

Analysis of the relationship between the state of cluster development and sustainable growth: evidence from European countries

Vasyl HYK*, Oleh VYSOCHAN**, Olha VYSOCHAN***

Abstract

One of the important instruments of the industrial and infrastructural policy of the state is the formation of a national system of innovation clusters. Sustainable development can be achieved by creating network structures based on a cluster approach, as such associations include enterprises, research institutions, research centres, government agencies, and financial and consulting structures. The article aims to determine the relationship between the level of cluster development and the level of sustainable growth to formulate recommendations for policies to increase the competitiveness of European economies. This study used a linear correlation between the State of cluster development and the SDG Index, taken from two reports: The Global Competitiveness Report 2019 and Sustainable Development Report 2019. The results of the study confirmed a significant relationship between factors and outcome. Thus, the research hypothesis was proved, which was that there is a high positive correlation between cluster development and sustainable national growth; EU countries with well-developed clusters are countries with high sustainable development and vice versa.

Keywords: cluster, sustainable development, sustainable economy, SDG implementation, correlation

Introduction

In current conditions, the processes of globalization have a profound effect on the economic development of many countries and entrepreneurship. In these

*Vasyl HYK is associate professor at the Lviv Polytechnic National University, Lviv, Ukraine; e-mail: vasyk.v.hyk@lpnu.ua. ORCID: 0000-0002-3008-9216 (corresponding author)

**Oleh VYSOCHAN is professor at the Lviv Polytechnic National University, Lviv, Ukraine; email: oleh.s.vysochan@lpnu.ua. ORCID: 0000-0002-0066-2624

***Olha VYSOCHAN is associate professor at the Lviv Polytechnic National University, Lviv, Ukraine; email: olha.o.vysochan@lpnu.ua. ORCID: 0000-0003-4160-1323

circumstances, there is a need to find competitive advantages based on new forms of business organization. The world economy is undergoing significant changes in the organization of production at the national and regional and international levels. They give rise to the new territorial sectoral and integration associations – clusters, which are voluntary associations of economic entities located in a particular area.

The current stage of the formation of economic and organizational forms of production is characterized by a growing interest in the role and opportunities of cluster formations in socioeconomic development (Vysochan *et al.*, 2021c). In the last two decades, the issues of the principles of activity, and the efficiency of creation and functioning of such associations have become more and more relevant both in theory and in the practice of doing business. Network and cluster relations between companies have significantly changed the practice of economic activity in the modern world. It should be noted that in today's conditions, clusters are the most effective structural entities with a wide range of issues for further study. The effective operation of many clusters has demonstrated their significant competitive advantages over those of non-business entities (Pushkar and Fedorova, 2011).

Enterprise clusters can be characterized as geographically concentrated (compact) groups of interconnected enterprises that compete and (or) conduct joint activities. This is one of the organizational forms of coordination of enterprises, which combines competition and cooperation (combining efforts in some areas helps to compete in others successfully). There are two main categories of clusters, formed by spatial and functional axes. Spatial groups of similar and related firms and industries belong to regional clusters. Functionally related systems, which are less limited to strictly defined regions, belong to industrial clusters. Clusters can have different sizes and shapes depending on their depth and complexity. As a rule, they include the production of the finished product, suppliers of factors of production and services, service industries, sales channels, financial institutions, by-products, and infrastructure (research organizations, educational institutions, etc.).

Clustering processes are the basis for the formation of modern competitive and investment-attractive economic systems. Cluster structures are one of the most effective forms of integrated structures of innovative type (Hyk *et al.*, 2021). The formation of clusters is based on a combination of factors of competition and cooperation, achieving collective efficiency, using the benefits of specialization, economies of scale and more. Accordingly, clusters are an effective form of stakeholder interaction (Vysochan *et al.*, 2021a).

European clustering of industrial structures has been actively developing since 1968 when the Directorate-General for Regional Policy was established within the European Economic Community, and in 1975 was established the European Regional Development Fund. A significant step in this direction was the adoption by the European Parliament in 1988 of the Charter of Regionalism and the creation, based on the provisions of the Charter, of the Council of Regional and Local Associations.

Among the next important steps on Europe's path to the development of cluster and network associations are the following:

- the Lisbon Summit in 2000 confirmed the need for EU countries to establish national clustering programs. The summit also decided to establish a European Research Area (ERA) and approved the Regional Innovation Systems Development Program (RIS) within the EU;
- the Brussels Summit in February 2007, which approved the Europe Clustering Manifesto;
- the Stockholm Summit on 21 January 2008 proclaimed the European Cluster Memorandum, which is currently Europe's action plan to increase competitiveness.

