, because just this age is sensitive for the development of coordinating abilities, psychic properties and processes. Data about memory correction of 6-year children with PDD by means of physical education are also added [5]. Besides memory, our study includes image-logic and ocular-activity thinking. The more age diapason of children is involved in it.

The process of the studies revealed correlations between coordinating abilities and psychic properties and processes and confirmed the mutual determination of their development. It is coordinated with fundamental statements of the theory of functional systems that considers the organism as a single whole, which all phenomena and processes are mutually connected and determined [10].

At the same time with present studies of organization-methodical bases of using moving games in physical education of young schoolchildren with PDD [4], the results of these researches specify the structure of general and special means of training coordinating exercises of young schoolchildren with the psychic development delay [8]. The conducted study has a complex character and gives a possibility to understand age and individual peculiarities of children with PDD more detail.

The practical importance of the obtained results is in fact that the offered methodology of training coordinating exercises of young schoolchildren with the psychic development delay may be used in the process of learning-correcting work. Main statements may be used at methodical seminars, qualification improvement courses for teachers of physical training and ones of pedagogical HEIs.

The practical importance is proved by acts of introducing the research results, used as the author methodology of training coordinating exercises of young schoolchildren with the psychic development delay at lessons of physical culture in Lutsk learning-rehabilitative center (of 1.09.2016), at teaching theoretical and practical academic disciplines for students of the department of physical rehabilitation, and used by students at the specialized practice in Lutsk institute of human development of the University “Ukraine” (of 1.09.2016), at elaborating learning programs, at teaching academic disciplines “Defectology bases”, “Theory and methodology of physical education” by teachers and pedagogical practice of students of the Eastern European national University, named after Lesya Ukrainka (of 1.09.2016).

The conducted study doesn't pretend for the comprehensive solution of all aspects of the considered problem. We find the perspective of future studies in elaborating and substantiating of the effectiveness of the methodology of the development of coordinating abilities and psychic properties and processes of pupils of middle and senior forms with the psychic development delay.

5. Conclusions

1. The study has established that coordinating abilities and psychic properties and processes of young school children with the psychic development delay are at the low level.

2. There has been elaborated the methodology of training coordinating exercises of young schoolchildren with the psychic development delay at lessons of physical culture, directed at optimization of the psychic and physiological development.

3. The forming pedagogical experiment has proved the effectiveness of the experimental methodology of training coordinating exercises of young schoolchildren with the psychic development delay comparing with the conventional one.

4. The revealed positive dynamics of coordinating abilities and psychic properties and processes of young school children with the psychic development delay is a proof of the effectiveness of the experimental methodology of training coordinating exercises of young schoolchildren with the psychic development delay at lessons of physical culture.

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THE TRENDS OF CURRENT VOCATIONAL EDUCATION AND TRAINING REFORMS IN LUXEMBOURG: REVIEW AND ANALYSIS

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Abstract

The article deals with the theoretical analysis and grounding of current reform trends in the educational system of the Grand Duchy of Luxembourg, particularly in vocational education and training, as well as identifies the backgrounds for reforming the system of vocational education and training, and directions of activity for the implementation of the set tasks. In the course of the study, the problems faced by the Luxembourg vocational education and training were studied. They have both geopolitical and socio-economic characteristics and comprise: low level of pupils' performance in basic subjects; multilinguism; insufficient coherence of vocational training offers with the needs of the labor market within the country and in Europe; low rate of the labor force, that completes the full range of vocational education and training; insufficient development of vocational training in the tertiary level system.

Having examined the content of the well-established and drafted laws and acts, we have identified certain trends observed in the reform of the Luxembourg vocational education and training, namely: standardization of vocational education and training in accordance with the European educational standards; focusing on the secondary vocational education and training reforming; adoption of the best traditions of future skilled workers training from neighboring countries (Germany, Austria, Switzerland); international educational cooperation of Luxembourg that will provide the country with highly qualified workers.

Keywords: vocational education and training, higher education, the Grand Duchy of Luxembourg's education system, life-long learning, employment, reforms.

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1. Introduction

Nowadays vocational education and training (VET) is becoming not a crossboundary and transnational factor of the effective social development, a leading area for the formation of highly qualified and competitive workers capable of immediate respond to rapid changes in working conditions, growing volumes of technical science knowledge, globalization and informatization of all the spheres of social life, but also the main national and world priority.

In relation to developing countries, bilateral aid agencies, the World Bank and United Nations Educational, Scientific and Cultural Organization (UNESCO) advocate vocational education to reduce poverty, promote economic growth and increase competitiveness [1]. In a European context, it is seen as a major tool in the transformation of the European economy [2] and there are numerous examples of presumed effects in countries, regions and specific sectors of the economy [3].

Nevertheless, deep civilization changes and new socio-economic realities of the market economy require the rethinking and restructuring of the VET structure, as economies change, so too must vocational education and training [4]. Reference within our research to the small countries of Western Europe, such as Luxembourg, turns out to be very challenging. In recent years, it has made a significant progress not only in increasing of the gross national product, raising the quality of life and productive competence of the population, but also in reforming the educational system, specifically vocational education and training.

