



Yuriy Ivanov
D.Sc. (Economics), Professor,
National Academy of Sciences, Kharkiv, Ukraine
5 Freedom Square, Kharkiv, 61022, Ukraine
yuriy.ivanov.ua@gmail.com

UDC 334.72:330.524



Viktoriia Tyshchenko
PhD (Economics), Associate Professor,
Simon Kuznets Kharkiv National University of
Economics, Ukraine,
9 Lenin Ave, Kharkiv, 61202, Ukraine
vf_hneu@ukr.net

Public-private partnership potential in knowledge economy: regional aspect

Abstract. The article gives the authors' opinion about the determinants of knowledge-based economy development. A methodical approach to Ukrainian regions classification has been offered depending on the knowledge-based economy development level and public-private partnership potential. The differences between regions' development have been considered and their elements have been grouped on the basis of regions in four clusters. The points within each cluster, the removal of which will ensure a balance between stimulating the most promising areas and state support for peripheral areas, have been identified. It is the basis for overcoming the economic and social inequality. It is proved that public-private partnerships can become an institute of accelerating development in direction of knowledge economy through the division of the state (public sector) and the multiplier effect of business (private sector).

Keywords: Knowledge-Based Economy; Public-Private Partnership; Integral Index; Innovations; Education; Information Communication Technologies

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Іванов Ю. Б.

доктор економічних наук, професор, Заслужений економіст України, заступник директора з наукової роботи, Науково-дослідний центр індустріальних проблем розвитку НАН України, Харків, Україна

Тищенко В. Ф.

кандидат економічних наук, доцент, докторант, Харківський національний економічний університет імені Семена Кузнеця, Україна

Потенціал публічно-приватного партнерства в розвитку економіки знань: регіональний аспект

Анотація. У статті запропоновано методичний підхід до класифікації регіонів України залежно від рівня розвитку економіки знань та потенціалу публічно-приватного партнерства. Доведено, що публічно-приватне партнерство може стати інститутом прискореного розвитку в напрямі розбудови економіки знань завдяки поділу функцій держави (публічного сектору) і мультиплікативних ефектів від бізнесу (приватного сектору).

Ключові слова: економіка знань; публічно-приватне партнерство; інтегральний показник; інновації; освіта; інформаційно-комунікаційні технології.

Иванов Ю. Б.

доктор экономических наук, профессор, Заслуженный экономист Украины, заместитель директора по научной работе, Научно-исследовательский центр индустриальных проблем развития НАН Украины, Харьков, Украина

Тищенко В. Ф.

кандидат экономических наук, доцент, докторант, Харьковский национальный экономический университет имени Семена Кузнеця, Украина

Потенциал публично-частного партнерства в развитии экономики знаний: региональный аспект

Аннотация. В статье предложен методический подход к классификации регионов Украины в зависимости от уровня развития экономики знаний и потенциала публично-частного партнерства. Доказано, что публично-частное партнерство может стать институтом ускоренного развития в направлении развития экономики знаний благодаря разделению функций государства (публичного сектора) и мультипликативных эффектов от бизнеса (частного сектора).

Ключевые слова: экономика знаний; публично-частное партнерство; интегральный показатель; инновации; образование; информационно-коммуникационные технологии.

1. Introduction

Knowledge economy forming in Ukraine is accompanied by development of such important elements as: intellectual potential of society – the line «science – education – production»; information communication technologies in production – the line «ICT – innovations – production»; education and science computerization – the line «ICT – education – science». The state budget, especially in the last 10 years, has not enough money that would allow providing all these changes, which necessary for the development of the knowledge economy. Public-private partnership provides access to alternative sources of private capital and allows implementation of important and urgent projects, which, otherwise, would be impossible. The business and

state relationship system, which exists in Ukraine, stipulates necessity to form new partnership mechanisms based on the integration of state economy regulation principles directed at society development aims, tasks and priorities achievement, and business incentives. Potential of public-private partnership (PPPP), its power and opportunities stipulate consistency, depth and reasoning of society modernization in the direction of knowledge-based economy development (KED), efficiency of measured aimed at creating conditions for innovative and competitive business formation. Therefore, dynamic knowledge-based economy establishment and development combined with public-private partnership potential, is a highly topical issue for Ukraine and its regions, which explains the subject matter of the research.