In Europe, high levels of clustering are characteristic of countries such as Austria, Britain, Greece, Denmark, Ireland, Spain, Italy, Germany, the Netherlands, Norway, Portugal, France, Finland, and Sweden. Ukraine introduces world best practices in the formation of clusters for the economic development of their regions. The Ukrainian economists rely on clustering principles that are effectively used in the EU. Ukraine, like most European countries, is trying to reach the economic level of Western Europe and the developed countries of the world and has chosen a strategy of European development. It has a small experience in clustering individual regions.

Today, clustering is the form of internal integration and cooperation of enterprises and organizations that can ensure their stability and synergistic effect. The unification of enterprises into a cluster is the key to achieving sustainable development of the national economy, and positive changes in the environmental and social spheres. It should be noted that starting and supporting the functioning of clusters is a highly urgent issue both for the revival of various branches of domestic production and for ensuring innovative, competitive regional and national sustainable development. The use of the cluster approach is a necessary condition for the revival of domestic production, increasing the efficiency of innovation and investment development of regions, and achieving a high level of economic growth and competitiveness. In these conditions, the relevance of analysing and tracing the relationship between the clustering process and the sustainable development of the national economy is increasing.

The scientific novelty of the study consists of the introduction of a system of indicators, which allows for the evaluation of the value of clusters during the transition to the sustainable development of the economy and checks the significance of these indicators. The proposed indicators can be further processed and used for application with other methods. The conclusion of the study is to show the importance of the clustering process that can contribute to sustainable development. The obtained results can be used in the justification of directions and tools for the implementation of state policy regarding the support of potential centres of economic growth.

1. Literature review and hypotheses development

Many authors and institutions consider clusters as essential and powerful engines for a country's sustainable growth and competitiveness, as well as a tool for improving regional development, innovation, and investment (Porter, 1998; Enright, 2003; England's Regional Development Agencies, 2003; Europe INNOVA, 2008; Nallari and Griffith). M. Porter, an American economist and professor at the Harvard Business School, is considered one of the founders of the cluster approach to the organization of industrial production.

To study the theoretical and methodological foundations of the formation of cluster models of national economies, it is appropriate to consider the main theories that became the basis of the development of the cluster theory (Table 1).

At the current stage the main aspects of clusters as a promising organizational and economic form in the system of sustainable development are reflected in the works: of Derlukiewicz *et al.* (2020), Hyk (2021), Kazlouski *et al.* (2020), Kernasiuk (2020), Kuraś (2019), Kuzmin *et al.* (2017), Levchenko *et al.* (2017), Paraušić *et al.* (2014), Paraušić *et al.* (2017), Pelau and Chinie (2018), Razminiene *et al.* (2021), Rocha *et al.* (2020), Sen and Ongsakul (2018), Siryk *et al.* (2021), Skawińska, and Zalewsk (2009), Slavova-Georgieva, and Bankova (2017), Țițu *et al.* (2015), Vysochan *et al.* (2021b) and others.

Table 1. Economic theories were used as a basis for the development of the cluster theory

Name of the theory (representatives)	Characteristics of the theory	Provisions used as the basis of the study
Theory of economic development (Schumpeter, 1934)	Regulations on the essence of innovations and their importance in the development of the economic system, the main results of ensuring its innovative development	Justification of the results of the creation and activity of the cluster
Theory of financial deepening (Goldsmith, R.W., 1969; McKinnon, R., 1973)	The presence of a directly proportional dependence of economic growth on the level of development and the presence of financial intermediation in the economic system is substantiated	Isolation of the financial and organizational centre as one of the subsystems of the cluster, justification of the qualitative composition of the cluster
Theory of transaction costs (Coase, 1988)	Consideration of the synergistic effect from the interaction of enterprises, which is largely explained by the savings in transaction costs, when obtaining information, specifying property rights, reducing exchange costs	Justification of the cost management system in the integrated structure in the process of optimizing the functioning of financial capital

Theory of industrial clusters (Porter, 1998)	The definition of the cluster was formed, the stages of its formation, and the state policy of development promotion were characterized; the organizational structure of the cluster is substantiated	Identifying the stages of creating clusters, defining approaches to state regulation at individual stages of their life cycle
Theory of regional clusters (Enright, 2003)	Formation of competitive advantages of the region through the creation and effective functioning of regional clusters	Peculiarities of functioning of clusters

Source: Authors' representation

Thus, in their work, Derlukiewicz *et al.* (2020), analyse the policies of the European Union, trying to find the answer to the following question: How can clusters contribute to sustainable development and what are the key factors that ensure this process?

