International Journal of Industrial Engineering & Production Research March 2023 Vol. 34, No. 1: 1-11
DOI: 10.22068/ijiepr.34.1.9

RESEARCH PAPER

Economic Monitoring of Transformation Processes: National Realities and Foreign

Inna Irtyshcheva[1], Olena Pavlenko[2], Yevheniia Boiko[3], Iryna Kramarenko*[4], Kseniia Chumakova[5], Natalia Hryshyna[6], Olena Ishchenko[7] & Anastasiia Zubko[8]

Received 13 May 2022; Revised 24 December 2022; Accepted 1 January 2023;

ABSTRACT

The research is devoted to the theoretical and applied organizational bases to hold the comparative analysis of the economic development of the regions of the Black Sea region. The article's primary purpose is the comparative analysis of the economic development of the Black Sea region. The article tests the authors' hypothesis about the adequacy of the indicators defined for evaluation through the proposed number of relative indicators, which in the complex will characterize the achievements of the region in ensuring the economic stability of the regional system, quality of transformation processes and indirectly the conditions created by public authorities for economic development. There is confirmed dependence on the use of the proposed methodological approaches and the constructed comparative profile of the regions of the region, which can help identify the strengths and weaknesses of the region, outline critical issues, and develop regional development plans and programs. Based on the developed methodological approaches, the general vector of economic growth for each of the regions of the Black Sea region with coordinates is calculated. The direction of the vectors obtained in all Black Sea regions corresponds to the general tendencies achieved in Ukraine. That is, we can talk about some progress in strengthening the economic situation of the regions in general on several indicators studied. The positive direction of the vector indicates that, in general, most indicators show positive changes in the direction of economic growth. It is determined that the most significant vector length in the Mykolaivska region, which indicates that the region, on several economic indicators, achieved higher results than in other regions of the Black Sea region and, on average, in other regions of Ukraine during the study period.

KEYWORDS: *Public administration; Economic development; Region profile; Economic efficiency; Budget efficiency; Investment and innovation activity; The efficiency of foreign economic activity.*

1. Introduction

In current conditions, the effectiveness of the country, regions, and individual territories is considered in the context of a new paradigm of "sustainable development", which involves the transition of socio-economic systems to a model capable of sustainable economic growth, high levels of social justice and human development and environmentally friendly nature, i.e., create the conditions to satisfy the needs not only of the present but also future generations. An important step in assessing the effectiveness of sustainable development is the choice of mathematical

* **Corresponding author:** ***Iryna Kramarenko***
mhafizul@unikl.edu.my

1. *Department of Management, Admiral Makarov National University of Shipbuilding, Heroes of Ukraine Prospect, 9 Mykolaiv, 54000, Ukraine.*
2. *Department of Public Administration and Management of Environmental Activities, Odessa State Environmental University, 15 Lvivska Str., Odessa; 65016, Ukraine.*
3. *Department of Management, Admiral Makarov National University of Shipbuilding, Heroes of Ukraine Prospect, 9 Mykolaiv, 54000, Ukraine.*
4. *Department of Management, Admiral Makarov National University of Shipbuilding, Heroes of Ukraine Prospect, 9 Mykolaiv, 54000, Ukraine.*
5. *Municipal Institution of Higher Education, Khortytsia National Educational Rehabilitation Academy of Zaporizhzhia Regional Council, 59 Naukovoho Mistechka Str., Zaporizhia, 69017, Ukraine.*
6. *Department of Management, Admiral Makarov National University of Shipbuilding, Heroes of Ukraine Prospect, 9 Mykolaiv, 54000, Ukraine.*
7. *Department of Management, Admiral Makarov National University of Shipbuilding, Heroes of Ukraine Prospect, 9 Mykolaiv, 54000, Ukraine.*
8. *Public Institution «Institute of Environmental Economics and Sustainable Development of the National Academy of Sciences of Ukraine», 60 Mr. Taras Shevchenko, Kyiv, 01032, Ukraine.*

assessment tools, which will, at the same time, identify the weaknesses of the region to ensure achievements in certain areas, assess progress in certain areas, and provide an accessible interpretation of the data, and therefore in today's business environment is quite relevant.

2. Literature Review.

Each region has unique resources and opportunities to implement the Sustainable Development Goals, reduce or mitigate environmental problems, modernize the economy, create conditions for business development, and improve the investment climate and life of the population through the introduction of a systematic strategic approach to governance. As M.V. Vishivanyuk notes, "With sustainable development, regional interests are realized to the greatest extent. Therefore, at the present stage, regional authorities are tasked with maintaining certain sustainability parameters through internal regional resources. Therefore, it carried out a comprehensive assessment of the level of socio-economic development of regions in Ukraine in the current and future periods in order to determine the possibility of solving the problems of socio-economic development of regions using existing internal sources and reserves of economic growth aimed at implementing socio-economic policy" [1].

