

DRIVERS OF MACROECONOMIC GROWTH IN A CREATIVE ECONOMY: INNOVATION POLICY AND HUMAN CAPITAL

^aLARYSA SHAULSKA, ^bANDRII KARPENKO, ^cOLHA DORONINA, ^dMARYNA NAUMOVA, ^eOLEKSANDR BILETSKYI

^aTaras Shevchenko National University of Kyiv, 64/13, Volodymyrska Str., 01601, Kyiv, Ukraine

^bNational University "Zaporizhzhia Polytechnic", 64, Zhukovsky Str., 69063, Zaporizhzhia, Ukraine

^{c,d}Vasyl' Stus Donetsk National University, 21, 600th Anniversary Str., 21021, Vinnytsia, Ukraine

^eThe National Defence University of Ukraine named after Ivan Cherniakhovskiy, 28, Vozdukhoflotsky Ave., 03049, Kyiv, Ukraine

email: ^ashaulska@knu.ua, ^bkarpenko.a.v2@gmail.com,

^co.doronina@donnu.edu.ua, ^dm.naumova@donnu.edu.ua,

^eabileckiy2015@ukr.net

Abstract: A model of multilevel innovation policy of creative economy in the context of capitalization of human potential is proposed, which is based on the following principles: social responsibility (of state, business, and individual), innovation, systematicity, and inclusion (increasing accessibility and stimulating increased participation of all citizens in society). It is substantiated that the state innovation policy promotes the growth of innovative activity of human potential and business entities, technology transfer, development of innovative entrepreneurship, stimulates priority innovations, etc. In order to confirm the hypothesis of the interaction of the level of innovation and digitalization of the country's economy, a cluster analysis of the EU and Ukraine was carried out. On the example of the three EU countries (Austria, France, Finland), which have the shortest Euclidean distance to the center when divided into clusters by indicators of digitalization of the economy, GDP and employment depend on the factors of the digital economy was assessed. Emphasis is placed on the decisive role of human capital in spreading the creative economy and ensuring macroeconomic growth on an innovative basis. It is concluded that, at the stage of the formation of human capital, preconditions should be created for the acquisition of innovative qualities by this capital. The author's vision of the system of strategic directions of human capital formation in innovative economic conditions is presented. It is substantiated that innovative personnel technologies acquire a special significance in the formation of an innovative economy at the stage of using human capital.

Keywords: Creative economy, Economic management, Human capital, Human potential, Innovation policy, Labor market.

1 Introduction

Modern technological changes and the high level of automation and robotization of production in the world testifies to the formation and development of the processes of creativity in various areas of socio-economic development. In a global post-industrial society, priorities such as education, research, improving the quality of life, introducing innovations and forming new intellectual activity are spreading. Talent, tolerance, knowledge of technology and unique human capital become the impetus for socio-economic development, based on a new paradigm of creative economy [18, p. 269]. Confirmation of the relevance of this area was the proclamation by the UN General Assembly in 2021 as the International Year of Creative Economy for Sustainable Development [8].

The modern economic paradigm differs from the previous ones in that human capital acquires a leading role, because in the conditions of global competition its quality determines the ability of a country to support the development of a creative economy. Today, human capital is the main value of society and a determining factor in macroeconomic growth, social progress and competitiveness.

At the same time, human capital is the main factor in the production of innovations, and the efficiency of its use is the key to the successful implementation of innovation policy as a driver of creative economy development. Thus, in modern conditions, the introduction of new approaches to economic management to address the problem of activating macroeconomic growth reserves through the introduction of a new type of innovation policy, the central links of which are human potential and human capital, becomes relevant.

The aim of the study is to substantiate the decisive role of innovation policy and human capital in ensuring macroeconomic growth, as well as to develop scientific and practical recommendations for the formation of a new type of innovation policy and identify priorities for the formation and use of human potential in creative economy.

2 Literature Review

The term "creative economy" was first introduced into scientific circulation in 2000 in the publication of the journal "Business Week" [28], and in 2001 John Howkins presented the conclusions about the justified coming of the post-information age in the study "The Creative Economy" [12]. His conclusions relate to the beginning of a new stage of the economy, for which resources, above all, are information and knowledge, and the driving force and main value – creativity. The scientist began to characterize the new nature and level of the relationship between creativity and economics, which creates extraordinary values, increases the importance of ideas, and intellectual resources become the main factor in production.

The development of the creative economy is based on the potential of the so-called creative class, whose intellectual and creative potential is an inexhaustible resource, with a growing impact on economic progress. The term "creative class" was first used by Richard Florida [6] to distinguish the category of people engaged in science and technology, architecture, design, education, art, music and the entertainment industry. One of their main functions is to create new ideas, technologies and new creative content. Representatives of the creative class are engaged in solving complex problems that require independence of opinion and a high level of education [6].

Creativity as an attribute of successful new economic development has been explored in the work of John Anthony Howkins, a member of the UN Creative Economy Advisory Board, and Richard Florida – an economist and sociologist, as well as Charles Landry, a World Bank expert.

John Howkins recognizes the peculiarity of the creative economy in the system of specific socio-economic relations between the economy itself and the creative approach to its development and improvement, which leads to the formation and development of a new creative sector of post-industrial economy [12]. Richard Florida defines the creative economy on the basis of professions, as it is based on the fact that the core of society is the creative class: the super-creative core and creative professionals who strive for comfortable (lifestyle) places [6]. Charles Landry notes that creativity (as a set of complex elements: cultural resources; creative thinking, production of new ideas; social initiatives and self-organization; organized process, cooperation mechanism; innovation infrastructure) is a determining factor in the formation of modern post-industrial civilization and a necessary attribute of successful development of new and super-new economies, as human abilities, talents, motivations, and attitudes to culture come to the fore [21].

Studies of the classics of economics and the founders of the theory of human capital [1, 19, 26] on the role of human potential and human capital in ensuring economic development, at the present stage move to the plane of study of individual cases of economic breakthroughs [27], in particular due to the intellectual component of human capital [24].