2. Brief Literature Review

With account taken of the versatility of knowledge-based economy formation and development problems at any levels of the economy, certain issues have been studied by many foreign and Ukrainian scientists belonging to various schools and directions. Thus, knowledge-based economy basics, peculiarities and prerequisites of its advent have been elucidated in the works by such eminent foreign scientists as: D. Bell (2004) [1], G. Kahn (1967) [2], M. Castells (2000) [3], J. A. Schumpeter (1982) [4], who studied knowledge-based economy as one of the economic sectors. The issues of knowledge-based economy «outlines» formation have been studied by Ukrainian scholars, among which works by the following scholars are worth specifying: V. Semynozhenko [5] and A. Voronkova [6], which ground the principles of knowledge-based economy development at the national level; V. Heiets [7], whos works enhance the role of the knowledge-based economy as the grounds and the main element of «innovation economy»; L. Fedulova [8] who studies economics as a new technological level of economic management and assesses the perspectives of funding knowledge-based economy, suggests the possibility of state support in the sphere of science commercialization, which may help to accelerate economy development etc.

An important contribution to the study of the features of institutional environment and the implementation of public-private partnership made was by famous scientists, economists and experts in the sphere of public administration, B. Akitoby (2007) [9], D. Amunz (2005) [10], I. Zapatrina (2012) [11], A. Zeldner (2010) [12] and others. The researchers paid particular attention to disclosing the nature of this phenomenon, the use of models, forms and mechanisms of the most productive interaction between the authorities and business, as well as identifying strengths and weaknesses for each participant of cooperation, and analysis of foreign experience in order to adapt it to the realities of Ukrainian economy.

Acknowledging the scientific and practical significance of the works of these scientists, it should be noted that, despite some methodological diversity of the public-private partnership potential formation problems, and the account taken of the peculiarities of its impact on the knowledge-based economy development by the scientists belonging to different directions and schools, many aspects of the given issues remain underexplored and demand further development. Selective fragmentary approach to the outlined problem symbiosis is predominant, which makes their comprehensive solution impossible. Therefore, the necessity to improve the methodical basis of public-private partnership potential investigation gains topicality as a tool, which can ensure intensive knowledge-based economy development in our country.

3. Purpose

In the article is the development of the methodological approach to Ukrainian regions classification depending on the level of knowledge-based economy development (KED) and public-private partnership potential (PPPP) aimed at defining interregional proportions according to these factors.

4. The model. Regions Positioning in the Opportunities Plane

Hypothesis (1) is put forward in the process of achieving the aim of the work: about the concentration of knowledge-based economy and public-private partnership potential resources around certain powerful regional centres. In order to verify the hypothesis (1), we offer to use the method of economic processed matrix simulation, which will enable definition of the Ukrainian regions in the opportunity plane «KED – PPPP». The sequence of positioning is shown in Figure.1.

The following aspects have been reckoned on in the process of calculating the integrated indices:

- knowledge-based economy is characterized by the intensive development of three components: education, innovations and ICT (grounded in the work [13]);

- the factors, which characterize PPPP, have been combined into two groups: factors, which characterize the regional industrial potential level and factors, which characterize the regional finance and investment potential level (grounded in the work [14]).

Distribution of regions in the matrix quadrants «KED – PPPP». Practical approval of the suggested methodological approach to Ukrainian regions classification depending on KED and PPPP was conducted in development within 12 years (2003-4012).

There are the quantitative values of the KED and PPPP integrated indices in the Table. We have published their calculation techniques earlier [13, 14]. The yearly average estimates for integrated indices calculated in the aggregate for 25 regions bear testimony to the adverse economic situation, which, in general, characterizes the economic conditions of our country. For the last 12 years they haven't reached the medium index mark of 0,5 in the integrated index range. The classification of regions into quadrants of the matrix in the opportunity plane «KED – PPPP» is shown in Figure 2.

5. Results

The results of the calculations have revealed that the 4th quadrant of the matrix is the most numerous – it includes 60 percent of all regions – 15. The given data testify the economy development crisis in the abovementioned regions, their integrated indices values are below the overall medium index mark in Ukraine. These regions are characterized by: a low level of scientific and technological potential development, a minor contribution to GDP growth in Ukraine, absence of a well-organized urbanity living environment, lack of skilled labor force and jobs, high crime rate and unemployment level, overall scarcity of capital and feasible projects. In the modern conditions of knowledge-based economy development, they are subject to the structural crisis caused by the obsolescence of technical and engineering capacities, insufficient market positioning of production, decrease of investment prospects etc. These regions require implementation of such social development instrument as public-private partnership, particularly at the local level, aimed at the existing business communications structure

