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Efficiency of managing regional economic development in wartime (Ukrainian experience)

Eficacia de la gestión del desarrollo económico regional en tiempos de guerra (experiencia ucraniana)

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Abstract

Each state has its own regional peculiarities, just as each state should take all possible measures to ensure the uniform and efficient economic development of each of its regions, in accordance with the existing potential and the infrastructure already in place. In order to develop measures for effective management of the economic development of regions, it is necessary to conduct a retrospective analysis of statistical data, which will allow to identify the peculiarities of their current financial condition and group them by the degree of development. Accordingly, the purpose of the study is to determine the optimal approaches to ensuring the effectiveness of regional economic development management, taking into account the martial law in Ukraine.

The performance of regional enterprises, investment volumes and output are largely

Resumen

Cada estado tiene sus propias peculiaridades regionales, del mismo modo que cada estado debe tomar todas las medidas posibles para garantizar el desarrollo económico uniforme y eficaz de cada una de sus regiones, de acuerdo con el potencial existente y la infraestructura ya creada. Con el fin de elaborar medidas para una gestión eficaz del desarrollo económico de las regiones, es necesario realizar un análisis retrospectivo de los datos estadísticos, que permita identificar las peculiaridades de su situación financiera actual y agruparlas según su grado de desarrollo. En consecuencia, el propósito del estudio es determinar los enfoques óptimos para garantizar la eficacia de la gestión del desarrollo económico regional, teniendo en cuenta la ley marcial en Ucrania.

El rendimiento de las empresas regionales, los volúmenes de inversión y la producción están

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determined by market mechanisms and incentives that support concentration processes and lead to the growth of spatial disparities within Ukraine. The uneven development of regions, especially under martial law, may exacerbate social and demographic problems, which will complicate economic recovery after the end of hostilities.

The study identified the main directions of regional development, according to their belonging to a particular cluster, and formulated recommendations aimed at improving the economic efficiency of the regions.

Keywords: regional development, capital investments, regional economy, gross regional product, development potential.

Introduction

Uniform development of the country's regions is the key to the effective realization of the potential of the entire country. Accordingly, the state faces an important task of ensuring sustainable development of the regions, considering their geographical, financial and production specifics. Since the outbreak of a full-scale war in Ukraine, none of the regions has been spared from fighting or destruction because of missile attacks, energy infrastructure has been significantly damaged, and in some regions entire cities have been destroyed and production has been halted. Nevertheless, the State continues to function and ensure the development of the regions, and accordingly, there is a need to determine the optimal approaches to ensuring the effectiveness of regional economic development management in wartime, which can be defined as the **purpose of the article**. In the process of researching the areas of effective management of regional development, it is necessary to take into account the peculiarities of development of each region at the present stage, and for this purpose it is quite logical to use approaches to clustering of Ukrainian regions, according to their financial condition, and to develop specific recommendations for each particular cluster, taking into account its specifics.

Literature Review

The current stage of Ukraine's socio-economic development, which depends on the challenges of military operations and is subordinated to the results of the Ukrainian army at the front, requires a deep understanding of the role of regional development in shaping a unified approach to ensuring the country's sustainable

determinados en gran medida por los mecanismos e incentivos del mercado que apoyan los procesos de concentración y conducen al crecimiento de las disparidades espaciales dentro de Ucrania. El desarrollo desigual de las regiones, especialmente bajo la ley marcial, puede agravar los problemas sociales y demográficos, lo que complicará la recuperación económica tras el fin de las hostilidades.

El estudio identificó las principales direcciones del desarrollo regional, según su pertenencia a un determinado cluster, y formuló recomendaciones encaminadas a mejorar la eficiencia económica de las regiones.

Palabras clave: desarrollo regional, inversiones de capital, economía regional, producto regional bruto, potencial de desarrollo.

development. Today in Ukraine, the issue of uneven regional development is particularly acute, which has become more urgent with the outbreak of full-scale hostilities on the territory of Ukraine. The eastern, southern, and northern regions have suffered significant destruction, the central and western parts of the country have received a significant number of internally displaced persons and have also suffered destruction of infrastructure facilities, and these features should be considered when formulating a development program for each individual region. However, the uneven development of Ukraine's regions was also evident in the pre-war period and was due to the geographical, demographic and social specifics of each of them. Therefore, it is worth focusing on the review of scientific sources that are specifically devoted to the peculiarities of ensuring effective regional development in countries with a heterogeneous structure.