This study is a continuation of previous research by the authors, the results of which are related to the justification of the role of corporate culture in attracting talent to the organization and their preservation [17], the study of innovation and human potential in the system of competitiveness factors [14] in the modern labor market [14], the development of GDP growth directions through the development of labor markets and education [15].

3 Materials and Methods

3.1 Methods Used

To achieve a purpose of investigation such general scientific and special methods and techniques were used: theoretical analysis and synthesis, methods of grouping, clustering, modeling, comparison, economic-statistical, graphical representation, as well as methods of systematization and scientific generalization. The study is based on the use of information resources Eurostat and State Statistics Service of Ukraine, the World Economic Forum's data.

3.2 Creative Economy: Features and Manifestations

Creative economy is a continuation of the development of existing economic concepts, in particular, the knowledge economy, which is based on the materialization of its achievements – new ideas and plans. It optimizes economic, social, and cultural benefits based on favorable conditions for the development of digital technologies, innovation and digital economy and e-commerce, the formation of appropriate digital infrastructure and the interconnection of its elements to promote sustainable development [8].

The concept of creative economy lays in “the formation of modern interdisciplinary knowledge, formed on the basis of philosophical, economic, sociological, political and geographical research and is aimed at finding mechanisms for practical implementation as a key factor in sustainable development of the global economy” [3, p. 49].

Today, the creative economy is recognized as a model of a new reality, which in world practice has long been appreciated both nationally and within individual cities and regions. It has become the system that has allowed increasing competitiveness and forming a positive image of developed countries, consolidating leadership positions in the world and does not allow most other countries to stay away from these processes. The creative sector is currently the most progressive and dynamic in the global economy, and leadership in any sector of the economy is achieved through creativity. Unlimited creative human abilities have become the phenomenon of economic growth, i.e., intellectual assets of human potential. Intellectual assets represent a specific component of human potential as a set of cognitive, creative, emotional competencies of the economically active population, providing value creation and progressive dynamics of profitability and value [17, p. 59].

Based on knowledge and creativity, the creative economy stimulates creative decision-making, which provides solutions to potential problems using non-standard methods in a combination of sectors of culture and production, allows achieving a high degree of competitiveness and additional economic and social effects.

Rooting of a creative economy is a key component of economic growth, employment, trade, innovation and social cohesion in the world's most developed countries, confirming the rapid development of the creative sector in Australia, the US, Japan, South Korea, the EU (mostly the UK), and China. In particular, in the United Kingdom, for the first time at the level of government activities among the EU countries, the relevant policies were recognized and implemented and the organization of creative processes was initiated.

Features of the creative economy as a modern phenomenon of increasing the country's competitiveness are the following: the innovative nature of economic development, the generation of new knowledge (network and global nature) and ideas; breakthrough in the field of information and communication technologies; the growth rate of creative industries is higher than the world economy as a whole; the development of creative industries provides an increase in social welfare through the involvement of labor; increasing the role of technologies and discoveries in various areas of human capital; formation of new methods and ways of human capital management; creative thinking is the most important source of the latest, non-standard

solutions, which leads to the creation of new products and services, the promotion of ideas of environmental and sustainable development; the creative sector is recognized as an important factor in future global development and places high demands on the quality of human resources; attraction of practically unlimited resources of knowledge and creative talent of the person; a new level of interaction of market exchange participants [2, p. 35; 20, p. 69]. Accordingly, it can be noted that the main requirements for the formation of a creative economy are a high level of professional training of human resources, the ability to think creatively and generate new ideas, make original decisions, as well as readiness to learn new technologies.

The creative economy is a distinct sector of the modern economy, based on a high level of uncertainty on human intellectual activity and new technologies; it involves the use of a wide range of existing knowledge and the generation of new ones. It is recognized as “a new format of knowledge economy, which is the result of its evolutionary development as a result of which the share of value added in the product (service) increases due to the creative component and provides more proportional economic growth at the economies of different countries and regions” [3, p. 28]. That is, the creative economy is based on the production, consumption, and transformation of knowledge in the presence of investment in innovation.

In the light of growing global competition, the most important factors in the competitiveness of the national economy are already highly qualified and highly motivated staff who create intellectual property, determine the level of creativity of the economy. Creativization of economic development presupposes qualitatively new transformational changes in the system of corporate governance relations. There is a structuring of the entire economic system on an intellectual basis, where the determining role is played by the potential of the individual, which is “derived from the level of accessibility and quality of education, health, information and communication, economics, science, and culture” [3, p. 17-18]. That is, there is a growing attention to human potential, and especially its intellectual component, which can be realized in such a capacity as creativity. Accordingly, the role of intellectual capital and investment in education and training is increasing in the creative economy.

Taking into account the above and, accordingly, the purpose of this study, we will build a logical and meaningful scheme for macroeconomic growth in a creative economy (Figure 1).

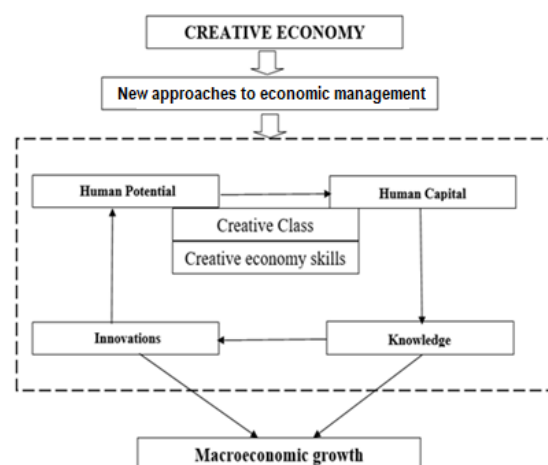


Figure 1 – Logical and meaningful scheme of macroeconomic growth in a creative economy

4 Results and Discussion

4.1 Priorities of New Innovation Policy in the Context of Human Resources Development

In the conditions of development of creative economy, which is based on knowledge and production of innovations and growth of added value due to intellectual work, there is an urgent need to form a new type of innovation policy in the context of human development. Innovation policy should become the basis for the development of intellectual assets of human potential, which will help increase the level of competitiveness of the country's economy. It is no coincidence that the locomotive of economic development today is recognized being based on science-intensive high-tech industries, which are complemented by creative industries. Therefore, namely the intellectual activity of human, based on cognitive, creative and emotional competencies becomes an integral feature of modern socio-economic development and a competitive economy, which must be taken into account in the new innovation policy.