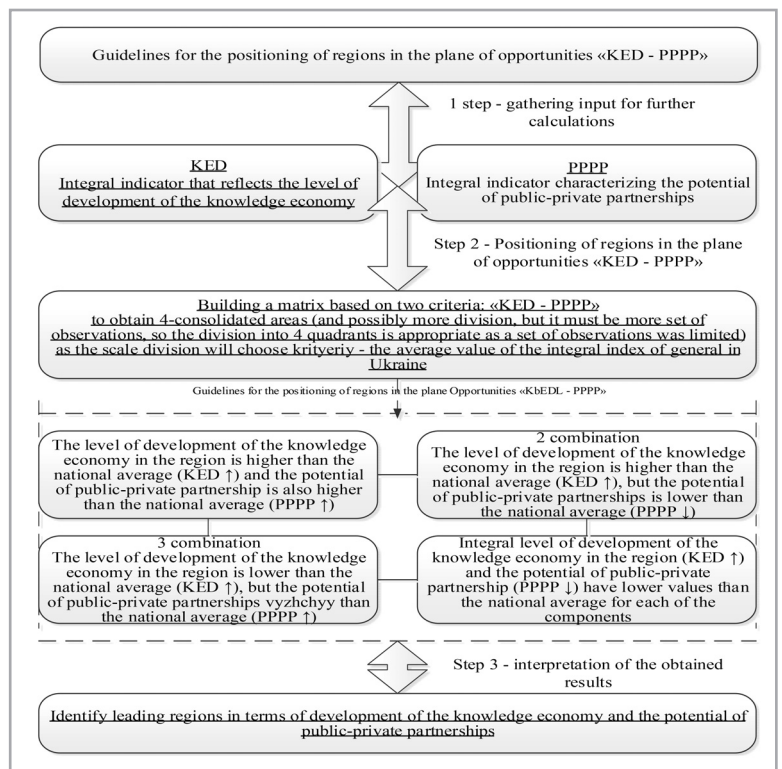
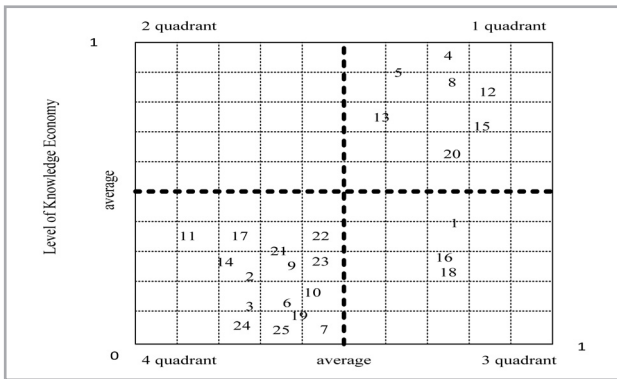


Fig. 1: The Sequence of Ukrainian Regions Positioning in the Opportunity Plane «KED – PPPP»

Source: Original Development



Note: The numbers at the figure are indicated by the region's serial numbers (see Tabl. 1)

Fig. 2: Ranking of Ukraine regions by the plane of capabilities
Source: Calculated by the Authors

restoration and elimination of regional differentiation according to the level of regional economic subsystems performance. For example, western regions of Ukraine, due to their favorable geographic location, possess a certain resource potential, but it is not fully employed because of the underdeveloped organization economic mechanisms and funding of the declared social economic growth regional strategies implementation. This results in the need to capitalize their resource potential and form additional development sources. One of the most effective methods is the method of solving these issues is the implementation of private investors' resources within the framework of PPP.

The representatives of the third quadrant in the matrix are only 3 objects (the AR of Crimea, Poltava and Sumy regions). These regions are similar as to their economic development, which is shown up in the following facts:

1) the component, which characterizes the investment and finance potential level of the regions has the maximum value of integrated indices (the AR of Crimea – lifpl (integral level of investment and financial potential) equals 0,27; Poltava region – lifpl is 0,36; Sumy region – lifpl is 0,36);

2) the minimum value of integrated indices is inherent to the innovation component of knowledge-based economy (the AR of Crimea – IC is 0,11; Poltava region – IC is 0,07). Thus, in order to enable transfer of these regions to the first quadrant of the matrix, particular attention should be paid to the innovation component of knowledge-based economy. The appropriate attention from the state aimed at developing the abovementioned components will enable Poltava region to transfer to the first quadrant of the matrix, moreover, in 2003-2004, 2007 and 2011 it was one of the leading regions. However, in order to come to a whole new level in the given spheres, reforms directed at the development of all the knowledge-based economy components and well-organized cooperation between the businesses and the government need to be introduced;