"The economic importance of coastal regions in the development of Ukraine is primarily in the presence of maritime and port industries and transit potential. In addition, the coastal regions of Ukraine are the traditional place of rest and recuperation of the large part of inhabitants in Ukraine, an integral part of the tourism industry" [2].

In the context of limited financial resources, an essential factor in the region's economic growth and one of the primary sources of financing social and environmental vectors of development is the effective management of budgets at all levels. As noted by Kostyrko L.A. and Valentychyk N.Yu., "in the conditions of decentralization and increasing the independence of local budgets, the responsibility of local authorities for the results of their financial activities. At the legislative level, there are no methods for analyzing the financial condition of local budgets, which reduces the interest of local authorities in its research and improvement." [6]

At the same time, the region's budget (territory, community) is one of the practical tools and, at the same time, the area of responsibility of public authorities. The efficiency of fiscal policy depends on the welfare of the territory, the development of human potential, and the investment climate in the region. Therefore, the fiscal policy performance in the region is considered one of the essential components of the vector evaluating the region's economic development in the context of the efficiency of public administration.

We can not disagree with the opinion of Stavnich M.M., which to the priority goals of state regional financial policy in current conditions include the following:

"– determination on the principles of social justice of the level of budget support of the region, which reflects the effectiveness of the implementation of state and regional financial policy;

- ensuring the budget security of the region as a factor of effective socio-economic development by activating and mobilizing internal financial sources of the region, including budget resources in conditions of their limited" [7].

The article's purpose is to discuss the business process of economic monitoring of national transformation processes and the use of foreign experience in development.

3. Materials and Methods.

One of the vectors of sustainable development, which forms the primary conditions for the effective movement of the region in the direction of other vectors, is to ensure economic growth. According to the methodological approaches below, the assessment of the economic vector of sustainable development of the region based on available statistical information involves the analysis of the following groups of indicators: general economic efficiency, budget efficiency, investment activity, innovation activity, and foreign economic activity of economic entities in the region. In addition, several relative indicators are proposed to assess these indicators, which will characterize the region's achievements in ensuring the economic stability of the regional system, the quality of transformation processes, and, indirectly, the conditions created by public authorities for economic development. The list of leading indicators and indicators for assessing the economic vector of sustainable development is given in Table 1.

Tab. 1. Indexes and indicators of the economic vector of sustainable development of the region

Indexes	Indicators	Designation of indicator
Economic efficiency (E)	Volumes of gross regional product per capita, UAH	e_1
	Volume of sold industrial products per capita, UAH	e_2
	Volume of agricultural production per 100 hectares of agricultural land, thousand UAH	e_3
	Volume of construction works performed per capita, UAH	e_4
	The share of profitable enterprises in the region,%	e_5
Budget efficiency (B)	The amount of budget revenues per capita, UAH	b_1
	Capital expenditures of the budget per capita, UAH	b_2
	Budget coverage ratio,% (revenues / expenditures)	b_3
	Coefficient of tax independence of the budget,%	b_4
	Coefficient of budget independence,%	b_5
Investment and innovation activity (I)	Volumes of capital investments per capita, UAH	i_1
	Volumes of foreign investment per capita, USD	i_2
	The share of innovation-active industrial enterprises in the total number,%	i_3
	The share of innovative products in total sales,%	i_4
Efficiency of foreign economic activity (C)	Exports of goods per capita, USD USA	c_1
	The volume of exports of services per capita. USD	c_2
	Export coverage ratio of imported goods	c_3
	Export coverage ratio of import services	c_4

Source: Systematized by the author

In order to assess the effectiveness of sustainable development of the region, we have proposed the following evaluation algorithm:

1. Determine the direction and length of the vector of each target indicator for assessing the effectiveness of sustainable development of the region by formulas:

$$G1=1ni=1.11.nIs\times100-100 \quad (1)$$

where, G1 - the overall target index within the selected vector. Shows the overall progress (+) or lag (-) of the region on a particular aggregate;
Is – standardized value of the indicator;
If - the actual value of a single indicator of goal achievement;
Ie – reference (target, comparative) value of the indicator;
n – number of indicators.