Kuraś (2019) also paid attention to the study of cluster management problems in the context of sustainable development in Poland.

Sen and Ongsakul (2018) investigated the use of clusters to achieve the Sustainable Development Goals (SDGs). The authors used three regions – Central Asia (Georgia), South Asia (Sri Lanka) and Southeast Asia (Vietnam). The analysis confirmed the research goal of determining a more effective approach to the implementation of clusters in achieving sustainable development goals.

The results of a practical study conducted by Slavova-Georgieva and Bankova (2017) show that industrial clusters in Bulgaria used their potential to contribute to sustainable development based on the main characteristics of the cluster (according to cluster theory), in addition to cluster activity, socio-economic and environmental context and state of development (CSR) and clusters are crucial.

Țițu *et al.* (2015) studied the role of regional eco-bio-economic clusters in sustainable development by conducting research based on small and medium-sized enterprises in Romania.

The conducted researches were mostly theoretical or descriptive and are not based on economic and mathematical calculations. It is worth noting that some works were devoted to the use of models and methods. Thus, Kazlouski *et al.* (2020) worked on the development of a structural model for the sustainable development of agritourism, which allows to predict the level of development of the tourism cluster and assess the impact of different management decisions on economic, environmental and social sustainability of the agricultural region. The article uses the method of modelling relationships between latent PLSPM variables as an analysis method.

Razminiene *et al.* (2021) studied the impact of clusters on circular economy (CE) performance in sustainable development. Correlation analysis of the relationship between cluster performance pairs and the transition to CE indicators

was used as a method of determination. The results show that most of the cluster performance indicators had a strong or moderate relationship.

Skawińska and Zalewski (2009) discussed the role of business clusters in sustainable development in general and with a special focus on Poland. The results of the study showed that: 1. eleven regions show a linear relationship between the number of clusters and total ranks and 2. regions with more clusters are more developed economically and socially, but not necessarily ecologically.

An analysis of the relationship between the cluster development and competitiveness is given by Paraušić *et al.* (2014), Levchenko *et al.* (2017), between the cluster development and economic development Paraušić *et al.* (2017). However, they did not comprehensively address the impact of cluster functioning on the sustainable development of European countries.

Thus, the problems of the development of the cluster concept have recently been widely covered by both foreign and domestic scientists. Paying tribute to the scientific work of economists regarding the development of this problem, it should be noted that certain aspects have not been resolved or remain debatable and require further elaboration. Despite the variety of approaches to the formation of the cluster mechanism as a factor of economic growth, the questions regarding the assessment of the interrelationships of the impact of the activity of cluster formations on sustainable development have not been sufficiently researched. It is necessary to develop and substantiate the expediency of using an empirical model of the influence of the activity of cluster structures to increase sustainable development. All of the above gives grounds to propose a research hypothesis:

The research hypothesis is the assumption that cluster development contributes to sustainable growth in Europe.

2. Methodology and data analysis

Data for the study were taken from two reports, namely The Global Competitiveness Report 2019 (World Economic Forum, 2019), prepared by the World Economic Forum and the Sustainable Development Report 2019 (Sachs *et al.*, 2019).

The Global Competitiveness Report 2019 provides information on the Competitiveness Index of the world, which is calculated to help governments, business leaders and other stakeholders in shaping the economic strategies of their countries in the era of the Fourth Industrial Revolution. The index is based on a combination of publicly available statistics and the results of a global survey of company executives. It is formed by 113 variables, combined into 12 benchmarks that determine national competitiveness: 1) Institutions; 2) Infrastructure; 3) ICT adoption; 4) Macroeconomic stability; 5) Health; 6) Skills; 7) Product market; 8) Labor market; 9) Financial system; 10) Market size; 11) Business dynamism; 12) Innovation capability. In our study we used the indicator from the 12th pillar:

Innovation capability – 12.02 State of cluster development, which shows the level and state of cluster development in each country.