In the scientific literature, the authors mostly emphasize that regional development is the basis for the economic success of the state (Calero & Turner, 2020; Mustafin et al., 2022). At the same time, the government should strive to ensure maximum uniformity of regional development. Of course, this is quite difficult to achieve, especially for large states located on vast territories, but the uniform development of regions should become one of the priorities of state policy in ensuring the sustainable development of administrative units (Rantala & Ukko, 2019).

According to leading scientists (Hendri et al., 2020; FeiBt et al., 2019), the first step towards

diagnosing and further reforming the state of regional development is to conduct an in-depth analysis of statistical data and, if necessary, cluster regions according to the state of their economic and financial development, the amount of investment attracted, and the potential for the development of certain industries. The issues of regional clustering are also described in some detail in the literature (Lin, 2020; Michálková et al., 2023) and allow for the selection of initial data for analysis, as well as the use of the results to develop measures specific to each unique group of regions.

Recommendations for the development of regional activities can be focused primarily on developing a plan to attract investment from private and institutional investors (Kibik et al., 2022; De Propriis & Bailey, 2021), as well as on creating favorable conditions for the development of innovation activity in the regions (Kruszelnicki et al., 2020; Tödting & Trippel, 2018). Innovation activity should not be concentrated in a particular sector or industry, it can be implemented in any area, but is a prerequisite for the timely and comprehensive development of regions.

A separate area of research (Alzyadat & Al-Nsour, 2021; Zhou et al., 2021) is the development of financial management tools at the regional level, as the quality of management decisions made at the local government level determines the region's ability to create favorable conditions for business development and the flow of investment into the region.

The issue of defining indicators of regional development performance and efficiency remains controversial in the literature. Representatives of one group of researchers (Eriksson et al., 2017; Govindarajan, 2019; Saputra et al., 2019) primarily propose to focus on indicators of budget revenues and financial performance of public authorities; others (Henning, 2019; Michálková et al., 2023) focus on the inflow of labor to the region and the availability of tourist flows. It is worth noting that a universal methodological approach to determining the effectiveness of regional development has not yet been presented in the literature and this may be an area for further research.

Methodology

The problem of uneven economic activity in the regions is relevant not only for Ukraine, but also

for the leadership of many countries, as the ability to ensure the effective functioning of the state as a whole largely depends on the well-planned development of the regions. Ukraine has a total area of 603,700 km² and is located in several climatic zones, and the regions have different historical backgrounds and levels of development, resulting in disparities in the development of different regions, which necessitates understanding the specifics of each region's development and the formation of unique areas of economic growth in each of them.

To assess the current development of regions, it is necessary to take into account statistical data in the dynamics, so it is advisable to use the method of statistical analysis (Ahmad et al., 2018; Rauhut et al., 2020). The use of this method will allow to diagnose the problems and potential of each region.

After the statistical analysis, it is logical to move on to grouping the regions by the criterion of their economic status and the volume of GNP generated by a particular region, which can be done using cluster analysis. The use of clustering will allow to develop recommendations for each individual group of regions for their further development.

The study used general scientific methods of analysis, synthesis, generalization, systematization, graphical presentation of material, induction, deduction, comparison and specification, as well as specific methods of statistical and cluster analysis.

Results and Discussion

One of the main indicators that helps to determine the effectiveness of the regional economy is the gross regional product (GRP), which reflects the total value of all goods and services produced in the region. The GRP indicator can be used to assess the development potential of regions and identify leaders in terms of production, since the total value of manufactured products and services can indirectly indicate the availability of jobs and total tax revenues to the state budget from a particular region (Medeiros & Rauhut, 2020; Saputra et al., 2020).