Provided that the comparative indicators are expressed in absolute or relative terms, except for percentages or shares of the unit:

$$Is=IfIe \text{ (for stimulants) or } Is=IeIf \text{ (for destimulants)} \quad (2)$$

Provided that the benchmarks are expressed as a percentage or fraction of a unit:

$$Is=If-Ie \text{(for stimulants) або } Is=Ie-If \text{ (for destimulants)} \quad (3)$$

2. Determine the total length of the vector of sustainable development:

$$V=1mi=1mGi \quad (4)$$

where, V- vector of sustainable development of the region, points
m – number of aggregate indicators.

From the point of view for different starting conditions for sustainable development of the regions of Ukraine it is proposed to carry out the analysis in two stages.

At the first stage, the position of the region in the base year is determined in comparison with the best achievements in the field of sustainable development among other regions VT. That is, the maximum value (for progressors) or minimum (for regressors) value is selected as a reference value and compared with the corresponding actual data of the evaluated region.

The second stage is to determine the region's progress towards achieving the goals of sustainable development. To this end, the actual value of each indicator is compared with the value achieved in the previous period GT.

To determine the effectiveness of economic development of the region, it is proposed to use the concept of the vector of economic growth with coordinates (0; X; У). Where, X is an integrated indicator of economic development of the region, calculated as a weighted sum of aggregate indicators (economic efficiency; budget efficiency; investment and innovation

activity; foreign economic efficiency of the region), taking into account the growth rate of component indicators for the analyzed period in the region. У - integrated indicator of economic development achieved in the country, calculated as a weighted sum of aggregate indicators (economic efficiency; budget efficiency; investment and innovation activity; foreign economic efficiency of the region), taking into account the growth rate of composite indicators for the analyzed period on average in all regions. The vector will determine the direction of economic growth in view of the achievements of other regions in this area.

Taking into account the proposed indicators, the coordinates of the vector are calculated by formulas:

$$У=Ес\times0,25+Бс\times0,25+Іс\times0,25+Зс\times0,25 \quad (5)$$

where, У – integrated indicator of economic development, achieved on average in the regions of Ukraine during the analyzed period;

Ес - aggregate indicator of economic efficiency of regions, achieved on average by regions of Ukraine during the analyzed period;

Бс - aggregate indicator of budget efficiency, achieved on average by regions of Ukraine during the analyzed period;

Іс - aggregate indicator of investment and innovation efficiency, achieved on average by regions of Ukraine during the analyzed period;

Зс - aggregate indicator of efficiency of foreign economic activity, achieved on average by regions of Ukraine during the analyzed period.

$$Х=Ер\times0,25+Бр\times0,25+Ір\times0,25+Зр\times0,25 \quad (6)$$

where, Х – integrated indicator of economic development achieved in the assessed region during the analyzed period.

The Black Sea region was chosen as the object of research into the effectiveness of sustainable development processes. The choice is because this region has a favorable geographical location, a high industrial and agricultural production level, and a solid social, scientific, and resource potential for effective development from a strategic perspective. However, due to the temporary occupation of the Autonomous Republic of Crimea and the city of Sevastopol, which were territorially part of the Black Sea region, we do not have the opportunity to investigate the state and directions of development of these administrative units. Therefore, our study focuses on analyzing and evaluating processes and current results of socio-economic development and achievements in the environmental policy field of three regions: Odeska, Mykolaivska, and Khersonska.

4. Results and Discussion.

For more in-depth analysis, a comparative assessment of the economic vector of development of the Black Sea region in terms of regions according to the indicators proposed in Table 2. Given that adapting the Sustainable Development Goals to the realities of the domestic economy and their gradual implementation began in 2016, the basis for comparing some progress achieved at the national and regional levels as of early 2021 is the indicator for 2015. Table 2. shows the initial indicators of the assessment of the economic vector of development of the Black Sea region and comparative indicators achieved on average in Ukraine.

They use the data in Table 1. and formulas 1.-2. Indicators of progress achieved both on average at the national level and in terms of regions of the Black Sea region on the way to achieving the selected goals of economic development are calculated.