The issue of forming innovation policy on the basis that will be relevant to the conditions of the creative economy is extremely important for Ukraine, whose economy requires the introduction of new management approaches. Low growth rates of the national economy and slow socio-economic shifts do not allow Ukraine to take a leading position in the world distribution today. At the same time, the experience of many countries of the world proves that economic development is provided by profound structural changes, which are based on the formation of an innovative model of the economy. Such achievements are the result of the use of active structural policy, which identifies priority effective areas of necessary innovation in the economy and ensures their implementation through the use of a set of government levers (government programs, direct public funding, foreign and private investment, tax and credit benefits, human development, etc.) and governing bodies.

Innovation policy is one of the areas of socio-economic policy of the state, which is based on the definition of ideas, objectives, goals, methods, tools, mechanisms and activities for their implementation and use. It is a set of forms and methods and a system of measures of state bodies for planning, organization, stimulation and control, aimed at creating interconnected mechanisms to intensify innovation processes and the development of innovation. The effectiveness of the state's innovation policy is determined by the ability to "ensure rapid and continuous movement of knowledge in all parts of the innovation chain from their generation to implementation in technological and organizational innovations, which are transformed into profits of high-tech companies, productive jobs and national income" [7, p. 505]. That is, the level of development of human potential and directly its intellectual assets will determine the speed and quality of generation, transmission, and transformation of knowledge.

The main features of innovative development in a creative economy are recognized as "the presence of state policy and legislation aimed at stimulating innovation processes; the predominance of the fifth technological mode and the transition to the sixth; unconditional priorities of state support science and education; the predominance of the intellectual nature of labor over industrial; integrated technologies; high-value labor" [14, p. 4]. It seems extremely important to emphasize the priority and dominance of intellectual labor in the creative economy, which can be realized in terms of decent wages, developed education and science, a high level of their integration with production. Because the innovative model of economic development is "a theoretical expression of innovative priorities, directions, structures, systems of motivation, strategies, mechanisms, etc., which are aimed at forming an innovative type of national economy" [33, p. 59], intellectual work and the development of intellectual assets of human potential in it should be an essential priority.

In Ukraine, it is important to develop such an innovation policy that would be consistent with the stated goal and based at least on the basic principles defined in the Law of Ukraine "On

Innovation" [22]. However, the declared goal and principles of innovation policy are not complete and relevant, are limited in implementation, and there is no categorical and normative definition of state innovation policy at all. Accordingly, such circumstances reflect the real state of innovative development of the domestic economy, when there is an understanding and its priority is declared, while a clear interpretation and real tools for implementing state innovation policy are missing.

Within the framework of innovation policy, the state must create conditions for the formation and use of human and scientific and technological potential of the country, determine priorities and support their development through a system of financial and credit and tax instruments, form organizational mechanisms of information and resource support of innovation, develop legislation and its implementation. That is, the state innovation policy should promote the growth of innovation activity of human potential and business entities, technology transfer, development of innovative entrepreneurship, etc.

Today, the state is a "universal player" in innovation development, because it is both a consumer of innovations and their producer. That is, the state, on the one hand, through its research institutes and organizations is an important producer of new knowledge, and, on the other hand, can influence the very processes of innovative (technological) development [11, p. 32]. However, these advantages are not reflected in the domestic practice of economic management.

Defining priorities and their consistent implementation, involving the maximum number of business entities and the population as carriers of intelligence in such activities, promoting the constant support of innovation activity is a strategically important aspect of further development. However, in Ukraine such approaches have not acquired the character of consistent purposeful activity in the direction of forming a high-quality innovation environment. The development of an innovative model of the economy in Ukraine is only at an early stage, as the share of the state in the structure of financing innovation remains very low. At the same time, the innovation potential of the private sector of the economy also needs the partner support of the state, because it is not fully used.

Understanding the importance of innovation has forced the world community to develop their own models of innovation policies for national economies, create a favorable environment for innovation, create a civilized competitive environment in the market of intellectual property, concentrate financial resources on priority areas of scientific and technological development.

In Ukraine, there is an attempt to implement certain elements of the policy of "technological breakthrough" and the policy of "market orientation", but there is no sequence of selected areas of development. However, the actions taken by the authorities are not systematic, there is often no monitoring and evaluation of the effectiveness of programs and activities.

Studies of modern innovative models of development show that they are all focused on high productivity of the economy to create and implement innovations, as they are based on close cooperation of educational, scientific and industrial sectors, higher practical orientation of education and science, active implementation of their results, local (specific) problems, etc. That is, each model involves the creation and development of elements of the innovation system and stimulate their productive interaction. Accordingly, human potential (in particular, its intellectual assets that can be transformed into capital) was recognized as an important basis for these innovative development models. Its special role was perceived at all levels of government, a set of measures was applied for their formation and optimal use, significant efforts were spent on its maximum activation.

In our opinion, the most desirable model of innovation policy for Ukraine could be one based on strong state and municipal support and close cooperation between industrial corporations and universities. However, there are some caveats. In particular,

the monopolization and concentration of a significant share of domestic assets at the disposal of a small group of owners is not able to ensure fierce competition today, and, accordingly, does not sufficiently stimulate to increase innovation activity in such an environment.