3) the educational and information components of the knowledge-based economy and the production capacity level in Poltava region and the AR of Crimea are at approximately the same rather low, but stable level;

4) in Sumy region the minimum value is inherent to the CICT component (CICT is 0,10). Other components are at the same low level. Among the regions in the third quadrant of the matrix, this region is the most troubled – it has never taken up a position in the first quadrant of the matrix and has the lowest value of the public-private partnership production capacity component. Elimination of the defined shortcomings will enable to improve the investment prospects of the region, which will become an effective tool for establishing contacts with potential investors, foster positive decision-making concerning its implementation on the project territory in the form of public-private partnership. Implementation of the abovementioned measures will have a positive effect on the increase of knowledge-based economy development level in Sumy region.

The second quadrant of the matrix does not include any region, which testifies the following: regions with a low project implementation potential within the framework of public-private partnership cannot be characterized by a high knowledge-based economy development level. Therefore, a conclusion can be made that public-private partnership is a unique accelerating institution that can influence knowledge-based economy development.

Table: KED and PPPP integrated indices

No	Region	KED											PPPP												
		2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
1	AR of Crimea	0,3	0,3	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,5	0,5	0,5	0,5	0,4	0,4	0,4	0,3	0,3	0,3	0,3	0,3
2	Vinnitsia	0,3	0,3	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,4	0,3	0,3	0,3	0,2	0,2	0,2	0,3	0,3	0,3	0,2	0,3
3	Volyn	0,2	0,2	0,1	0,1	0,1	0,1	0,2	0,1	0,1	0,1	0,1	0,1	0,4	0,5	0,4	0,3	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,3
4	Dnipropetrovsk	0,5	0,5	0,4	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,7	0,6	0,6	0,6	0,6	0,6	0,6	0,7	0,6	0,6	0,7	0,7
5	Donetsk	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,5	0,5	0,5	0,5	0,7	0,6	0,6	0,7	0,6	0,6	0,6	0,6	0,6	0,6	0,7	0,7
6	Zhytomyr	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,3	0,3	0,4	0,3	0,2	0,3	0,2	0,2	0,2	0,1	0,2	0,3
7	Transcarpathian	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,3	0,2	0,3	0,3	0,2	0,2	0,2	0,2	0,2	0,2	0,1	0,2
8	Zaporizhzhia	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,2	0,3	0,3	0,5	0,4	0,5	0,4	0,4	0,4	0,4	0,4	0,4	0,3	0,3	0,4
9	Ivano-Frankivsk	0,2	0,2	0,1	0,1	0,1	0,1	0,2	0,2	0,2	0,2	0,2	0,1	0,1	0,5	0,3	0,4	0,3	0,3	0,3	0,2	0,2	0,2	0,2	0,2
10	Kyiv	0,2	0,3	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,3	0,3	0,2	0,3	0,2	0,2	0,2	0,3	0,2	0,2	0,3	0,3
11	Kirovograd	0,2	0,2	0,2	0,2	0,2	0,2	0,1	0,1	0,1	0,1	0,1	0,1	0,3	0,3	0,3	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,3
12	Luhansk	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,5	0,4	0,4	0,4	0,3	0,3	0,3	0,3	0,4	0,4	0,3	0,4
13	Lviv	0,5	0,5	0,4	0,4	0,4	0,4	0,4	0,4	0,4	0,4	0,4	0,4	0,4	0,5	0,4	0,4	0,4	0,3	0,4	0,4	0,4	0,3	0,3	0,3
14	Mykolaiv	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,4	0,4	0,4	0,3	0,3	0,3	0,3	0,3	0,4	0,3	0,2	0,3
15	Odesa	0,3	0,4	0,3	0,3	0,4	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,4	0,5	0,4	0,5	0,4	0,4	0,4	0,5	0,4	0,5	0,5	0,5
16	Poltava	0,3	0,3	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,5	0,4	0,4	0,4	0,4	0,3	0,3	0,3	0,4	0,4	0,3	0,3
17	Rivne	0,2	0,2	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,2	0,4	0,3	0,3	0,3	0,3	0,2	0,2	0,3	0,2	0,2	0,2
18	Sumy	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,5	0,4	0,4	0,4	0,4	0,4	0,3	0,3	0,3	0,3	0,2	0,2
19	Ternopil	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,1	0,3	0,3	0,2	0,2	0,1	0,1	0,1	0,1	0,2	0,1	0,1	0,2
20	Kharkiv	0,6	0,6	0,5	0,5	0,5	0,5	0,5	0,5	0,6	0,6	0,5	0,6	0,6	0,6	0,6	0,6	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5
21	Kherson	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,1	0,1	0,1	0,1	0,1	0,3	0,3	0,3	0,3	0,3	0,2	0,2	0,2	0,2	0,2	0,2	0,2
22	Khmelnysky	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,3	0,2	0,2	0,2	0,2	0,2	0,2	0,1	0,1	0,2	0,2
23	Cherkasy	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,4	0,3	0,3	0,2	0,2	0,2	0,2	0,2	0,3	0,2	0,3	0,3
24	Chernivtsi	0,2	0,2	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,3	0,2	0,2	0,3	0,2	0,3	0,2	0,1	0,1	0,1	0,1	0,2
25	Chernihiv	0,2	0,3	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,1	0,1	0,1	0,5	0,4	0,4	0,3	0,3	0,3	0,2	0,3	0,2	0,3	0,2	0,2