Another important thing is to highlight current trends in the national socioeconomic context while examining the development of VET, its appeal and qualitative results, the reforms and their influence on the economic development of Western European countries. Analysis of vocational training in various types of educational establishments in Luxembourg indicates that VET is characterized by a dual system of training that was extrapolated from the experience of Germany. Together with it, the differentiated VET of the country comprises the curriculum that performs certain vocational training functions characterized by the VET system of France. This suggests that borrowing of the better experience of future skilled workers' vocational training in European countries and its transformation into the national educational system of Luxembourg is a peculiar feature of this country, and deserves careful examination and analysis.

2. Aim of research

The research is intended to analyze and investigate theoretic backgrounds of current reform trends in the educational system of Luxembourg, particularly in VET; to distinguish the causes and consequences of its reforming; identify the principles and directions of activity for the implementation of the set tasks.

3. Reforming secondary vocational education and training of Luxembourg

The Grand Duchy of Luxembourg, a country of 2, 586 square kilometers, with a population of 582,972 (2016 census) and a trilingual education system moves toward increasing competitiveness in the global economic market. The problem of future skilled workers' vocational training is the need-of-the-hour being one of the main element of a new quality professional potential's building and that corresponds to the conceptual framework of the country's socio-economic development.

With the official start of the Luxembourg Presidency of the Council of the EU (2015), the period of enhanced European cooperation in VET was established. In June 2015, the responsible European ministers for vocational education and training met in Riga for the conference “Innovating for the Future of VET”. Together with representatives of the social partners and the European Commission they discussed the future challenges in the working world and defined deliverables on an EU level for the period 2015–2020 to boost employability and competitiveness [5].

It should be noted that the activity on creating a European educational area is coordinated and provided by various organizational structures. There is an estimated set of legislative and regulatory assets of foundation for reforming the system of higher education and VET in the European Union, and the corresponding sociopolitical and economic prerequisites for restructuring and improvement of the national educational systems of the EU member-states [6].

Several perspectives and objectives being achieved by EU member countries are reflected in Luxembourg’s system of VET, namely:

- finding an adequate balance between benefits and clarity of VET;
- developing closer ties with the business world and labor market being a prerequisite to efficiency and relevance to labor market needs;
- provide constant improvement of vocational skills within lifelong learning, irrespective of linguistic, cultural and socio-economic status.

It is also reflected in the National Qualifications Framework and the relevant references to this document, or in implemented reforms, for example the reform of vocational education and training in Luxembourg of 2008, that have been resulted in focusing on the learning outcomes and the introduction of a modular approach to the development of vocational training programs.

The VET reform of 2008 has created the legal framework for the adaptation of the VET system to the current realities of the society and the labor market.

It was mainly focused on:

- promotion of VET;
- improving the quality of VET and facilitating the access to lifelong learning;
- strengthening partnerships with the business world;
- the use of teaching and assessment methods based on the development of competences;
- replacement of learning courses by training units and modules focused on specific job situations;
- determination of training results by the acquired competencies and knowledge defined for each individual module;
- assessment and certification of apprenticeship accordingly learning results;
- training of teachers for a vocational school;
- the introduction of the notion “teachers for adults in certain fields of vocational activity”;
- improvement of cooperation between the state and social partners.

The reform of VET of 2008 (with amendments in 2014) was intended primarily to improve the quality of providing VET at secondary schools. The implementation of the main issues was carried out in two periods: first – 2010/11; second – 2013/14 [7].

Secondary VET in Luxembourg is based on a dual system that includes education at school, training in a private or state enterprise, as well as international cooperation with vocational enterprises of neighboring countries. In this context, an interesting fact illustrating Luxembourg as a country of educational and job mobility in Europe is a cross-border training for VET. It shows that education without borders, the most common in higher education sector, can also be applied in the system of secondary VET and carry out in different forms. Such forms of secondary vocational schools’ cooperation in providing dual training, for example, vocational training cooperation with neighboring countries (Germany, Austria), indicate the possibility of changing the geographical location (an enterprise is located in Luxembourg, and a vocational school – in Germany).

Still, most of the changes under the Reform of VET involved the provision for financial compensation to an employer in return to the services provided by the employer to the students during their practical training at the enterprise, as well as increasing number of basic vocational training programs in certain profile. Hence, the closer interaction between the state and business partners

within the Committee on VET of Luxembourg was directed at ensuring a joint development of training programs for future skilled workers who would be able to meet the needs of the national and world labor market [8].

Nevertheless, despite the close cooperation between Luxembourg and the Council of Europe on education matters and the ongoing efforts to reform the national educational sector, some urgent issues need to be reviewed. The key problem of Luxembourg's secondary education was identified in the European Semester Country Report 2016. It was reported that the performance of apprenticeship in basic skills (mathematics, reading and natural sciences) assessed within the Programme for International Student Assessment of the Organization for Economic Cooperation and Development (PISA) is lower than the EU average. It can be explained, mainly, by students' socioeconomic status and immigration background. It is shown not only by gained data on basic skills but also by statistics on dropout, whose amount is relatively high among immigrants.

Migration background however is one of the challenges to be tackled in the Luxembourgish education system. National intention to resolve the problem of quick adaption of immigrants to the well-being of Luxembourgish citizenship can be explained by the fact that non-natives are over-represented with relation to Luxembourg nationals. Besides, Luxembourg's blue-collar working-class are mostly represented by immigrants providing the country's economy with necessary and even deficit labor force.