The effectiveness of innovation policies in many countries (Japan, USA, EU, India and China) proves the need for purposeful, systematic and well-founded public management of research and innovation, where the emergence and commercialization of knowledge. These types of innovative economies are based on the formation of the interaction of science, education and industry, as well as clearly distinguishes the developed basic science in the more "rich" countries that have a long practice of such activities. That is, these characteristics reflect the close relationship between economic innovation and human potential (intellectual assets, capital). Since a human is the bearer of knowledge, competencies (cognitive, creative, emotional), intelligence and is able to produce innovations, it is important to stimulate him to innovative activity. A special place should be given to creating conditions for the manifestation of human creativity and creativity.

Thus, the most important priority of Ukraine's innovation policy in a creative economy should be the development of intellectual assets of human potential, which will encourage the population to innovate, generate and transform knowledge into innovative products and technologies, ensure the commercialization of innovations. Such a balanced innovation policy should become a central part of the socio-economic policy of the state and will be able to increase the level of innovation activity, increase the production of innovations, the formation of a favorable institutional environment and innovation infrastructure. Modern innovation policy in Ukraine should be based on a combination of certain areas of active public policy, support for technology transfer centers, streamlining the structure of the economy and introducing effective mechanisms for cooperation of educational, scientific and business structures, consumers of innovation and state and local authorities.

The model of multilevel innovation policy of creative economy in the context of capitalization of human potential is offered, which is based on the following principles: social responsibility (state, business, personality), innovation (ability to renew, openness to the new), systematicity, integrity, structure, hierarchy, plurality, interdependence) and inclusion (increasing accessibility and stimulating increased participation of all citizens in society) (Figure 2).

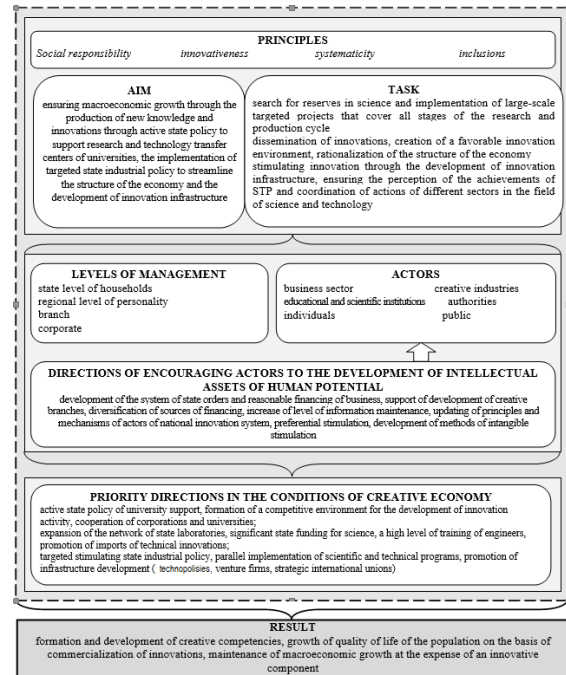


Figure 2 – Model of multilevel innovation policy of creative economy in the context of capitalization of human potential

These principles are defined as the main starting points that will determine the effectiveness of modern multi-level innovation policy. These fundamental principles will promote the coordinated interaction of all subsystems of the national innovation system, its actors (business sector, educational and scientific institutions, authorities, the public and individuals). The principle of social responsibility of the state, business and the individual is revealed by the following provisions: accountability, transparency, ethical conduct, compliance with all laws and regulations, and so on. The basis of innovation policy should be the ethical behavior of the actors of the national innovation system, which will promote trust and solidarity in their interaction [16].

The principle of innovation is based on the ability to update, openness to the new, focus on future consumers, search for unrealized opportunities, which involves the formation and development of innovation culture, opportunities and desire to finance scientific and technical developments. The principle of systematization reveals innovation policy as a complex dynamic system, the set of elements of which are interconnected and interdependent and that form a certain integrity, structure, hierarchy, plurality and unity. The principle of inclusion is based on increasing the level of accessibility and stimulating increased participation of all citizens in society in the processes of innovation [16].

In a creative economy, the goal of the state innovation policy of Ukraine should be an active state policy to support research and technology transfer centers of universities, the implementation of targeted state industrial policy to streamline the structure of the economy and develop innovation infrastructure. Certain areas of support for research of fundamental and applied nature should be combined with the involvement of private capital, which will provide a higher level of expertise, and the development of technology transfer centers will help accumulate business demand for development and promotion of intellectual activity. The level of interaction between the individual subsystems of the national innovation system will grow and stimulate the development of innovation infrastructure and the gradual rationalization of the structure of the economy.

The main tasks of the state innovation policy include: the search for reserves in science and the implementation of large-scale targeted projects that cover all stages of the research and

production cycle; dissemination of innovations, creation of a favorable innovation environment, rationalization of the structure of the economy; stimulating innovation through the development of innovation infrastructure, ensuring the perception of the achievements of STP and coordination of actions of different sectors in the field of science and technology.

Priority areas of multilevel innovation policy in a creative economy should be: active government policy to support universities, the formation of a competitive environment for the development of innovation, cooperation between corporations and universities; expansion of the network of state laboratories, significant state funding for science, high level of training of engineers, promotion of imports of technical innovations; targeted stimulating state industrial policy, parallel implementation of scientific and technical programs, promotion of infrastructure development (technopolises, venture firms, strategic international alliances).

Despite national differences in developed European countries that have recognized and adopted measures to stimulate innovation, mostly all achievements are based on institutional changes associated with the formation of structural elements and mechanisms for innovation policy: the creation of new administrative structures based on systemic nature of innovations; recognition at the governmental level of innovation as a vital factor in economic development and intensification of the relevant dialogue between the scientific community, industry and the public; the use of a new mechanism for forecasting and prioritizing "Foresight" for the formation of a national innovation strategy [20, p. 171]. The state, represented by state and local authorities, became the initiator and main source of funding for research and stimulation of innovation processes, which gradually began to be supplemented and replaced by a significant part of private capital. The expansion of private capital was ensured through the formation of a favorable business environment and favorable conditions for innovation.