Source: Calculated by the Authors

The first quadrant of the matrix in the opportunity plane «KED – PPPP» is represented by the regions that have a higher value of the integrated indices of knowledge-based economy development level and public-private partnership potential than the medium value in Ukraine. It encompasses 7 regions (28 percent of the aggregate in Ukraine), which are the leaders with respect to knowledge-based economy development factors and/or public-private partnership potential – Kharkiv, Donetsk, Dnipropetrovsk, Lviv, Luhansk, Zaporizhzhia and Odessa regions.

Their growth is characterized by high production capacity and investment and finance potential, which enables them to become the centers for the adjacent territories development. The regions belonging to this quadrant are characterized by: the highest business activity (about 30 per cent within the aggregate of the regions), considerable sales volume (about 48 per cent within the aggregate of the entities under study) and service provision volume (about 30 per cent), high enterprise efficiency level, considerable percentage of investments from various sources, saturation with the credit sector subjects and high level of business activity of the population (over 60 per cent in every region). These factors encourage the increase in project implementation potential of these regions within the framework of or public-private partnership.

The characteristic feature of the given regions is their leading position with regard to one of the knowledge-based economy and/or public-private partnership potential components (the innovation component – Kharkiv, Donetsk, Dnipropetrovsk, Lviv regions; the educational component – Kharkiv, Donetsk, Dnipropetrovsk, Lviv, Luhansk regions; the ICT component – Kharkiv, Donetsk, Dnipropetrovsk and Odessa regions; the PPPP component – Kharkiv, Donetsk, Dnipropetrovsk, and Odessa regions).

The experience of Dnipropetrovsk region in developing and implementing programs at the regional level proves the possibility to combine all financial sources, to utilize the domestic and external resources of the region, to allocate the significant amounts of finance from the regional budget to the solution of socio-economic development problems in accordance with the strategic priorities of the socio-economic and, in particular, financial policy.

The only region, which does not show the defined trend and the integrated indices value of which has never equaled 0,5, but which was added to the first quadrant of the opportunity matrix «KED – PPPP», is Zaporizhzhia region. This can be explained by the fact that it experienced a rather steady development during 12 years.

Negative experience of some regions of this cluster in the sphere of project implementation within the framework of public-private partnership (e.g., in Luhansk region, the project of Russia-based company «Rosvodokanal» failed when the concession holder could not meet the requirements of the concessionary agreement) should not become the barrier for developing this form of cooperation. On the contrary, other regions have completely positive experience of cooperation within the framework of public-private partnership.

For example, the international airport building project was successfully implemented in Kharkiv region at the expense of cooperation between the urban commune and the main investor. Moreover, several projects implementation is planned under the principles of the given partnership (giving up water utilities as well as garbage recycling plant construction to the concession).

6. Conclusions

Thus, the given empiric study enabled to affirm hypothesis (1) concerning concentration of knowledge-based economy and public-private partnership potential around certain powerful regional centers, which will enable to frame the statements: (1) a trend for concentration of knowledge-based economy and public-private partnership potential is observed around some certain powerful local mono-functional regional centres (regions); (2) public-private partnership potential is an efficient means of knowledge-based economy development and support.

The methodological grounds framed and reinforced in the given work enable to assert that public-private partnership should become the institute of accelerated development in terms of knowledge-based economy development at the expense of sharing tasks of the state (public sector) and business multiplicative effects (private sector).

The practical value of the research findings lies in the fact that on their basis certain recommendations may be developed, directions and measures to intensify the use of public-private partnership institute to be employed in real business conditions aimed at knowledge-based economy formation and development may be defined.

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