Data on GRP volumes are published by the State Statistics Service of Ukraine (State Statistics Service of Ukraine, 2023), and are illustrated in Fig. 1.

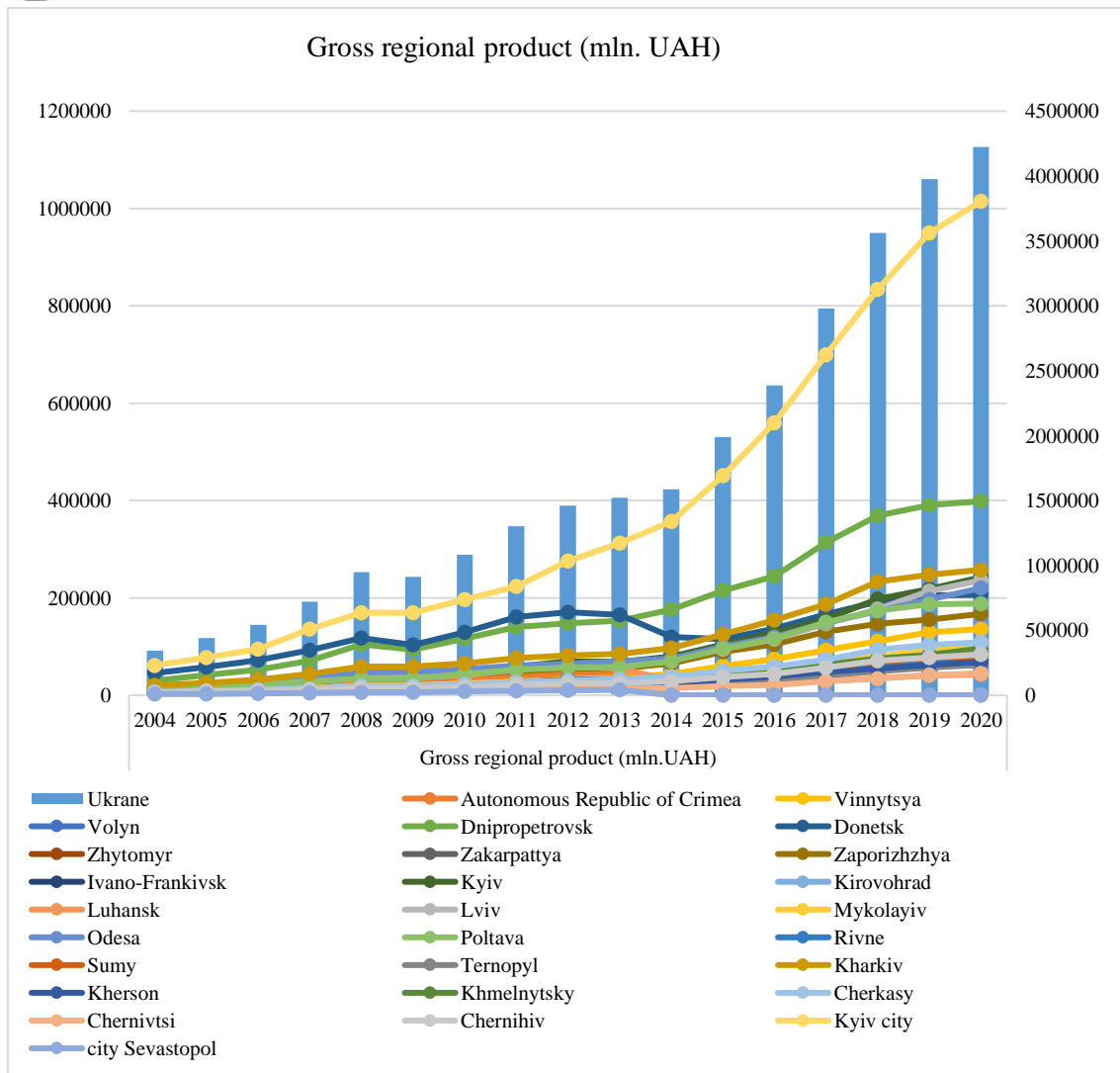


Fig. 1. Gross regional product (mln. UAH)
(Source: State Statistics Service of Ukraine, 2023)