Taking into account the general principles of public policy, it is important to implement them also within the framework of innovation, as they will contribute to the formation of a higher level of trust in society, increase the perception of initiatives for change and socio-economic development, mutual responsibility of all market participants, growth of innovation activity, etc. Accordingly, the acceleration of structural changes in the economy and its further innovative development is ensured by the state innovation policy, which primarily stimulates the interaction of all actors within the national innovation systems.

4.2 Clusterization of Countries According to Indicators of Innovative Development and Indicators of Digitalization of Economy

The study hypothesized that in a creative economy, on the one hand, innovation policy can be effective only in countries with a high level of digitalization of the economy. On the other hand, the effectiveness of innovation policy leads to an increase in the level of digitalization. In addition, according to the defined logic of the study, countries that provide a high level of creativity, human development and innovation are leaders in the level of competitiveness. Moreover, national innovation policies and human resources development programs in the context of globalization and European integration can be combined with common for a certain group of countries (cluster) priorities, measures, management tools. Therefore, it is expedient to build clusters of European Union countries on the indicators of innovative development and indicators of digitalization of the economy, as well as the assignment of Ukraine to the relevant clusters.

The method of multidimensional statistical analysis was chosen as the method of initial research – cluster analysis, which consists in dividing a set of objects into homogeneous groups or clusters that do not intersect. Clustering of the countries of the European Union and Ukraine was carried out by the method of k-averages on 4 indicators (indices), which characterize the innovative

development of the country and cover a total of 9 indicators for 2019.

The first indicator is the Global Creativity Index (X1), which generally characterizes creativity and the creative class in the regions and countries of the world by three key indicators of economic development: technology (investment in research and development, number of patents per capita), talent (share of adults with higher education and the workforce in the creative sector) and tolerance (attitudes towards immigrants, racial, ethnic and social minorities) [10].

The second indicator is the Human Development Index (HDI), which allows a comprehensive assessment of living standards in the country and measures the country's achievements in terms of health, education and actual income. HDI, in turn, includes several sub-indices; in this study, according to its focus, the following are taken into account:

- X2 - Life expectancy at birth (years);
- X3 - Expected years of schooling (years);
- X4 - Mean years of schooling (years);
- X5 - Gross national income (GNI) per capita (PPP \$).

The information source of data on these indicators is the Human Development Report 2019 [13].

The third indicator is the Global Innovation Index (X6), which ranks the world in terms of the effectiveness of their innovation, it is based on information on individual indicators, which are used to assess such effectiveness [28].

The fourth indicator is the Global Competitiveness Index (X7), which illustrates national competitiveness as the ability of a country and its institutions to ensure stable economic growth, which would be stable in the medium term and consists of 113 variables that detail the competitiveness of the world, at different levels of economic development. The set of variables consists of two-thirds of the results of a global survey of company executives (to cover a wide range of factors influencing the business climate in the countries studied) and one-third of publicly available sources (statistics and research conducted on a regular basis by international organizations) [29]. The information base for the clustering was sources [5, 27].

As a result of the cluster analysis, the group of EU countries and Ukraine is divided into 3 clusters (Table 1).

Table 1: Distribution of EU countries and Ukrainian by indicators of innovative development

Cluster 1	Cluster 2	Cluster 3
Bulgaria	Austria	Greece
Croatia	Belgium	Italy
Cyprus	Denmark	Malta
Czech Republic	Finland	Portugal
Estonia	France	Slovenia
Hungary	Germany	Spain
Latvia	Ireland	
Lithuania	Luxembourg	
Poland	Netherlands	
Romania	Sweden	
Slovakia	United Kingdom	
Ukraine		

The graph of national average values of indicators (Figure 3) showed their uneven distribution between clusters. Thus, the countries in cluster 1 (which is represented by most post-Soviet countries and which includes Ukraine) have the lowest values of all indicators, except Mean years of schooling (years), which indicates a low level of innovative development of these countries.

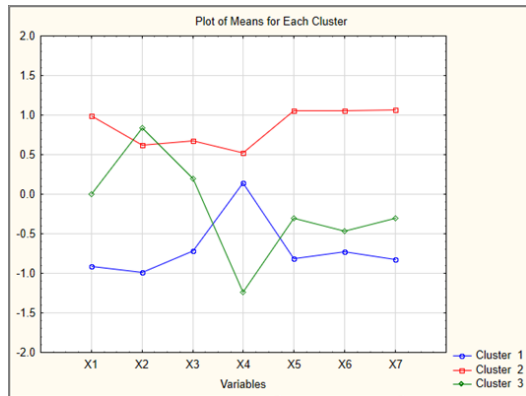


Figure 3 – Distribution of average values of indicators for each cluster of countries according to indicators of innovative development

Countries belonging to the second cluster (highly developed countries) are characterized by the highest level of all indicators, and only in terms of Life expectancy at birth are inferior to countries in cluster 3. Finally, countries in the third cluster are characterized by sharp fluctuations in values and their average position, among which the highest Life expectancy at birth, and the lowest Mean years of schooling.

The development of the creative economy is directly related to the rapid spread of digitalization of all spheres of society and economic processes. The labor market as an environment for the transformation of human potential into human capital is affected by the digitalization of the economy, which led to the expediency of determining in this study the impact of digitalization on the functioning of the labor market in the European Union. Clustering of 27 EU countries was carried out on 12 indicators using data [5, 32]:

- Employment in technology and knowledge-intensive sectors at the national level, agriculture, forestry and fishing; mining and quarrying, thousand (X1);
- Employment in technology and knowledge-intensive sectors at the national level, high-technology sectors (high-technology manufacturing and knowledge-intensive high-technology services), thousand (X2);
- Employment in technology and knowledge-intensive sectors at the national level, manufacturing, thousand (X3);
- Employment in technology and knowledge-intensive sectors at the national level, high and medium high-technology manufacturing, thousand (X4);
- Individuals regularly using the internet, frequency of internet access: once a week (including every day), percentage of individuals (X5);
- Individuals using the internet for doing an online course, percentage of individuals (X6);
- Level of internet access, percentage of households (X7);
- Enterprise provided training to their personnel to develop their ICT skills, all enterprises, without financial sector (10 persons employed or more), percentage of enterprises (X8);
- Persons with ICT education, employed persons, percentage (X9).
- Analyze big data internally from any data source, percentage of enterprises (X10);
- Use 3D printing, percentage of enterprises (X11);
- E-government activities of individuals via websites, percentage of individuals (X12).