Tab. 2. Indicators of economic development of the Black Sea region

Regions	Period	Volumes of gross regional product per capita, UAH	Volume of sold industrial products per capita, UAH	Volume of agricultural production per 100 hectares of agricultural land, thousand UAH	Volume of construction works performed per capita, UAH	The share of profitable enterprises in the region,%
		e_1	e_2	e_3	e_4	e_5
Ukraine (average value)	2015	41897,6	36090,8	761,0	1524,9	75,5
	2021	72995,2	51773,9	817,1	2867,1	68,7

	$\overline{GT}$	74,2	43,5	7,4	88,0	-6,8
Mykolaivska region	2015	41501,0	38799,7	535,6	1713,1	79,8
	2021	71180,1	51211,9	517,3	2461,6	78,7
	$\overline{GT}$	71,5	32,0	-3,4	43,7	-1,1
Odeska region	2015	41682,0	18948,4	530,5	2798,9	75,6
	2021	73320,0	24422,3	531,5	6527,3	76,2
	$\overline{GT}$	75,9	28,9	0,2	133,2	0,6
Khersonska region	2015	30246,0	22231,8	593,5	621,1	77,7
	2021	45532,0	27577,6	607,1	1172,9	76,3
	$\overline{GT}$	50,5	24,0	2,3	88,8	-1,4

Source: Research results

Also, considering the progress (GT) in economic development according to selected indicators at the national level, the highest rates of positive changes in the regions are observed on the indicators of growth of gross regional product (70%), sales of industrial products (43%) and construction work 88%). Unfortunately, the positive trends are partly provided by the devaluation of the national currency and population decline during the analyzed period. Insignificant changes in the volume of increase in agricultural production and decrease in the share of profitable enterprises also confirm this. About the Black Sea region, it should be noted that trends specific to the national economy with slight deviations are also observed in the analyzed areas.

By the proposed methodological approaches, a comparative assessment of the economic development of the regions of the study region in terms of key indicators with the average values achieved in other regions.

The comparative analysis indicates that in most of the studied indicators, the Black Sea region is inferior to the average value achieved in other regions of Ukraine. The worst situation is in industrial and agricultural production, which indicates the loss of competitive position in the region and insufficient efficient use of existing production and agricultural potential.

After analyzing scientific approaches to assessing the effectiveness of budget resources management in the region, we identified the following indicators that generally characterize the effectiveness of budget policy in the context of economic development: budget revenues per capita, UAH, capital expenditures per capita population, the coefficient of budget coverage, the coefficient of tax independence of the budget and the coefficient of budget independence.

Tab. 3. Shows the main indicators of the budget of the black sea region in 2015 and 2021.

Indicator	Period	Mykolaivska	Odeska	Khersonska
Budget revenues	2015	8082669	16507605	7018685
	2021	14720800	32280100	13451100
Increase, %		82	96	92
Budget revenues	2015	7769586	15952187	6848729
	2021	14778100	32744500	13421000
Increase, %		90	105	96
Tax revenues	2015	2483912	5695389	1799006
	2021	5826200	15073700	4438000
Increase, %		135	165	147
Intergovernmental transfers	2015	5139697	9567133	4745591
	2021	8287600	15000400	8265000
Increase, %		61	57	74

Source: Research results

These tables show an improvement in the local budgets of the Black Sea region for the period 2015-2021. In particular, during the period under review, local budget revenues increased by an average of 92% in the region, tax revenues increased by 135-165%, and intergovernmental

transfers. The negative trend is the outstripping growth of budget expenditures over revenues, leading to a budget deficit. One of the factors that stimulated the increase of the level of tax revenues to local budgets and, accordingly, the increase of budget independence is the gradual introduction of the budget decentralization reform, which provides for a certain expansion of the tax base to fill local budgets and increase the independence of public administration in the regions to make, including financial decisions.

According to Wozniak G.V., "Successful budget decentralization helps to increase the financial potential of the territory, intensify investment activities, stimulate entrepreneurial activity, which ultimately strengthens the economic potential and provides a" ground "for growth and development. Perhaps the most important aspect of budget decentralization is the right of local authorities to determine the forms of public service" [10]. Along with the benefits, the responsibility of public authorities in the region for the processes of formation and redistribution of budget revenues is growing. The decisions of regional authorities determine the effectiveness of the budget policy, the implementation of regional development programs, and their financing, providing conditions for human development in the territory.

They are using the data of Table 3. and statistical data of the State Statistics Service of Ukraine, the calculation of relative indicators of efficiency of local budgets on average in Ukraine, and terms of regions of the Black Sea region. The results of the calculations are shown in table 4.

Analyzing these tables, it should be noted that in 2021 most of the efficiency indicators of local budgets improved on average in Ukraine and within the Black Sea region. In particular, there is a significant increase on average by 66% of budget revenues per capita, and capital investment from budgets at all levels increased per capita (+ 122% on average in Ukraine and 30% in the Black Sea region). The calculations also showed an increase in the tax capacity of the region's budgets, which in 2018 averaged 36%, and in the Odessa region - 46.7%. That is, tax revenues cover more than 30% of budget expenditures. The growth of budget independence is also positive, which confirms the effectiveness of the implementation of decentralization reform in the regions and creates the foundations for the gradual self-sufficiency of the regions in the field of financing.