In national currency terms, the GRP is growing steadily, and the inflationary nature of this growth should certainly be taken into account, but inflation is not the only driver of the growth in the value of products manufactured in the regions. Ukraine has been developing international trade and strengthening its position in economic development in the pre-war period, so this growth is an absolute positive characteristic of the entire country. However, it is worth noting that the leader in GRP formation is the city of Kyiv, as the capital, where a significant number of large companies are registered. Concentration of large companies and production facilities in the capital region is a typical situation for a rich country and can be regulated by applying mechanisms of industrial, financial, and economic decentralization.

Dnipropetrovs'k and Donetsk (until 2014) regions also generated significant GRP indicators due to the industrial production concentrated in these areas processing, metallurgical and machine-building plants.

After analyzing the GRP, it is logical to move on to the index of production output (Iammarino et al., 2019), which will allow us to estimate in relative terms the contribution of each region to the total production of goods and services in the entire country - Fig. 2. According to Table 1, it is possible to note that the largest fluctuations in the indices of manufactured products relate to those regions, some of which were occupied in 2014-2015, and, accordingly, production facilities were in the territory not controlled by Ukraine.

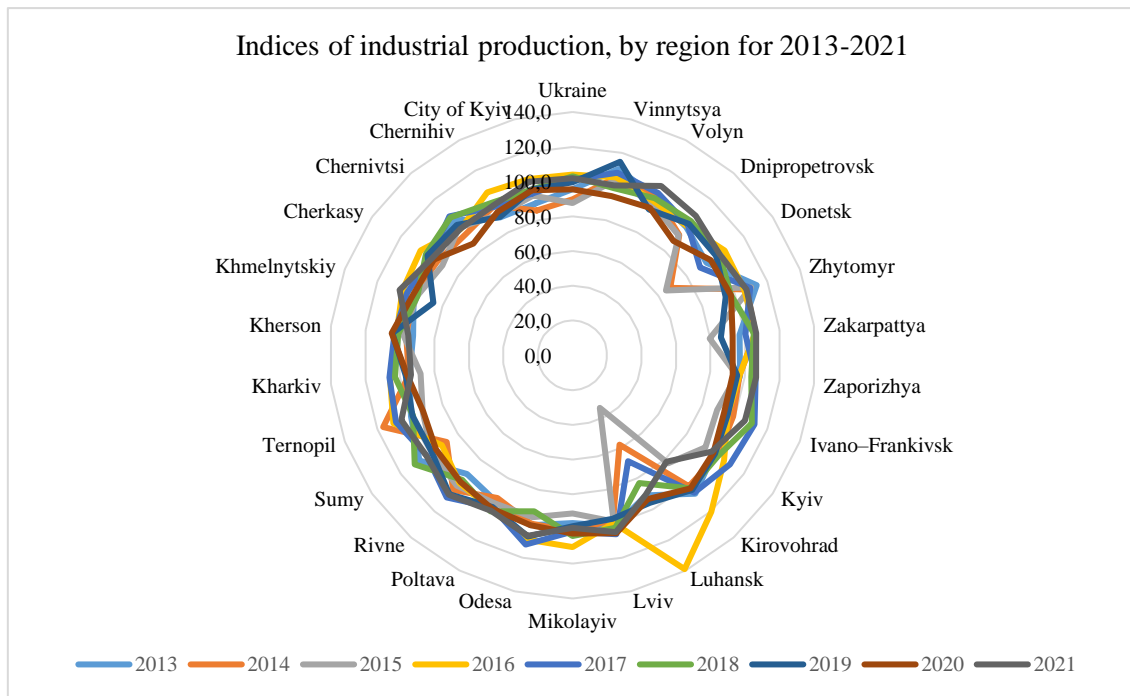


Fig. 2. Indices of industrial production, by region for 2013-2021
(Source: State Statistics Service of Ukraine, 2023)

If we focus on the effectiveness of regional development, we should emphasize the financial performance of those enterprises (Fang et al., 2023; Balland et al., 2019) that are concentrated in the regions. Information on the positive and negative financial results of Ukrainian business entities by region is presented in Fig. 3. According to regional statistics, we see that the highest financial performance indicators are generated by enterprises in Kyiv, Dnipropetrovsk, Donetsk, Zaporizhzhia, Kyiv,

Lviv, Poltava, and Kharkiv regions. Accordingly, the leaders in terms of financial performance are also those regions where, as previously shown, the largest number of industrial enterprises is concentrated.