Luxembourg's trilingual education system is another challenge for its highly diverse student population. Still, having analyzed the lingual aspect of the education system in Luxembourg, we should admit that the Luxembourg government has clearly set language priorities due to education levels. It means that Luxembourgish is spoken at home and at institutions of pre-school education, German is used for teaching children in primary schools. In general, secondary education, French is used for teaching mathematics and gradually extended to the other subjects. The dominant language in secondary vocational education is German, with French used in mathematics. So, entering higher education institutions, school leavers should not face any linguistic obstacles and can choose a higher degree program suited to their abilities, not to language fluency. However, the use of both, German and French, languages in secondary education could have caused the problem of low performance of apprenticeship in basic skills. Therefore, in 2015, the Council of Luxembourg adopted a bill on youth support provided various linguistic support measures, including language training of children between the ages of 1 and 3. This step has been fully appreciated by the society and demonstrated another aspect of the reform trends in the education sector.

National Framework of Qualifications

Another important step in reforming VET was the development and approval of the Luxembourg Qualifications Framework. The Luxembourg Qualifications Framework is intended to serve as a non-binding guidance framework for individuals, providers of education and training and for the employment market. It will enable individuals to rank their qualifications in relation to other qualifications, with a view to lifelong learning. A further element of the Luxembourg qualifications framework is its intention not only to apply to the formal system of qualifications but also to include non-formal qualifications [2].

It should be noted that the process of adoption of Luxembourg Qualifications Framework was not an easy one followed by numerous consultations and discussions within the country and the European Union. In 2005, after numerous consultations on the adoption of the European Qualifications Framework, the Grand Duchy of Luxembourg made a positive decision, although some misgivings were expressed. In Luxembourg's written request to the European Commission it was emphasized that a relatively unique national qualification framework was in a state of developing and needed time to be completed through consultations with EU member countries in order to correspond to their systems. In such a way, Luxembourg has demonstrated the importance of cooperation with European countries in educational issues and the national interest in this approach. This could be explained by three reasons:

- the ability to focus on competence as a result of learning activity that should be in line with the idea of adapting the national education system to European one and vocational training of a qualified staff of a certain profile;

- the approval of the qualification framework facilitates;
- the recognition of qualifications acquired in other EU member countries;
- recognition of the qualifications issued in other EU countries by Luxembourg's authorities

considering the situation in the national labor market and immigration trends.

Having adopted the Recommendations of the European Parliament and of the Council of 23 April 2008 on the establishment of the European Qualifications Framework for lifelong learning, Luxembourg's Ministry of Education and Vocational Training in cooperation with the Ministry of Higher Education and Research submitted the draft of the National Qualifications Framework for the Grand Duchy of Luxembourg (NQFL) for consideration and discussion by different organizations concerned. The document was developed in compliance with the existing national framework of qualifications and the qualifications frameworks of neighboring countries. In 2009, the Council of Government of Luxembourg took the draft of the National Qualifications Framework for consideration and then provided the consultations between ministries. In September 2010, the Council of Government adopted the final variant of the document and submitted it to the concerned group (social partners, representatives of chambers, representatives of secondary and vocational schools and the University of Luxembourg) [9].

We believe, developing of the National qualifications framework of Luxembourg, is a part of the initial stage of reform decisions taken to contribute to the further modernization of the educational sphere of the country. It is based on standards of knowledge, skill and competence and incorporates gained awards made for all kinds of learning. Besides, it corresponds to the European Qualifications Framework concerning lifelong education and training and links to other countries to ensure that qualifications frameworks are connected internationally.

Reforming higher education of Luxembourg

Higher education of the Grand Duchy of Luxembourg is governed by two laws: the Education Act of August 12, 2003, creating the University of Luxembourg [10]; Law of 19 June 2009, establishing a national system of higher education [11].

The aim of the Law of 12 August 2003 was to create the University of Luxembourg. It should be noted that, by 2003, there hadn't been any university in the Grand Duchy of Luxembourg. The Law of 19 June 2009 defined the framework of higher education and created the legal foundation for the development of new high degree programs. Besides it laid down the framework of legislation necessary for accrediting high degree programs organized by private or public establishments, whether Luxembourgish or otherwise, but established in the Grand Duchy. Higher education in the Grand Duchy is aligned with the structuring provided for in the Bologna Process, and hence comprises an initial short cycle followed by three university cycles [9].

Being a small country, the main reason for the lack of tertiary vocational education institutions, Luxembourg is trying to expand its cooperation with its neighboring countries attracting high-quality workforce for the national economy. For this reason, in May, 2015, the Benelux countries signed an agreement for mutual recognition of higher education diplomas [7]. The document was adopted by the Minister of Education for Children and Youth, the Minister of Labor and Employment, as well as public and private institutions of vocational education in the Greater Region. The main task of the agreement is to structure existing cross-border projects in identifying the general objectives of VET and labor mobility in the Greater Region. The targeted efforts of the agreement also include ongoing training of low-skilled persons and proposals for those who are seeking employment, mainly young people.

Thus, within the Great Region, the agreement on cooperation seeks to intensify labor market integration and mobility, especially among young people; reduce unemployment rate; recognize qualifications; intensify cooperation on cross-border VET; eliminate regulatory obstacles. However, the signed agreement regulates the most important issues of VET nationwide, namely:

- mutual recognition of diplomas and competencies;
- obtaining a diploma in two different countries;
- gaining of professional skills and abilities in the vocational training in other country;
- creating a network of relevant services such as ministries, employment centers and youth offices to promote vocational training and release the process of employment;
- strengthening support for cross-border workers.