Tab. 4. Indicators of efficiency of local budgets of the black sea region

Indicators		The amount of budget revenues per capita, thousand UAH	Capital expenditures of the budget per capita, UAH	Budget coverage ratio,%	Coefficient of tax independence of the budget,%	Coefficient of budget independence,%
		b_1	b_2	b_3	b_4	b_5
Ukraine (average value)	2015	3,6	0,9	101,0	32,0	62,0
	2021	6,0	2,0	96,0	38,4	65,0
	$\overline{GT}$	66,7	122,2	-5,0	6,4	3,0
Mykolaivska region	2015	3,4	0,9	104,0	30,7	61,1
	2021	5,3	1,0	99,6	39,6	64,0
	$\overline{GT}$	55,9	11,1	-4,4	8,8	2,9
Odeska region	2015	4,2	1,3	103,5	34,5	63,3
	2021	6,8	1,9	98,6	46,7	68,3
	$\overline{GT}$	61,9	46,2	-4,9	12,2	5,0
Khersonska region	2015	2,7	0,5	102,5	25,6	59,7
	2021	4,5	0,7	100,2	33,0	61,9
	$\overline{GT}$	66,7	40,0	-2,3	7,4	2,3

Source: Research results

Along with the positive trends, the processes of formation and implementation of local budgets are accompanied by certain problems, including the growth of the deficit due to increased burden

on local budgets due to the transfer of social expenditures, including health care financing, social infrastructure development, vocational training etc. Thus, in 2015 the average ratio of budget coverage was 101%, in 2021 - 96%. On average, except for the Kherson region, there is a decrease in the coefficient of budget coverage for the analyzed period by 5%. The growth of the budget deficit leads to the freezing of funding for certain regional programs, the search for credit and other resources, which, provided insufficient management, will create financial obstacles to the sustainable development of the region.

Calculations have shown that in 2019 the analyzed indicators of budget efficiency are higher than the average only in Odeska region. The worst situation is in Khersonska region, where the indicators are significantly lower than the average values between the regions of Ukraine. Such significant disparities, while maintaining existing trends, will constrain the sustainable development of territories and strengthen interregional differentiation in the social and economic spheres.

An important group of indicators that indirectly characterize the quality of public administration at the level of the region and individual territories is investment and innovation activity and the state of the investment climate.

We agree with the opinion of Kryshtal T.M., Lagler K. and Pidvalna O.G. that "attracting direct investment to the regional economy is one of the key areas of sustainable development. Foreign direct investment is seen as an important catalyst for economic growth, as it opens up access to new effective ways of management and marketing. Sustainable regional development involves attracting direct investment, which is focused on developing the potential of local industry, creating clusters in technological chains. Currently, the most ready to receive direct investment are: retail chains; construction of business infrastructure; cluster based on processing of agricultural products; a cluster based on the production of fruits and vegetables; grain cluster; production of building materials; mechanical engineering, etc." [12].

To assess regional efficiency in the field of investment and innovation development, a system of the following relative indicators is proposed: volumes of capital investments per capita (i1); volumes of foreign investments per capita (i2), the share of innovation costs in capital investments (i3), the share of innovative products in total sales (i4), the share of innovation-active industrial enterprises in the total number (i5). These indicators generally characterize the intensity and degree of innovation of investment processes in the region.

During the study period, there were negative trends in the reduction of foreign direct investment in the economy of Ukraine, which per capita decreased by an average of 10%. These trends are typical for Odeska region (-9.1%), while in Mykolaivska and Khersonska regions there is a slight increase (1.4 and 2.4%, respectively).

Negative trends are typical also in the field of innovative activity of industrial enterprises of the region, except for Khersonska region. During 2015-2021, the share of innovation-active enterprises in Odeska and Mykolaivska regions decreased by 2% and amounted to 14-15% of all industrial enterprises in 2021, and the share of innovative products in total sales decreased by 1%. According to calculations, in terms of innovation activity against the background of general deterioration, the situation in Khersonska region has improved, in particular the share of innovation-active enterprises increased by 1%, and the share of innovative products in total industrial - by 0.1%. At the same time, the level of innovation activity in the Black Sea region remains critically low and does not even meet the conditions of the preparatory stage of building an innovative model of sustainable development of the region.