The Sustainable Development Report 2019 presents the SDG Index of all UN member states to achieve the Sustainable Development Goals. The values of this index were used in our study. The main criteria that determine the level of sustainable development in a country are the index of sustainable development and the degree of harmonization. The Sustainable Development Index is an integrated assessment that takes into account all three dimensions of sustainable economic, environmental and social development (Vysochan *et al.*, 2022). The degree of harmonization of sustainable development reflects the balance between the economic, environmental and socio-institutional dimensions of sustainable development.

Generalized data on the State of cluster development and SDG Index are given in Table 2.

Table 2. Country rating by State of cluster development and SDG Index

Country	12.02 State of cluster development (Score/Value)	State of cluster development (1-141 place)	Index score of the Sustainable Development	SDG Global rank (1-162 place)
Albania	30,40	133	70,3	60
Austria	65,7	16	81,1	5
Belgium	64,9	14	78,9	16
Bosnia and Herzegovina	33,6	125	69,4	69
Bulgaria	52,8	43	74,5	36
Croatia	30,7	132	77,8	22
Cyprus	48,2	62	70,1	61
Czech Republic	46,8	69	80,7	7
Denmark	67,1	13	85,2	1
Estonia	43,9	85	80,2	10
Finland	64	21	82,8	3
France	62,1	24	81,5	4
Germany	73,5	4	81,1	6
Greece	31,8	128	71,4	50
Hungary	47,2	68	76,9	25
Iceland	52,2	46	79,2	14
Ireland	58,3	29	78,2	19
Italy	74,9	1	75,8	30
Latvia	48,6	60	77,1	24
Lithuania	40,8	97	75,1	32
Luxembourg	68,8	11	74,8	34
Malta	53,1	42	76,1	28
Moldova	26,1	136	74,4	37

Montenegro	44,8	80	67,3	87
Netherlands	70,4	7	80,4	9
North Macedonia	38,6	107	69,4	70
Norway	64,6	20	80,7	8
Poland	46,8	70	75,9	29
Portugal	54,6	37	76,4	26
Romania	38,2	109	72,7	42
Serbia	40	104	72,5	44
Slovak Republic	46,6	71	76,2	27
Slovenia	45,9	76	79,4	12
Spain	55,3	34	77,8	21
Sweden	64,8	19	85	2
Switzerland	71,9	6	78,8	17
Ukraine	40,9	96	72,8	41
United Kingdom	65,9	15	79,4	13

Source: Authors' representation based on data of The Global Competiveness Index, 2019; (Sachs *et al.*, 2019)

To investigate the conditionality of the existing level of cluster development, it is necessary to use statistical methods to measure the relationships and causal relationships between performance and factor indicators. The interdependence between the two indicators 'State of cluster development' and the SDG Index was measured using a correlation coefficient. It is widely used in science to measure the degree of linear dependence between two variables.

A general linear econometric model is a regression model that establishes a linear relationship between economic indicators, one of which is the dependent (explanatory) variable, and all others are independent (explanatory) variables of the model. The dependent variable for such a model is considered an endogenous variable, and the independent variable is an exogenous one. A theoretical ("canonical") general linear econometric model can be specified in the following formula:

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_n x_n + \varepsilon$$

where, y – the dependent (explanatory) variable of the model, x_1, x_2, \dots, x_n – independent (explanatory) model variables or factors, $\beta_0, \beta_1, \beta_2, \dots, \beta_n$ – model parameters, ε – stochastic component of the model, n – the number of explanatory variables of the model. Note that the parameters $\beta_0, \beta_1, \beta_2, \dots, \beta_n$ are also called regression coefficients.

For our study, the formula will be presented as follows:

$$y = \beta_0 + \beta_1 x + \varepsilon$$

where, y – Index score of the Sustainable Development (SDG Index), x – State of cluster development.

Indicator of linear dependence – Pearson’s correlation coefficient is calculated by the formula:

$$r_{xy} = \frac{\sum_{i=1}^m (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^m (x_i - \bar{x})^2 \sum_{i=1}^m (y_i - \bar{y})^2}} = \frac{cov(x, y)}{\sqrt{s_x^2 s_y^2}}$$

where, \bar{x} , \bar{y} – sample averages x^m i y^m , s_x^2 , s_y^2 – selective variances, $r_{xy} \in [-1; 1]$.

Different authors propose different approaches to interpreting the value of the correlation coefficient. At the same time, all criteria are to some extent conditional and should not be interpreted too meticulously. The interpretation of the correlation depends on the context and purpose. In our opinion, the most acceptable is the scale given in the Table 3.