In order to support students of higher education institutions in Luxembourg and promote transnational research mobility, the House of Representatives of Luxembourg adopted a regulation law of June 30, 2016, as an amendment to the Law of July 24, 2014 on state financial assistance to higher education graduates. Proposed amendments guarantee increasing grant financing – the mobility grant amounts to 2,450 Euro per year (instead of 2000 Euro earlier) and a social bursary amounts to 3800 Euro (instead of 3000 Euro earlier); flexibility of grant assistance in accordance with the indexation of wages in the country; some technical amendments regulating the procedure of grant financing by higher education institutions and the tools of avoiding simultaneous granting by different organizations. The new law of July 23, 2016 came into force on August 1, 2016, with the exception of the provisions related to the indexation of grant assistance that was applied on August 1, 2017 [12].

During the 2013–2014 academic year the reform of the state financial assistance in higher education for children of cross-border workers was implemented. The reform was carried out in the 2014–2015 academic year and came into force in August 2014 with the adoption of the law of July 24, 2014 “On State Financial Assistance for Higher Education”. According to the Law, the components of financial assistance for study at the University are loans and grants divided into different categories: major grants, mobility grants and social bursary. Unlike the previous legislation, the new system has a modular structure that implies an element of social selectivity. A significant increase in assistance for higher education in the 2013–2014 academic year was made by the European Court of Justice’s decision C–20/12 that required to grant children of cross-border workers with the social subsidies.

Active financial support of higher education and the development of scientific researches by the Government should be also admitted. State financial payments to the University of Luxembourg are constantly increasing. For example, state funding of the university has increased from 72 million Euros in 2009 to 101.6 Euros in 2012, in 2016 it amounted to 154.1 Euros. Consequently, the number of students increased from 4934 in 2009–2010 to 6172 in 2015–2016 [13].

At the same time, the lack of higher education institutions causes the constant increase of educational mobility guaranteeing Luxembourg citizenship high-quality vocational education abroad. Unfortunately, this tendency does not provide the country with corresponding education immigration.

4. Results of the research and discussion

The national plan for the smart, sustainable and inclusive growth 2020 published in 2017 is a National Reform Program of the Grand Duchy of Luxembourg that fully coincides with the European Strategy for Sustainable Growth, Europe 2020 identifying key policy issues and measures for promoting the economic growth and social inclusion within Europe. Reducing the dropout rate below 10 % of the total number of apprenticeships and increasing at least up to 66 % of the working population received tertiary or equivalent education between the ages of 30–34 years has been identified as national educational targets of Luxembourg to be realized by 2020 [13].

The Luxembourg Youth Guarantee Program (2014) is a significant example of Luxembourg’s efforts to improve the situation with early leavers. It offers individual programs for people aged 16–24 who are intended to continue education and find or improve his/her position in the labor market.

Having signed an agreement (Benelux agreement) on recognition of academic degrees, in 2015, qualifications endowed by Bachelor’s and Master’s degrees in Belgium, the Netherlands and Luxembourg are automatically recognized by the countries [6]. The main purpose of the document is to facilitate the mobility of students and labor force within the Benelux region.

It should be underlined that the number of students (mainly from immigrant families) at the secondary education level in Luxembourg enrolled in vocational programs is significantly higher than in other Western European countries (average percentage in Luxembourg is 60 %, Western European countries – 46 %). Still, the percentage of skilled workers completing the full cycle of vocational training is very low: 29 % of students enrolled in vocational programs (compared with the average 64 % in the Western countries).

To reduce the dropout rate in 2016 the Ministry of Education, Children and Youth of Luxembourg developed a new training program that is equivalent to the completion of a comprehensive school and foresees obtaining an admission diploma (Fran. Diplôme d'accès aux études supérieures) to continue education at higher education institutions. In Luxembourg, this diploma provides entering not only a university, but also getting a certain job in the public sector. Developed within the framework of lifelong learning, the educational project "Second Chance School" (Fran. École de la deuxième chance) started training of future students at the beginning of the 2016–2017 academic year. The target audience was people of age 20 who left school at least 2 years ago and had 12 months working experience (20 hours per week). Depending on the education level of the future graduate, the course lasted one or two years, completing with the compulsory final examination [14].

Having analyzed the recent data of statistics, we must admit, Luxembourg's plan to provide 66 % of the population aged 30 to 34 with the opportunity to get higher educational degree by 2020 is successfully fulfilling. The number of people acquired Diploma of Higher Education or higher vocational education has increased from 36 % in 2006 to over 50 % in 2015. Another way of implementing the national educational objectives is to expand the offer of state and private higher educational programs. In May 2015, three additional short-term professional programs directed to getting of the technical certificate (Eng. BTS technical certificate course) were accredited. As a result, the number of accredited higher vocational programs increased to 24 in the 2015–2016 academic years.