Unfortunately, there are no official statistics on this indicator with information for 2022-2023, so it is impossible to determine how the full-scale hostilities on the territory of Ukraine affected regional development.

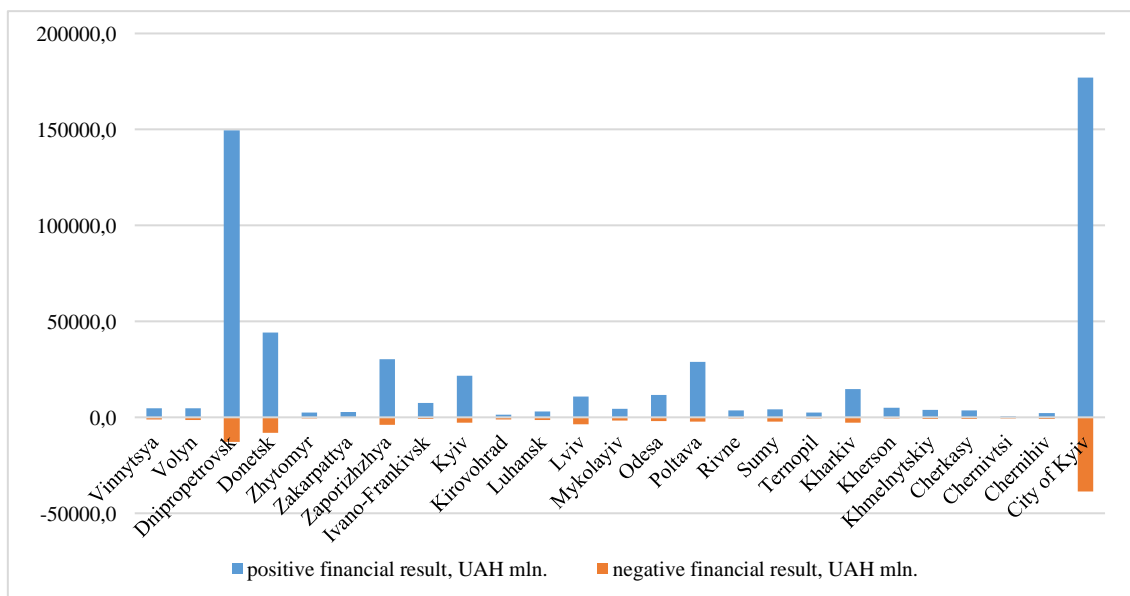


Fig. 3. Net profit (loss) of large and medium-sized enterprises by regions, January-September 2021 (source: State Statistics Service of Ukraine, 2023)

In addition to the financial performance of enterprises concentrated in the region, an important reflection of the effectiveness of their

economic development is the amount of capital investment (Bezverkhyi et al., 2019; Elvekrok et al., 2022) attracted to each region (Fig. 4).