Table 3. The scale of correlation coefficient values

Type of correlation	Very Strong	Strong	Moderate	Weak	Very Weak	No Relation
Negative	-1	-1 to -0.7	-0.7 to -0.5	-0.5 to -0.2	-0.2 to 0	0
Positive	1	1 to 0.7	0.7 to 0.5	0.5 to 0.2	0.2 to 0	0

Source: Author’s representation

The correlation coefficient takes values from -1 to +1. A value of +1 means that the relationship between x and y is linear, and all points of the function lie on a line that reflects the growth of y with increasing x. A value of -1 means that all points lie on a line that reflects the decrease of y as x increases. If the Pearson correlation coefficient = 0, then there is no linear correlation between the variables.

Based on the initial data (Table 2) with the help of the known package «Data Analysis» software, MS Excel built a factor model of dependence.

3. Results

The analysis of the comparison of the positions of 38 European countries in 2019 by sub-index 12.02 State of cluster development (Table 2) shows the leadership of Italy (1st place in the world; 74,9) and other highly developed countries – Germany (4th place in the world; 73,5), Switzerland (6th place in the world; 71,9), Netherlands (7th place in the world; 70,4). The world community’s focus on the regionalization of the economy and the active involvement of small business representatives in all spheres of activity contributed to the development of clusters in Italy. Based on the centuries-old development experience in the country, the so-called “Italian model” was developed, which is a flexible and equal cooperation of family small, medium and large business enterprises.

According to the analysis of the socio-economic system according to the Global Competitiveness Index in 2019, Ukraine remained at the level of 2018 (World Economic Forum, 2018) (57 points), but some indicators have positive trends. In particular, the growth and improvement of positions took place according to the indicator 'Status of cluster development', where there was an increase of 10 points (from 106th place in 2018 to 96th place in 2019), which can be considered a positive trend. However, according to this indicator, Ukraine still lags behind the leading countries (Italy, Germany, Switzerland) by several times.

A slightly different situation is observed for the Index score of Sustainable Development. The top 5 countries in sustainable development include the Scandinavians: Denmark (1st place in the world, 85,2), Sweden (2nd place in the world, 85), Finland (3rd place in the world, 82,8) and Western European countries: France (4th place in the world, 81,5) and Austria (5th place in the world, 81,1). Ukraine took 41st place (72,8) and was ahead of countries such as Romania (42nd place), Serbia (44th place), and Greece (50th place).

Given that the key hypothesis of this study is the assumption that cluster development can increase sustainable growth, we used the tools of correlation and regression analysis, which revealed the importance of the relationship between the national cluster development index and the integrated indicator of sustainable development (Table 4).

Table 4. Regression analysis between the State of cluster development index and the SDG Index by world countries

<i>Regression Statistics</i>	
Multiple R	0,641841932
R Square	0,411961065
Adjusted R Square	0,395626651
Standard Error	3,399879692
Observations	38

Source: Author's calculations

According to table 4, the value of the multiple correlation coefficient in the total number of observations of 38 European countries is 0,64184 which indicates a significantly close relationship between the studied data sets (Chaddock scale). The coefficient of determination (R-square) is 0,41196 %. This means that the calculated parameters of the model by almost 42 % explain the relationship between the studied parameters, also demonstrating the close relationship between variables. However, R is a square whose value < 0.6 indicates that the accuracy of the approximation is insufficient and the model requires the introduction of new independent variables.

To assess the impact of the factor, we will perform variance analysis, the results of which are given in the Table 5.

Table 5. The results of the analysis of variance

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	291,527608	291,527609	25,22043607	1,40471E-05
Residual	36	416,130549	11,5591819		
Total	37	707,658157			
Description of the confirmation of the hypothesis regarding the observed data					
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	
Intercept	66,00586404	2,21342354	29,8207111	5,61695E-27	
X Variable 1	0,207148656	0,04124827	5,02199523	1,40471E-05	
Description with a probability of 95%					
<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>		
61,5168330	70,49489505	61,5168330	70,49489505		
0,12349327	0,290804042	0,12349327	0,290804042		

Source: Author's calculations

Since the actual value of the Fisher ratio (25,22043607) is more critical (1,40471E-05), with a probability of 95% we reject the null hypothesis and we conclude that cluster development affects the value of sustainable growth.