The role of universities should be also admitted in achieving the goals set by the National Reform Program of the Grand Duchy of Luxembourg. Having analyzed the education activity of the University of Luxembourg and private higher education institutions (BBI Wiltz School for Hospitality Business; Luxembourg Business; Luxembourg School of Business; Sacred Heart University; UBI Wiltz United Business Institutes) located in the country, we found out that they are intended to release the access of the population to the academic degree programs (Bachelor and Master programs) in order to raise the amount of citizenship obtained a tertiary degree or its equivalent. Thus, universities offer school leavers to entry academic or vocational training programs with a general or professional maturity certificate (Fran. diplôme de fin d'études secondaires; certificat de capacité professionnelle) without setting priorities. In addition, non-native students can be enrolled at higher education institutions with a General Certificate of Secondary Education issued by a foreign school equivalent to a national maturity certificate. This fact demonstrates the intention of Luxembourg's higher education institutions to increase the level of student mobility facilitating access to academic or vocational programs, thereby expanding educational opportunities for themselves.

Besides, applying for a master's degree program in a particular specialty, it is not necessary to acquire a lower academic degree in the same profile. Students should only obtain a bachelor's diploma or a specialized diploma of higher education. For retraining in further studying at the desired master's degree program, higher institutions offer an introductory year for Master Curriculum to further students' academic balancing.

Another peculiarity of studying at the Master's program at Luxembourgish higher education institutions is the necessity of having work experience indicated in the diploma given by entrance, and in some cases, the current workplace. It indicates the higher institutions' implementation of one of the most important national task to raise the education level of the country's labor force. Universities, in their turn, create flexible academic timetable, introducing weekend (Weekend MBA Format) or evening classes. Therefore, we can say that Luxembourg has finally determined the priority directions of the development of national VET in which education institutions of the country's secondary and higher educational levels are actively involved.

Understanding the importance of highly qualified workforce's training that secures the country with the competitiveness and innovation, facilitates the regulatory process in a changing economic market, Luxembourg is demonstrating strong performance in realization of objectives necessary for its implementation within the VET system. We are convinced that Luxembourg's experience in reforming the VET is comprehensive and prosperous and can be successfully used by other countries.

5. Conclusions

1. It is revealed that Luxembourg's vocational education faces problems that possess geopolitical and socioeconomic features and require urgent solutions. The issues referred to secondary VET can be defined as the low level of academic performance of apprenticeship on basic subjects; insufficient coherence of vocational training offers with the needs of the national and European labor market; a low rate of workforce completing a full cycle of VET. The system of tertiary level of VET is not sufficiently developed giving rise to the educational migration of Luxembourg's citizenship. Besides, multilingualism as a national identity causes the problem of poor-quality performance of pupils and students from immigrant families, whose great part represents the labor force of Luxembourg.

2. Having investigated the content of the laws, amendments to the laws and acts adopted over the last decades, we have identified some trends been observed in the reforming of Luxembourg's VET, namely:

- standardization in VET in accordance with European standards of VET by taking into account the recommendations of the European Council on Education;
- focusing on the reforming of secondary vocational education as the main supplier of labor force and the basic component of VET on tertiary level of education system in order to provide the country with highly qualified managerial staff;
- adoption of the best experience of future skilled workers training in neighboring countries (Germany, Austria, Switzerland) making good educational sense;
- international educational cooperation providing the country's economy with highly skilled personnel.

3. Consequently, Luxembourg's VET reforming is based on the European benchmark criteria and highly depends on the legal rules which regulate the economic system, such as the division of labor, competition, the concept of exchange, being extremely important in providing the maintained social and economic development.

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VALUE GAPS IN THE PLANETARY MATRIX OF THE WORLD COMMUNITY AS A LIMITROPHE OF WAR AND PEACE

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Abstract

The article describes the problem of spontaneous transformation of the planetary matrix of the social world, moving from the cell to the network structure, resulting not only in the changes of the world system of the planetary community, the shapes of national states are melting out gradually, the need for cosmopolitan world perception and thinking of the political elite arises, the managing processes come into the picture, hybrid planetary policy is formed, and finally, qualitatively new conflict forms and even hybrid wars appear. With the change in the planetary matrix structure, there are several fundamental changes in the life-plan of a planetary human being, since the fundamentally different segments of archetypes are activated in the world community's subconsciousness, the values-semantic substrates are mixed in the consciousness, and completely different logical schemes and algorithms of influence on a person are activated in the noosphere. At the same time, this means that in the sphere of national powers the emphasis of state policy, state regulation and public administration tends to shift from the territorial horizon into the plane of regulation of world planetary processes. This tendency also transfers the focus of their organizational efforts from the national and state levels to the political space of interstate and supra-state entities. The most intense points of relations between the actors of the modern integral process are the so-called limitrophes and frontiers.

Keywords: civilization, matrix, transformation, cell structure, network, fault, cosmopolitan consciousness, limitrophe, frontier, hybrid war.

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1. Introduction

Lately, the modern planetary world has been in the state of actual unsolemn permanent war. Today, it has a different degree of cruelty in more than forty locations on the planet. It acquires qualitatively new features, for example, becomes hybrid when the boundary between “us” and “them” actually disappears. The confrontation moves into the consciousness of the average person, which generates the fear and uncertainty of the entire peoples in the future on a mass scale.