Tab. 5. Indicators of investment and innovation development of enterprises in the black sea region

Indicators		Volumes of capital investments per capita, UAH	Volumes of foreign investments per capita, USD USA	The share of innovation-active industrial enterprises in the total number,%	The share of innovative products in total sales,%
		i_1	i_2	i_3	i_4
Ukraine (average value)	2015	6632,2	621,2	18,0	1,8
	2021	10023,3	558,6	16,0	0,9
	$\overline{GT}$	51,1	-10,1	-2,0	-0,9

Mykolaivska region	2015	7774,4	197,5	17,0	0,3
	2021	7885,4	200,3	15,0	0,3
	$\overline{GT}$	1,4	1,4	-2,0	0,0
Odeska region	2015	6142,2	560,0	16,0	1,2
	2021	8378,0	509,2	14,0	0,2
	$\overline{GT}$	36,4	-9,1	-2,0	-1,0
Khersonska region	2015	3978,3	191,6	14,0	1,4
	2021	6087,9	196,2	15,0	1,5
	$\overline{GT}$	53,0	2,4	1,0	0,1

Source: Research results

Based on the proposed methodological approaches, a comparative assessment was made and the profile of investment and innovation activity in the Black Sea region was determined based on the comparison of certain indicators with the average value for Ukraine in 2021. Thus, the worst situation in the Black Sea region is in the field of investment support, where relative indicators of capital investment per capita are significantly lower than the average for the regions of Ukraine, and foreign investment in Mykolaivska and Khersonska regions is only 64% of the average. In turn, the indicators of innovation activity are not so critically different and are lower by 1.5-4%. In view of the above, it can be concluded that the organizational and economic mechanism for regulating investment and innovation activities of the Black Sea region is inefficient, and the authorities do not pay enough attention to stimulating investment and innovation processes.

We also include indicators of efficiency of foreign economic activity in the indicators of efficiency of public administration in the sphere of economic development of the region. Foreign economic relations and the activity of public administration in this area are a particularly important component of the management of the region, which is at the intersection of important transport hubs, has a strong transport and logistics potential. Effective use of the available foreign economic and transport potential creates a number of significant advantages for strengthening the economic potential and achieving the goals of economic development and social security.

Table 6 shows the indicators of foreign economic activity of the regions of the Black Sea region in terms of the main regions and comparative data of the average value in Ukraine for 2015 and 2021. Table data show that for the period from 2015 to 2021 in Ukraine, the volume of exports of goods per capita decreased twice, i.e. by 100%, and the volume of exports of services per capita increased by 21%.

Such a sharp decline in exports of goods, which negatively affected the state of Ukraine's foreign trade balance, is a consequence of the loss of some markets due to the military conflict with Russia, which was Ukraine's largest trading partner until 2014, occupation of Ukraine and deteriorating transport trade with other countries in the East.

The use of the proposed methodological approaches and the construction of a comparative profile of the regions of the region can be useful for identifying the strengths and weaknesses of the region, outlining key issues and developing regional development plans and programs.

An important step in assessing the effectiveness of public administration is to determine the progress or regression of the region on a set of indicators that allows you to measure the pace of change, the consequences of certain decisions and reforms for regional development, outline the main areas of development.

Using the effective data of the study, we calculate the coordinates of the vector of economic development for the regions of the Black Sea region:

У=36,6×0,25+38,6×0,25+9,5×0,25- 41,5×0,25=10,8
X M= =23,4×0,25+14,8×0,25+0×0,25+ 44,8×0,25=20,8
X O= =42,7×0,25+24×0,25+6,1×0,25- 31,1×0,25=10,4
X X= =32,9×0,25+22,8×0,25+13,6×0,25- 7,8×0,25=15,4

The direction of the vectors obtained in all Black Sea regions corresponds to the general tendencies achieved in Ukraine. That is, we can talk about some progress in strengthening the economic

situation of the regions in general on several indicators studied. The positive direction of the vector indicates that, in general, most indicators show positive changes in the direction of economic growth. Furthermore, the perfect length of a vector in the Mykolaivska region testifies that in the area on several economic indicators, higher results are reached than in other areas of the Black Sea region and, on average, in other regions of Ukraine.

To strengthen the economic situation and accelerate the region's movement towards sustainable economic growth, it is necessary to strengthen the weaknesses identified in the process of indicative analysis for each region by developing appropriate regional programs, improving the investment climate, and promoting the business sector.

The proposed methodological approaches are universal, i.e. they can be applied both at integrated indicators and at lower levels of aggregation (aggregate indicators, unit indicators), which will determine the general trends of economic development and results achieved in all aspects of regional governance.

Most scholars consider studying advanced foreign experience to improve the management of national territories in the context of transformation processes [3;13] and the use of economic and mathematical modeling [4; 11].