Thus, as a result, the regression equation will take the following form:

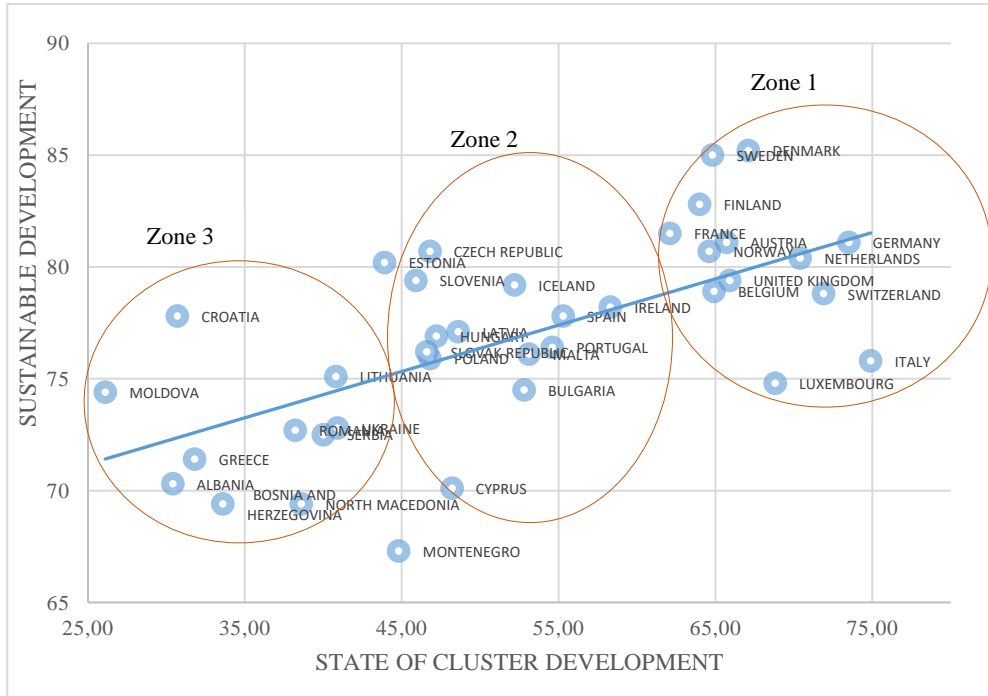
$$y = 0,2071x + 66,006$$

The main content load in the regression equation is carried by the regression coefficient – it is the angular coefficient in the linear correlation equation. The linear function of the regression equation shows how many units, on average, the resulting characteristic (y) will change when the factor characteristic (x) changes by one unit of its natural dimension. That is, the regression coefficient is the variation in y that accounts for a unit of variation in x. The regression coefficient has a unit of measurement of the resulting characteristic. It can be seen from the regression equation that at the level of the State of cluster development indicator of 65, the value of the Index score of the Sustainable Development (SDG Index) will reach the mark of an incomplete 80.

Based on the data set out in the Table 2, create a map that shows the place of each country in the world coordinate system by the level of cluster development (X-axis) and sustainable growth (Y-axis) (Figure 1).

Based on the analysis, 3 zones (groups of countries) were identified between performance and factor indicators: Zone 1 – countries with a high level of development, Zone 2 – countries with a medium level of development and Zone 3 – countries with a low level of development (Table 6).

Figure 1. Positioning of European countries according to the State of cluster development index and SDG Index



Source: Author’s representation

Table 6. Results of zoning countries

Zone number (cluster)	Zone characteristics	Countries
Zone 1	Countries with a high level of development	Denmark, Sweden, Finland, Austria, France, United Kingdom, Norway, Germany, Netherlands, Belgium, Switzerland, Italy, Luxembourg
Zone 2	Countries with an average level of development	Ireland, Spain, Portugal, Malta, Bulgaria, Iceland, Slovak Republic, Poland, Latvia, Hungary, Estonia, Czech Republic, Slovenia, Cyprus
Zone 3	Countries with a low level of development	Albania, Bosnia and Herzegovina, Croatia, Greece, Lithuania, Moldova, Montenegro, North Macedonia, Romania, Serbia, Ukraine

Source: Author’s representation

The data given in the Table 6 shows that Cluster 1 is represented by the highly developed countries of the world, most of which are members of the G-20. One of the peculiarities of the distribution is the location of Italy and Luxembourg in one segment by standard features, although according to the resulting indicators, the latter belongs to the countries with an average level of sustainable development.