Therefore, it became an acute practical and theoretical problem at the beginning of the XXI century. And it is related to the fact that this is not only about the lost lives of dozens, if not hundreds of thousands of people, and the huge loss of material wealth of the peoples, who have been building a practical basis for their own livelihoods for decades, but also about our theoretical and practical misunderstanding of what is happening with the consciousness of the planetary humanity, which, under the pressure of the generally accepted processes of globalization, informatization and significant increase in the capacity of international communication networks, must become more and more planetary, i. e., one that understands the common problems of the world community and is aimed at their positive solution.

Unfortunately, in practice, we are observing quite the opposite. The world begins intensive glocalization and small groups of carriers of anti-planetary ideas and religious fanatics are already beginning to enter massively the confrontation. What the outbreak of attacks on women in Europe by the so-called refugees from the Arab world is worth.

Therefore, the modern political science faces an acute social problem of explaining the causes and sources of increasing tension in the modern planetary world not so much in terms of the subjective factors behavior, i.e., by the reference to the mental difference of the aggressive action carriers, but using the theoretical analysis of the objective source of political tension growth, which constantly maintains the thirst for war in people and rulers, and delays peace and harmony between peoples for an indefinite period, most likely till the very end of the XXI century. From the outside it looks as if globalization leads to an increase in political tension between countries, and it serves as the basis for military conflicts that have generated even a qualitatively new form - a hybrid war. But everything in its time. Problems of globalization and globalization consciousness of the humanity have recently been studied in many scientific works. In this case it is enough to refer to the works of the classics of the humanities, Beck Ulrich, Beisheim Otto, *Giddens* Anthony, *Harvey Norman*, *Held Martin* etc. Let us look at the evaluation of the causes and consequences of the globalization made by Ulrich Beck in his famous works "What Is Globalization" (2001), "Power and Its Opponents in the Globalization Era. New World-Political Economy" (2007) [1, 2].

Based on the study of this problem, U. Beck came to the conclusion that the misunderstanding between the researchers who in the public debate defined the concept of "globalization" as the word that makes no sense, is over; others, by contrast, raise it to a new level of the fate of the world community, which has to solve all its problems at the expense of the collective cooperation of peoples among themselves.

Further, U. Beck points out that the discussion gradually moved to the practical plane. And according to his estimations, two methodological approaches were formed. The former comprehends and explores globalization in the spirit of growing interconnectedness, that is, in the spirit of an increasing number of interlacings, interdependencies, international flows, identities and social ties.

The second approach emphasizes the "abolition of space by time" due to new communication means. "People tend to conduct business internationally, work, love, marry, live, travel, consume, eat, educate children in an international spirit, exist in a generalized, nobody's space of television and the Internet; political identities and passions also no longer obey the commandments of the national monogamy of loyalty. Globalization is already conceived not as in the first approach - the growing interdependence, the continued existence of national-state public spaces, but as the internal globalization of these spaces themselves" [1, p. 9].

U. Beck in the preface to the work "The Power and Its Opponents in the Globalization Era. New World-Political Economy" notes that "... picking up these theses and at the same time making a significant step forward ... raises and develops the idea of globalization as a **historical transformation** (*highlighted by B. K.*)" [1, p. 9]. He then draws a conclusion: "... what so far played the leading role in the view of the world distinction between national and international is dissipated in the still vaguely defined power space of the worldwide internal policy" [1, p. 9]. The question arises from what our world moves and where it is moving?

Therefore, "the key problem of the present "procedural moment" is precisely the fact that many people (politicians, experts, scholars, journalists) keep on treating the current state as something temporary. They often perceive and treat it as something that is a "deviation from the norm" or simply a "transit state" to a fundamentally different "better future". Moreover, this is the opinion of even those, who have destroyed this world order that seemed unyielding a few years ago... " [3, p. 7].

What kind of inhuman power creates the attraction of national centers of political power to the voluntary implementation of a mutually agreed worldwide internal policy. The answer to this question is the purpose of this article.

2. Aim of research

Identify the reasons why the national centers of political power are forcing voluntarily to establish a mutually agreed global internal order.

3. Materials and methods

To carry out this research study we have looked into views of well-known political scientists and philosophers on the issues of interest to us. The toolkit used in this study includes custom methods for obtaining knowledge such as observation, analysis, synthesis, comparison, deduction and induction.

4. Result and discussion

The answer to the question, what this “historical transformation” process is, becomes possible if we substantiate the hypothesis of the existence of a planetary value-semantic matrix serving its social and political-organizational space, which includes the national power centers. In other words, the problem arises when the existing planetary value-semantic matrix does not provide for productive life activities and the development of the world community by means of functioning in the vertical space of universal, regional and ethnic-national values, distributed in a horizontal space on nine glocalised branches of the planetary civilization.

The planetary matrix, which has a value-semantic filling, as the nervous system serves the life activity of the human beings, so it serves the homeostasis and homeorhesis of the planetary social organism. At the same time, the semantic component in the self-regulation system of the socio-political development of a planetary whole enters into effect and provides for its innovative development, and the value, on the contrary, keeps the social system in a given range of possible transformation and does not let it leave those limits.

The ontological analysis brings us to the understanding that the modern planetary world is arranged in accordance with the principle of a cell structure, i. e., each national state is a capsule/monad with its values, the mentality of the population, and the willingness to protect its own existence when a neighbor makes an attempt to encroach on its national space. In this case the state independence and sovereignty are naturally the main signs of the state power and independence. This is supported by all components of the humanitarian sphere of the national state - from philosophy, religion, culture, propaganda and education to legal and judicial protection. So, a national statehood cell is based on the monad existence of an ethnic group and an average person in terms of value-semantic activity of the national society.