The results of clustering are presented in Figure 4. The first cluster included 15 countries, the second cluster included 5 countries, and the last – 8 countries (Table 2).

Table 2: Distribution of EU countries by indicators of economic digitalization

Cluster 1	Cluster 2	Cluster 3
Bulgaria	Germany	Belgium
Czechia	Spain	Denmark
Estonia	France	Ireland
Greece	Italy	Luxembourg
Croatia	United Kingdom	Malta
Cyprus		Netherlands
Latvia		Finland
Lithuania		Sweden
Hungary		
Austria		
Poland		
Portugal		
Romania		
Slovenia		
Slovakia		

From the graph of averages for each cluster (Figure 4), one can see that the countries in the third cluster are characterized by the lowest level of most indicators of digitalization of the economy (X2, X5-X8, X10-X12).

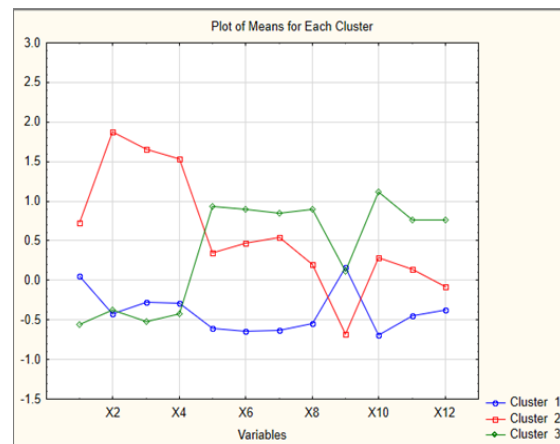


Figure 4 – Distribution of average values of indicators for each cluster of countries according to indicators of digitalization of the economy

The average indicators X1-X4, i.e., employment in technology and knowledge-intensive sectors at the national level, of the countries in the second cluster (Germany, Spain, France, Italy, United Kingdom), are higher than those of other countries, showing high level digitalization in the field of employment. But, at the same time, the indicator Persons with ICT education, employed persons has the lowest level compared to other clusters. Countries in the third cluster show high rates of digital economy development, except for X1-X4.

Thus, a comparative analysis of the two groups of clusters (Table 1 and Table 2) confirms that the countries belonging to cluster 2 (Table 1), namely Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Luxembourg, the Netherlands, Sweden and the United Kingdom, and have the highest rates of innovation development, respectively, are characterized by a high level of digitalization of the economy (clusters 2 and 3 in Table 2).

For further analysis, we select the three countries that were closest to the conditional center of the cluster (Table 2): Austria, France and Finland, as well as indicators of the European Union as a whole. At the next stage of the study, models of the dependence of employment and GDP of these countries on the level of indicators of digitalization of the economy were built. For these three countries, as well as for the EU as a whole, we will identify indicators of economic digitalization that have the greatest impact on such macroeconomic indicators as employment and gross domestic product. Using correlation-regression analysis, a number of regression equations were obtained (Table 3).

Table 3: The results of modeling the impact of indicators of digitalization of the economy on macroeconomic indicators

Country	Equation
EU	$Y = 114.8 + 0.2X_1 - 0.5X_2 - 0.8X_3$ Y — Employment to population ratio, 15+
Austria	$Y = 60.338 + 0.116X_1 - 0.157X_4$ Y — Employment to population ratio, 15+ $Y = 182790.6 + 1670.3X_1 - 1059.1X_2$ Y — GDP
France	$Y = 61.9 - 0.2X_1 + 0.4X_3 + 0.1X_6$ Y — Employment to population ratio, 15+ $Y = 1694553.3 - 6890.2X_1 + 9923.7X_2 + 6429.8X_7 + 19970.1X_8$ Y — GDP
Finland	$Y = 59.3 + 0.9X_1 - 0.9X_2 - 0.9X_4$ Y — Employment to population ratio, 15+ $Y = 32058 + 655X_1 - 746.3X_2 - 513.4X_4$ Y — GDP

The analysis of the obtained equations showed that the indicators of economic digitalization selected for the analysis have different effects on employment and GDP in different countries, which should be taken into account when formulating national innovation policies and labor market regulation programs in these countries. The study found that for most countries and the EU, the positive impact on employment and GDP has the part of the workforce that is a regular user of the Internet. In the context of the formation of human capital in a creative economy, this can also be seen as an additional way to form in the owners of labor those relevant competencies that are in demand by the economy and the labor market.

4.3 Strategic Tasks and Priority Directions of Formation and Use of Human Capital in the Conditions of Creative Economy

The study of the leading experience of economic management in the world shows that the high level of quality of human capital in the development of creative economy creates a basis for the dissemination and increase of knowledge, becoming the basis of macroeconomic growth and innovative development. At the same time, the study of the peculiarities of the management of the socio-economic sphere in Ukraine allows us to note that little attention is paid to human capital as a factor of innovative development. Thus, it is important to substantiate the priority areas of formation and use of human capital, which is one of the main resources for implementing a new type of innovation policy.

Developed human capital leads to increased competitiveness of the economy as a result of the implementation of innovative strategies. The accumulation of human capital of innovative type involves not only the active implementation of innovative ideas, but also the production of innovations by generating information and knowledge [15].