Cluster 2 is represented by the southern and eastern EU countries, including the Baltic countries (Latvia, Estonia). Cluster 3 represents countries that had the status of transit and are currently characterized by moderate industrial development. Accordingly, Ukraine has one of the weakest positions in the rankings and is a country with a low level of development.

Although leading European countries are constantly increasing their competitiveness in almost all sectors, there is a wide differentiation in the cluster development component. The countries of the region are divided (as can be seen from Figure 1 and Table 6), with a significant gap in this indicator for Northern and Western Europe compared to Central, Eastern and Southern Europe. Although Brexit and geopolitical changes are felt in the form of crises in many areas, EU countries remain the most competitive in the world and are above the average on the State of Cluster Development Index.

According to the results of cluster analysis, it was established that the distribution of countries by territorial and economic similarity is preserved, the essence of which is that neighbouring countries have similar geographical conditions and implement economic development strategies, focusing on each other, ie territorial factor is important in forming sustainable development of countries. Another factor of similarity is the strategy of economic development.

The combination of the two ratings of cluster development and sustainable growth of countries shows that they reflect the close relationship between them (geographical similarity) and economic strategies (falling into one segment within the cluster, such as countries with the largest economies in the world; Scandinavian countries; Baltic countries).

To a certain extent, the spread of cluster initiatives and the improvement of national competitiveness are possible only in combination with a high level of sustainable economic development. This is confirmed by the results of the analysis, which showed the highest level of interrelation between the components in the group of economically developed countries. In the group of countries with the worst values of the indices, the dependence is also observed, but with further growth of the values of the indicators, the relationship disappears again, which may indicate the instability of the interdependence between the analysed indicators for countries with lower values of the indicators.

The assessment of the ratings of cluster development and sustainable growth of the countries allowed us to determine that they give comparable results that reflect the existing and future potential of national economies. It can also be concluded that the EU as a significant integration entity in the world economy strengthens its

position in the world market as its leading participant and independent economy, which focuses on it as the largest regional market in the world. On the other hand, medium and weak in terms of economic development member states and candidate countries have not strengthened their positions in the rankings, which leaves the question of finding ways to further their growth relevant.

Conclusions

To analyse the positioning of European countries in the global space, a study of the relationship between indicators of cluster development and sustainable growth of national economies, identified the place of Ukraine in interstate comparisons. The study of the state of the country in the global dimension was conducted based on indicators of the State of cluster development and the SDG Index, taken from two reports: The Global Competitiveness Report 2019 and Sustainable Development Report 2019.

The step-by-step correlation-regression analysis of factors helped to reliably assess the influence of factors, determine their correlation characteristics, form correlation models and perform a statistical evaluation of communication parameters. It can be concluded that this factor is in a solid causal relationship with the performance indicator and has a significant impact on it. The sample of 38 European countries is large and representative, as the countries in the sample together produce the vast majority of the world's gross domestic product. However, such interdependence is not uniform across groups of countries. At the same time, the relationship between the indicators is best expressed in the group of the most developed countries. This confirms the fact that attention should be paid to balanced development in all spheres – both in clustering processes and in the sphere of sustainable economic development.

But to accurately assess the effect of the factor, the analysis proved the feasibility of taking into account other factors in the study separately, because their complex impact in real life cannot be estimated theoretically – there is a high probability of error, which is called statistical methodology.

Based on the cluster analysis, a classification of countries was developed and 3 zones (groups of countries) were identified: Zone 1 – countries with a high level of development, Zone 2 – countries with a medium level of development and Zone 3 – countries with a low level of development. The results of the analysis allow us to conclude that Ukraine is twice behind the world's leading countries and is in zone 3. The main reason for this is that the legal basis for the formation of an economic cluster has not yet been created in Ukraine. At the same time, the implementation of cluster initiatives can be one of the sources of growth in the country's economic well-being.

Thus, according to the analysis results, sustainable development of the country's economy is impossible without strengthening cluster development, and

therefore increasing the latter inevitably leads to accelerated economic transformation. Given this, the cluster model should be used to increase competitiveness, stimulate innovation and improve national economic policy, regional development programs and the interaction of all forms of entrepreneurship.

In our opinion, the prerequisites for the formation of a cluster economy at the state level are inextricably linked with sustainable development. Therefore, the substantiation of the directions and tools of the state policy to support sustainable development and increase competitiveness, taking into account the factors and characteristics of clusters, is promising for further scientific research.

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