Thus, during the previous civilization development, the peoples, who were able to create a state, created an artificial, comfortable world for themselves, in which they separated themselves from all obscure, unacceptable in terms of their religion, philosophy, ethics and law.

Such a spatial limitation of value-semantic meaning in previous decades was forced and can be explained by the attributive properties of an average person.

This affects not only the existential but also the epistemological phenomenon of human presence in the construction of the world. The fact is that in natural-essential existence a person noumenally experiences an information load of one million bits every minute. However, a human being is able to master only 50 thousand bits of information per minute. Therefore, a person perceives reality selectively, according to the parameters of their needs and life orientations. Hence the objective need to encapsulate the living space of the peoples in previous eras arises. For this purpose the world community needs to master the model forms of the planetary life presentation, as, for example, politics, art, science or religion do it.

This is fundamentally possible, since in the modern era the picture began to change dramatically due to the emergence of a global information network Internet, which operates on satellite communications, uses computer channels, a new computer infrastructure of collective planetary thinking of the world community. It also creates an opportunity for dialogue on the planetary scale on a collective basis. Thus, not only the “world brain”, which H.Wells has dreamed of, matures, but also other elements of the new world order become mature: world power, world government, global civil society, world market, planetary identity, global knowledge, global education, world culture, etc.

The world becomes fluctuating despite the fact that the human existence is constituted phenomenally in a certain value-adaptive option. As S. Krymskyi notes, that in this case “the reality of the humane environment loses the features of objective spontaneity. What is called “sober reality” is in fact a compromise, a collage of utopia and life. Otherwise, as shown by E. Zamyatin in his

essay “Herbert Wells”, the reality would be not sober, but crazy. Apparently, if we once determine how the world’s elements control the human being, this day would be the last day of human existence. That is why our civilization builds its own world, acceptable for the spirit of the era, not always successful in its implementation, but necessarily an alternative to the challenges of the abyss” [4, p. 30].

Of course, the value component of the spiritual universe “summoned” such localized value-semantic fields to more complex segments, called the branches of civilization. Their functioning is provided for the basis of the geocultural values. Therefore, the planetary world today “broke down” into nine segments.

V. O. Nikytenko in the study of geocultural values in the context of contemporary world development gives the segmentation of the planetary value-semantic field [5]. The geocultural values are, according to this author’s definition, what the feelings of people force to recognize as prevailing over the existing, which should be sought, contemplated, treated with respect and recognition. They can be classified both vertically and horizontally. In the vertical section - this is their division into world, regional and ethnic-national geovalues. V. O. Nikytenko distributes them horizontally according to the nine branches of the civilization division of the planetary community, namely: American, European, Arabic-Islamic, Confucian, Orthodox-Slavic, Hindu-Indian, Japanese, Latin American and African regional sectors of geoculture [5].

Each state in the course of cultural and historical development has developed its own algorithm of existence and has a positive practice of political leadership of the society life. The core of the livelihood of the specific peoples, localized in the cell, is a major need that is protected by political power up to the use of military force. For example, according to V. O. Nikytenko, the focus of the American nation is the world domination, European – humanism, Arab-Islamic – religion, Chinese – the continuation of the genus, Orthodox-Slavic – the production of spirituality, Hindu-Indian – preservation of caste hierarchy, Japanese - work, Latin American – search for identity and affirmation of their own personality, African - solving food problems [5].

At the junction of the national states, the neighboring zones have emerged and function, for example, the Hungarians or the Poles in Ukraine. This means that each such structural unit or cell in the value-semantic matrix of the planet has its own filling and is a potential conflict zone in relation to its neighbors.

A special term appeared in the political science – *frontier* – “border”, territory on the border of two different societies. It is a transition zone, which is generally poorly integrated into the state structures and dynamic in nature, is characterized by high interactions between different, often hostile cultures.

Moreover, a line of value fracture, called limitrophe (from lat. limitrophus - boundary) is formed in the cultural-worldview space between the specific groups of countries. This geopolitical concept first appeared in the Ancient Rome. The concept of “civilizational interworlds” or limitrophe, has an important methodological significance in civilizational zoning and for the explanation of ethnic and interstate conflicts origins and even many numerical local small and large wars. This concept is related to the problems of the boundaries between civilizations and describes territories that potentially have an element of conflict (historical, ethnic, cultural, etc.) and helps to resolve such conflicts.

The civilizational approach is rather wide-spread in country study researches and the concept of “limitrophe” plays an important role in it, as it is related to such widely used country study concepts as “territory”, “state”, “interstate space”, “civilization inter-worlds”.

The study of the Great Limitrophe is closely intertwined with the problems of research in political geography and geopolitics. V. Tsymburskyi considers the belt of limitrophes adjacent to Russia as “a giant limitrophe, which, cutting Europe and Asia, separates Russia and gives it the features of a peculiar island within the continent”.

V. Tsymburskyi, for example, argues that “the large inter-civilization belt (Limitrophe), which extends from the Baltic through Eastern Europe and covers the Caucasus, post-Soviet Central Asia and the so-called old Tibet-Xinjiang-Mongolian Central Asia, ends in Korea.” He states

that this “belt of territories-streams separates Russia from power centers established on the platforms of other civilizations” [6].