Europe is facing a complex and uncertain economic outlook. Governments, households, and firms are grappling with the energy and cost-of-living crisis that was aggravated by the war in Ukraine. As high energy prices are increasingly feeding through to other sectors of the economy, inflationary pressures have become more broad-based. In October 2022, year-on-year consumer price inflation in the European Union climbed to a record high of 11.5 percent. The cost of energy remained the biggest driver of overall inflation, with energy prices rising by 38.7 percent from a year ago. Core inflation – excluding energy, food, alcohol, and tobacco – also accelerated, reaching 6 percent. High and persistent inflation is eroding households' purchasing power and driving up firms' production costs while also adding pressure on central banks to further hike interest rates [16].

Going forward, policies will have to increasingly address longer-term challenges to the region's industrial competitiveness. If energy and gas prices stay elevated, many energy-intensive businesses in competitive industries may lose market shares and move to locations with cheaper energy. For example, the EU's fertilizer industry has warned that high natural gas prices are driving up input costs and undermining the sector's global competitiveness. In Germany, pundits have voiced fears of deindustrialization after its largest chemical company announced that it would be permanently downsizing its operations in Europe to escape high energy costs. While such fears may be overblown, Europe's policymakers face difficult trade-offs as they adjust to new geopolitical and energy market realities [16].

5. Discussion

One of the tools for balancing sustainable development priorities in EU regional systems is the application of intelligent specialization, a cross-cutting tool for strategic planning and funding allocation. Today, this concept and opportunities for its implementation in the regions are recognized as one of the priorities of state regional policy.

Monitoring economic, social, and cultural rights may, at times, require forging new partnerships, including with professionals who have not traditionally been involved in human rights work (urban planners, public health professionals, or nutritionists, for example). Strategic decision-making must incorporate these aspects and encourage "out-of-the-box" alliances and partnerships with local, national, and international stakeholders in various fields [17].

The smart specialization tool's use in regional development strategy processes is currently at the stage of adaptation and pilot studies. The limiting factors for the implementation of intelligent strategy are currently:

imperfect regulatory and legal support for the regulation of investment support for innovation in the regions

low level of development of science and technology in most regions

lack of staff capable of developing and implementing projects

resistance to change at different levels

limited financial resources and high levels of corruption

The efficiency of transformation processes by the changes defined in the strategy also depends on the art of public administration on the ground and the introduction of relatively new organizational tools that operate successfully in market economies, namely: the introduction of innovative technologies of sectoral and spatial management, development of social responsibility of business and intensification of public-private partnership projects with expansion of the circle of its participants, development of effective tools of assessment and

monitoring of realization of the Sustainable Development Goals.

6. Conclusion

Indicators and indicators of sustainable economic development of the region are systematized, which will characterize the achievements of the region in ensuring the economic stability of the regional system, the quality of transformation processes, and indirectly the conditions created by public authorities for economic development, grouped into the following blocks: economic efficiency, budget efficiency, investment, and innovation activity of economic entities and foreign economic efficiency of the region.

There was a comparative analysis of the effectiveness of economic development of the Black Sea region in terms of the main regions, the results of which determine its current profile at the beginning of 2021 compared to the average achieved in the regions of Ukraine, as well as the vector of economic development, illustrating the economic growth of regions on the selected system of weighted indicators and indexes. According to the results of calculations in 2018, the regions of the Black Sea region lag behind the average level in almost all aggregate indicators of economic development. The largest negative disparities are characteristic of the Khersonska region, whose level of economic development is more than 20% lower than the average level for all groups of indicators. Odeska region leads in terms of the overall economy (10%) and budget efficiency (8%). In the Mykolaivska region, the potential of foreign trade (81% above average) is relatively developed. The defined profile in terms of indicators can be used to identify the strengths and weaknesses of the region, outline key issues, and develop regional development plans and programs (Table 6).