The strategic goal of managing the formation and use of human capital in a creative economy should be the acquisition of human capital innovative qualities and their implementation in the process of its use to spread innovation in all spheres of society, ensure a high level of economic competitiveness, socio-economic growth and personal development. capital.

As the creative economy develops, the priority of the most popular skills of employees changes. According to the results of the review of the reports of the World Economic Forum “The Future of Jobs” [32], it is possible to trace the evolution of requirements for a labor force capable of ensuring economic growth (Table 4).

Table 4: Evolution of priority staff skills in the context of creative economy development (according to the reports of the World Economic Forum) [32]

TOP-10 of most popular competencies		
2015	2020	2025
Comprehensive problem solving	Solving complex problems	Analytical thinking and innovation
		Active learning and

Cooperation with others	Critical thinking (↑)	learning strategies
People management	Creative abilities	Comprehensive problem solving (↓)
Critical thinking	People management (↓)	Critical thinking and analysis (↓)
Negotiations	Interaction with others	Creativity, originality and initiative
Quality control	Emotional intelligence	Leadership and social impact
Service orientation	Common sense and decision making	Use of technology, monitoring and control
Judgment and decision-making	Service orientation (↓)	Technology design and programming
Active listening	Negotiation skills (↓)	stress resistance and flexibility
Creativity	Cognitive flexibility	Ability to argue, solve problems and generate ideas

Thus, among the skills that will be in demand in 2025, in the first place, analytical thinking and innovation. Skills such as active learning, resilience, stress tolerance and flexibility are emerging for the first time. During the analyzed period, a significant increase in demand for creativity is expected (from 10th position in 2015 to 5th position in 2025).

Thus, at the stage of formation of human capital at all levels of its management (national, regional, corporate, individual) preconditions should be created for acquisition by human capital of such basic innovative qualities: system and reflective thinking, originality, ability to creative imitation, motivation to innovation and continuous personal development, ability to work in a team, multidisciplinary knowledge, skills and abilities, adaptability, etc. This is also confirmed by the fact that according to the World Economic Forum, by 2025 50% of all workers will need retraining, because the world's economies are experiencing a double shock - a pandemic and rapid automation. It is estimated that 85 million jobs over the next 5 years may replace machines. At the same time, 97 million new jobs can be created in the process of adapting the labor market to new realities [32].

We believe that in the context of the development of the creative economy, in the field of formation and use of human capital, the following strategic tasks of economic and social management are relevant.

At the stage of human capital formation:

1. Stimulating investment in human capital – together with the improvement of the economic situation in the country and the growth of investment potential of economic entities and individual carriers of human capital, motivation for professional development and training is important. In addition, it should be borne in mind that the development of an innovative economy and investment in human capital are in a dialectical relationship.
2. Formation of innovative competencies. Given that the innovative economy is changing the perception of the nature and role of human capital, the corresponding transformation is undergoing both its characteristics and integral features. One of them in modern conditions should be the presence of innovative competencies, which on the one hand contribute to the formation of innovations that have significant differences from existing products and consumer value, and on the other hand bring income to its owner in the conditions. At the same time, the employee's awareness of the expediency of acquiring these competencies and their use, as well as acceptance of responsibility, plays not the least role.

These tasks can be implemented through the following priority areas:

- Regulation of the labor market (ensuring effective employment, introduction of new forms of employment, concentration of human capital in innovation-oriented and creative sectors of the economy, improving the system of retraining the unemployed, stimulating them to look for work, increasing work motivation and motivation to realize human potential, etc.);
- Financial support for investment in human capital (formation of the mechanism of economic interest in investing in human capital, growth of income and living standards, introduction of a preferential system of taxation of human resources, development of tools to ensure the reliability of investment in human capital);
- Modernization of the education system (improving the quality and updating of educational content, ensuring informatization of education, continuity of education, expanding access to education, expanding freedom of choice of education and its content, transition from traditional to new educational outcomes, replacement of educational informatization model, developmental diversification) institutions, internationalization of education, formation of a new type of teacher).

At the stage of using human capital:

1. Stimulation of innovative activity. Since innovation, which is an integral feature of the creative economy, has significant differences from other types (reproductive, mental, creative, etc.), its stimulation should include various methods of influencing the behavior of a person involved in this activity and creating conditions for it. efficient use and further accumulation of human capital.
2. Promoting the reproduction and accumulation of innovative human capital, i.e., part of it that is focused and highly motivated to achieve specific goals in the production and dissemination of innovations. By its nature, this strategic direction is complex, as it includes a range of measures from maintaining the image of research and innovation to funding talent development programs.

The implementation of these tasks is carried out on the basis of the following priority areas:

- Creation of preconditions for effective attraction of human capital into the economy (promotion of employment in the specialty, provision of opportunities for professional development, development and implementation of productivity management programs, introduction of reinvestment mechanisms);
- Introduction of modern forms and systems of stimulation of innovative activity (choice of flexible systems of material stimulation of innovative activity, substantiation of effective forms of intangible stimulation of innovators, estimation of social and economic expediency of the introduced systems of stimulation of innovative activity);
- Formation of resource and methodological support for stimulating innovation (increasing the prestige of research and innovation, formation of special funds to encourage developers of new products, technologies, etc., substantiation of approaches to assess the effectiveness of innovation, monitoring the motivation of employees involved in innovation, etc.).

5 Conclusion

Ensuring macroeconomic growth in a creative economy should be based on the introduction of new approaches to economic management, the priorities of which are the formation of new innovation policies and strategic management of the formation and use of human capital. It is proved that the new innovation policy should be based on the cluster effect, which will ensure the network interconnection of all participants in innovation activities; its goal will be to increase the quality of life of the population, and as a consequence to ensure the preconditions for the formation of human capital in the creative economy.

The development and implementation of effective measures in each of these priorities will ensure that the country's human capital through accumulated quality knowledge, intellectual and high technology will be able to create a share of innovative and science-intensive products in GDP, competitive in world markets, which in turn will ensure macroeconomic growth.