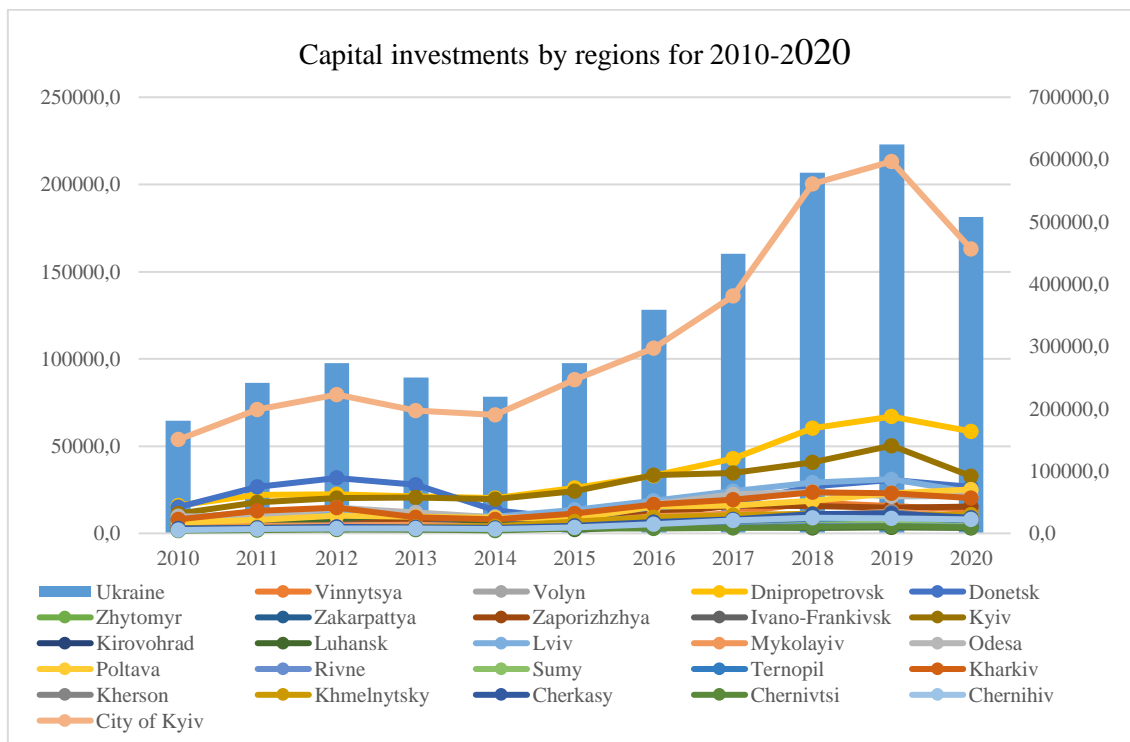


Fig. 4. Capital investments by regions for 2010-2020, mln. UAH (Source: State Statistics Service of Ukraine, 2023)

Official statistics on the volume of capital investment in the regions also ends with data for 2020, but it is indicative in the context that the COVID-19 pandemic has significantly affected investment processes in all regions. In analyzing the dynamics, it is worth noting that after the change in Ukraine's political course in 2014, the volume of capital investment in all regions increased, with Kyiv, Dnipro, Kyiv, Lviv, Poltava, and Kharkiv regions acting as leaders, as well as other indicators.

In general, based on the analysis of statistics, it can be argued that there is a certain shift in the vector of development and efficiency of the regions to the east of Ukraine, while the western regions function less efficiently as a result of their historical and climatic predisposition to agriculture and population outflow.

Given the uneven development of Ukraine's regions, which is substantiated by the analysis of statistical data, it is worth noting that it is

impossible to develop a universal approach to the effective development of any region, it is necessary to take into account their specifics and features, which can be done by clustering the regions of Ukraine by indicators of their development efficiency. It is optimal to use two indicators of the effectiveness of economic development of Ukrainian regions, namely: gross regional product and the volume of capital investment in the region (Diebolt & Hippe, 2019; MacKinnon et al., 2019; Wu & Dong, 2022).

The results of the cluster analysis are shown in Fig. 5. The results of the cluster analysis show that Kyiv and Dnipro region form two separate clusters. This is quite expected, since the statistical data analyzed in the article also confirmed the existence of significant differences between these regions. The results of the cluster analysis and recommendations for ensuring the effectiveness of regional economic development management are presented in Table 1.