In his opinion, the large limitrophe stretches across the continent from Poland and the Baltic to Pamir and Tian Shan, covering Eastern Europe with the Balkans, the Caucasus and the “new”, i. e. post-Soviet, Central Asia. From the cultural and geographic point of view, this belt, or the Great Limitrophe, is formed by the transitional peripheries of all civilizations of the Old World: Romano-Germanic (Western Europe), Arab-Iranian (Middle East), Russian, Chinese, and Indian. It finds its natural extension in the Turkic-Mongolian lands along the junction of the platforms of China and Russia, branches in the Tibet and completion in the Korean peninsula. V. Tsymburskyi believes that most likely it will be on the Great Limitrophe that the most important military-strategic and geoeconomic events of the early twenty-first century will take place [6].

S. Khatuntsev has a slightly different view on the problem of the Great Limitrophe. He describes the Great Limitrophe as a line stretching from Finland through the Baltic, Poland and Western Ukraine, further through Moldova and the Crimean mountains – to Transcaucasia and Anatolia. After the Caspian Sea, it includes parts of Turkmenistan, Afghanistan, Pakistan, Kashmir, Uighur to finally, through Mongolia, Manchuria and Primorsky Krai, it reaches the Kuril Ridge, the Aleutian Islands and Alaska [7].

Unlike S. Khatuntsev, V. Tsymburskyi includes in the Great Limitrophe a much larger part of Eastern Europe and the entire region of deserts and semi-deserts in the north of the Pamir, but does not include Afghanistan and Pakistan. In addition, he does not see any limitrophic spaces in the Pacific Ocean region.

But at the beginning of the XXI century, the picture began to change dramatically due to the globalization and informatization mechanisms. The cell structure of the planetary matrix transformed into the network. And when the morphological structure of the planet came into motion, not only the state structures shifted, but groups of countries began to change their borders and political imperatives. They are forced to build new political defense mechanisms. This can be seen from the example of such intergovernmental groups as the EU and BRIC.

Regional authorities, trying to protect the priorities of national development, are constantly in the state of tension with other members of the planetary political sphere. Constantly protecting their national values they cannot respond to the changes in the value-semantic matrix of the planet in a timely manner and in full. Consequently, contradictions are constantly accumulated and naturally grow into a crisis.

The process of self-destruction of the planetary world under the pressure of the planetary matrix transformation toward the network structure is so intense that, according to the forecasts of some analysts, the countries die as relatively well-established and independent structures. For example, at the Synergy Global Forum, Kiel Nordstrem, a professor at the Swedish School of Economics, gave a forecast that in 50 years instead of 218 countries there will be 600 cities [8]. He further notes that “in 25 years there will not be, for example, Austria, because Austria is already Vienna – and some small towns nearby. This will happen due to a change in the system of information perception, the development of transport and technology in general” [8].

Thus, with the change in the planetary matrix structure, there are several fundamental changes in the life-plan of a planetary human being, since the fundamentally different segments of archetypes are activated in the world community’s subconsciousness, the values-semantic substrates are mixed in the consciousness, and completely different logical schemes and algorithms of influence on a person are activated in the noosphere. At the same time, this means that in the sphere of national powers the emphasis of state policy, state regulation and public administration tends to shift from the territorial horizon into the plane of regulation of world planetary processes. This tendency also transfers the focus of their organizational efforts from the national and state levels to the political space of interstate and supra-state entities.

Such tectonic shift generates new forms of military conflicts and even wars. One of them is the hybrid war, informational war, cyberwar, etc. UN Secretary-General Antonio Guterres believes, for example, that the world has faced the need to establish a permissible framework for interstate cyberattacks. He made this announcement on February 16, 2018, during his speech at

the 54th Munich Security Conference, a “European Truth” correspondent report from Munich. He reminded that mutual strikes in cyberspace have become a reality. “The time has come to talk about the international legal framework for cyberwar,” UN Secretary General said [9]. He suggested starting a discussion on this issue at the UN General Assembly site. As it is known, there are international rules of armed conflicts with similar names. “Laws and customs of war” were enshrined in a number of international conventions more than 100 years ago, which since then have been modified many times. Their violation is an international crime.

The most intense points of relations between the actors of the modern integral process are the so-called limitrophes and frontiers. Therefore nowadays the humanity faces the challenge of hybrid wars, whether we like it or not. It is these wars that generate a new hybrid world, or to be more accurate, a hybrid world order. And we must respond adequately to this challenge, taking social planetary reality as it is. Since “there is nothing more constant in the world than inconstancy”, – J. Swift wrote [10, p. 167].

5. Conclusions

1. The globalization and informatization mechanisms change the existing value-semantic matrix of the life-structure of the planetary community from the cell-type to the network type, which entails a lot of morphological and functional consequences. Borders between national states disappear, and the value-semantic determinants of the life-style of the peoples acquire vague outlines.

2. The priorities of the national policy of each separate branch of civilization are gradually transforming into the solution the needs of the planetary nature.

3. We observe how the emphasis of state policy, state regulation and state administration from the territorial horizon shifts to the regulation of the world planetary processes.

4. The formation of a hybrid world immanently carries not only new forms of life-style and communications, but also hybrid forms of confrontation, for example, hybrid conflicts and even hybrid wars.

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