Literature:

1. Becker, G.S. (1993). *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education* (3rd ed.). The University of Chicago Press, Chicago and London.
2. Chistyakova, A.S. (2016). Features of creative economy. *Scientific and technical information*, 1, 32–38. Available at: http://nbuv.gov.ua/UJRN/NTL_2016_1_8.
3. Davymuka, S.A. & Fedulova, L.I. (2017). *Creative sector of the economy: experience and directions of development: a monograph*. SI Dolishny Institute for Regional Studies of the National Academy of Sciences of Ukraine. Lviv.
4. Doronina, O. & Karpenko, A. (2019). Human potential and innovation as drivers of competitiveness in the new economy. *Roczniki Ekonomiczne Kujawsko-Pomorskiej Szkoły Wyższej w Bydgoszczy*, 12, 71–81. Available at: <http://bazekon.icm.edu.pl/bazekon/element/bwmeta1.element.ekon-element-000171589569>.
5. Eurostat. (2021). *Statistics*. Available at: <https://ec.europa.eu/eurostat>.
6. Florida, R. (2014). *The Rise of the Creative Class, Revisited*. NY, Basic Books.
7. Geets, V.M., Shinkaruk, I.V., & Artyomova, T.I. (2011). Structural changes and economic development of Ukraine: *monograph*. Edited by Dr. L.V. Shinkaruk. Kyiv: Inst. Of Economics and predicted, NAS of Ukraine.
8. General Assembly. (2019). *International Year of Creative Economy for Sustainable Development, 2021*. Seventy-fourth session. Second Committee. Agenda item 17. Macroeconomic policy questions. Available at: <https://undocs.org/en/A/C.2/74/L.16/Rev.1>.
9. Global Innovation Index. (2019). *Report 2019*. <https://www.globalinnovationindex.org/userfiles/file/reportpdf/gi-i-full-report-2019.pdf>.
10. Global Creativity Report. (2019). *Report by Cannes Lions*. Available at: <https://www.canneslions.com/2019-global-creativity-report>.
11. Griga, V. (2009). Features of the formation of national innovation systems. *Bulletin of the NAS of Ukraine*, 10, 22–35.
12. Howkins, J. (2001). *The Creative Economy. How people make money from ideas*. The Penguin Press.
13. Human Development Report. (2019). *Beyond income, beyond averages, beyond today: Inequalities in Human Development in the 21st Century*. Available at: <http://report2019.archive.s3-website-us-east-1.amazonaws.com/>.
14. Ivanov, V.V. (2004). National innovation system as an institutional basis of the economy of post-industrial society. *Innovations*, 5, 3–10.
15. Kalenyuk, I. Grishnova, O., Tsymbal, L., Djakona, A., Panchenko, E. (2020). Formation of intellectual corporate capital: methods and modern trends. *Bulletin of the National Academy of Sciences of the Republic of Kazakhstan*, 1, 182–191.
16. Karpenko, A., & Basenko, K. (2017). Highly Effective Corporate Culture as an Instrument of Talents' Attracting and Retaining. *Baltic Journal of Economic Studies*, 3(4), 101–106.
17. Karpenko, A.V. (2018). *Development of intellectual assets of human potential: theory and practice*. FOP V.V. Mokshanov, Zaporozhye.
18. Komelina, A.A. (2012). Scientific principles of formation of the mechanism of commercialization of innovative technologies. *Economy and region*, 6, 35–41. Available at: http://nbuv.gov.ua/UJRN/econrig_20126-9.
19. Kuznets, S. (1973). *Population, Capital and Growth: Selected Essays*. W.W. Norton & Company, New York.
20. Kyryzyuk, S.V. (2014). International and domestic trends in the creative economy. *Scientific Bulletin of Kherson State University. Economic Sciences Series*, 6(1), 68–72. Available at: http://www.ej.kherson.ua/journal/economic_06/17.pdf.
21. Landry, C. (2000). *The Creative City: A toolkit for urban innovators*. Comedia (Earthscan).

22. On innovation activity. (2002). *Law of Ukraine of 04.07.2002 No. 40-IV*. Available at: <http://zakon1.rada.gov.ua/laws/show/40-15>.
23. Onikienko, V.V. (2006). Innovation policy of the European Union and the CIS: problems and implementation practices. *Ukrainian Society*, 3, 170–183.
24. Shaulska, L., Doronina, O., Naumova, M., Honcharuk, N., Bondarevska, K., & Tomchuk, O. (2020). Cross-country clustering of labor and education markets in the system of strategic economic management. *Revista Electrónica de Investigación en Ciencias Económicas (REICE)*, 18(16).
25. Shaulska, L., Yakymova, N., & Krymova, M. (2020). Innovative employment in the structure of the modern labor market. *EJTS European Journal of Transformation Studies*, 8(1), 79-92.
26. Schultz, T. (1972). *Human Resources (Human Capital: Policy Issues and Research Opportunities)*. National Bureau of Economic Research, New York.
27. State Statistics Service of Ukraine. (2020). *Statistics 2020*. Available at: <http://www.ukrstat.gov.ua/>
28. The Creative Economy. (2000). *Business Week*. Special double issue: The 21st century corporation, 1–5.
29. The Global Competitiveness Report. (2019). *World Economic Forum*. Available at: http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport2019.pdf.
30. The Digital Economy and Society Index. (2020). *DESI*. Available at: <https://ec.europa.eu/digital-single-market/en/desi>.
31. Whalley, J. & Xiliang, Z. (2010). *The contribution of human capital to China's economic growth: NBER working paper*. National bureau of economic research, Cambridge.
32. World Economic Forum. (2021). *International Organization for Public-Private Cooperation*. Available at: <https://www.weforum.org/>.
33. Zakharchenko, V.I., Korsikova, N.M., & Merkulov, M.M. (2012). *Innovation management: theory and practice in terms of economic transformation: Textbook*. Center for Educational Literature, Kyiv.

Primary Paper Section: A

Secondary Paper Section: AH