Tab. 6. Indicators of foreign trade efficiency of the black sea region

Indicators		Exports of goods per capita, USD USA	The volume of exports of services per capita. USD	Export coverage ratio of imported goods	Export coverage ratio of import services
		c_1	c_2	c_3	c_4
Ukraine (average value)	2015	8916,4	227,7	10,2	1,8
	2021	1122,9	276,1	0,8	1,8
	$\overline{GT}$	-100,0	21,2	-91,9	4,6
Mykolaivska region	2015	1384,1	384,7	2,8	8,7
	2021	1867,7	440,7	2,9	19,7
	$\overline{GT}$	34,9	14,6	2,3	127,3
Odeska region	2015	722,7	375,2	1,8	6,8
	2021	638,8	308,0	1,0	3,4
	$\overline{GT}$	-11,6	-17,9	-45,0	-49,8
Khersonska region	2015	224,4	24,8	1,7	3,2
	2021	260,1	29,5	0,8	2,8
	$\overline{GT}$	15,9	19,1	-52,9	-15,1

Source: Research results

Based on the developed methodological approaches, the general vector of economic growth for each of the regions of the Black Sea region with coordinates is calculated (0; X, У). The direction of the vectors obtained in all Black Sea regions corresponds to the general tendencies achieved in Ukraine. That is, we can talk about some progress in strengthening the economic situation of the regions in general on several indicators studied. The positive direction of the vector indicates that, in general, most indicators show positive changes in the direction of economic growth. The most considerable length of the vector in the Mykolaivska region testifies that in the area on several economic indicators, higher results are reached than in other areas of the Black Sea region and, on average, in other regions of Ukraine during the investigated period.

References

[1] M. V. Vishivanyuk, Methodical approaches to the assessment of sustainable development of regions. *Investments: practice and experience*, Vol. 23, (2012), pp. 147-149.

[2] S. M. Stupchuk & V. O. Labunets, The level of competitiveness of the Black Sea region

of Ukraine in the context of globalization and European integration of world processes, Black Sea *Economic Studies*, Vol. 28-2, (2018), pp. 53-57.

[3] O. Melikh, et al., Organizational and economic fundamentals of development of sports tourism in the system of management of sports and health activities. *Baltic Journal of Economic Studies : the scientific journal,* Vol. 5, No. 5, (2019), pp. 79-83.

[4] O. Vyshnevska, et al., Infrastructure provision of the agrarian market in the globalized environment. *Baltic Journal of Economic Studies : the scientific journal,* Vol. 5, (2019), pp. 39-46.

[5] State Statistics Service of Ukraine (2021).

[6] L. A. Kostyrko and N. Yu. Valentychyk, Methodical bases of the complex analysis of financial stability of local budgets. *Financial space,*. Vol. 1, No. 21, (2016), pp. 83-90.

[7] M. M. Stavnich, Budget security of the region in the context of effective socio-economic development. *Collection of scientific works of the National University of the State Tax Service of Ukraine,* Vol. 1, (2012), pp. 386-394.

[8] Budget of Ukraine Statistical collection. Ministry of Finance of Ukraine, (2016).

[9] Budget of Ukraine. Statistical collection. Ministry of Finance of Ukraine, (2019).

[10] G. V. Wozniak, Advantages and risks of budget decentralization: theoretical and methodological aspects, *Problems of economics*, Vol. 2, (2015), pp.253-257.

[11] N. Popadynets, et al., Evaluation of Domestic Market Development in Ukraine. In: Russo D., Ahram T., Karwowski W., Di Bucchianico G., Taiar R. (eds) Intelligent Human Systems Integration 2021. IHSI 2021. Advances in Intelligent Systems and Computing, Vol. 1322, (2021).

[12] T. M. Kryshtal, K. Lagler and O. G. Pidvalna, Investment potential of the region as a basis for ensuring its sustainable development. *Scientific Bulletin of Poltava University of Economics and Trade,* Vol. 5, No. 90, (2018), pp. 13-18.

[13] O. Pryshchepa, et al., Optimization of multi-channel queuing systems with a single retail attempt: Economic approach. *Decision Science Letters,* Vol. 4, No. 5, (2020), pp. 559-564.

[14] Guide to research and innovation strategy for smart specialization.

[15] I. Irtyshcheva, et al., Efficiency of Decentralization as an Important Instrument of Ukraine's Socio-Economic Development. *International Journal of Industrial Engineering and Production Research*, Vol. 33, No. 1, (2022).

[16] World Economic Situation and Prospects: December 2022 Briefing, No., available at: 167https://www.un.org/development/desa/dpad/publication/world-economic-situation-and-prospects-december-2022-briefing-no-167/

[17] Monitoring economic, social and cultural rights Manual on Human Rights Monitoring. (2011), p. 48.

Follow this article at the following site:

Inna Irtyshcheva, Olena Pavlenko, Yevheniia Boiko, Iryna Kramarenko, Kseniia Chumakova, Natalia Hryshyna, Olena Ishchenko & Anastasiia Zubko. Economic Monitoring of Transformation Processes: National Realities and Foreign. IJIEPR 2023; 34 (1) :1-11
URL: http://ijiepr.iust.ac.ir/article-1-1514-en.html