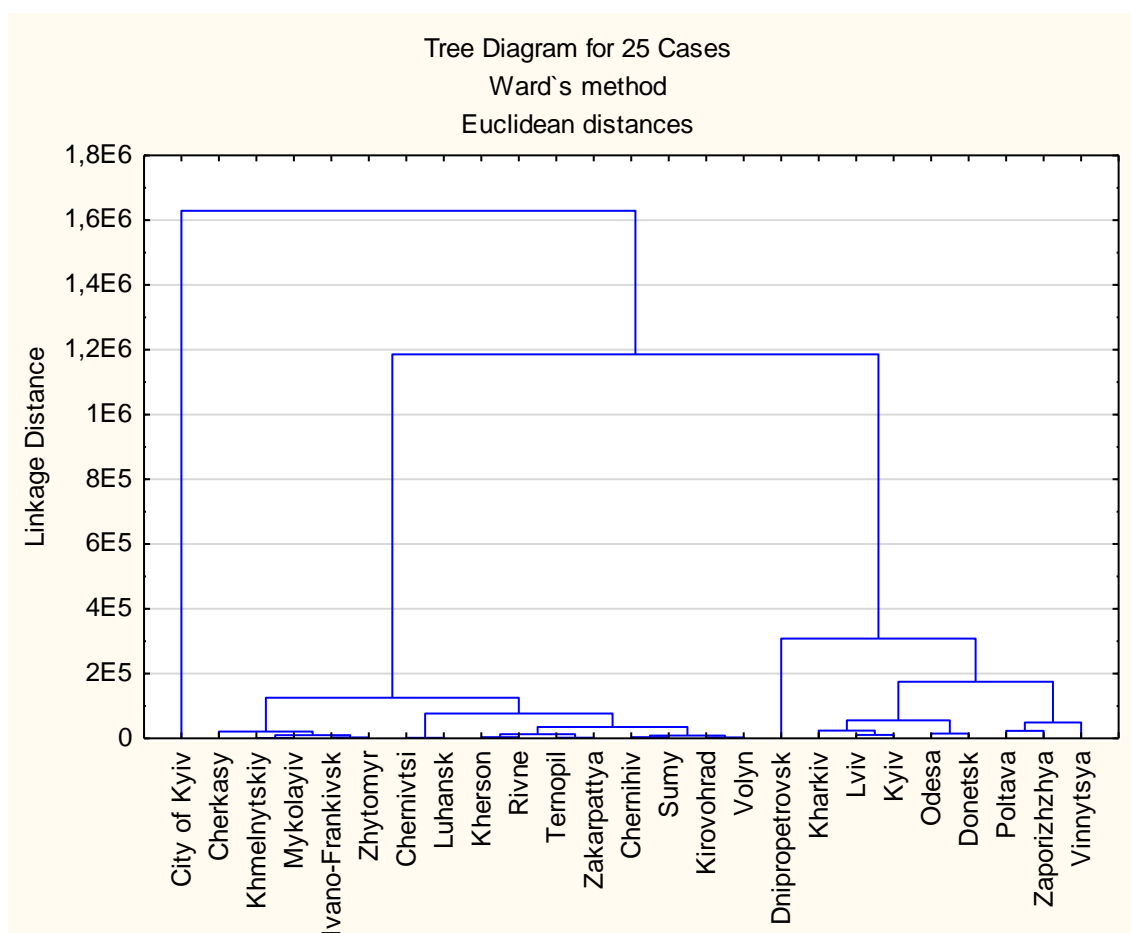


Fig. 5. Results of clustering of Ukrainian regions by capital investment and GRP in 2021 (Source: compiled by the author)

Table 1.

Results of the cluster analysis and recommendations for ensuring the effectiveness of regional economic development management

Name of the cluster and its characteristics	Composition of the cluster	Recommendations for ensuring the effectiveness of economic development management in the cluster regions
Capital cluster. It is represented exclusively by Kyiv and has the specifics of development inherent in the capital. It has the greatest development potential and has already achieved high performance indicators in the region's economic development	Kyiv	The development of the region should focus on financing innovative projects, investing in ambitious projects that can improve Ukraine's international rankings and increase investment flows. Intensive technology development is recommended for the cluster
Trade and production cluster. Dnipro region, which makes up the cluster, combines high trade and production potential due to its favorable geographical location. The region is home to large manufacturing enterprises and is also home to innovative and investment-oriented companies	Dnipro region	The economic development of the cluster should focus on supporting the existing business infrastructure and encouraging its renewal and improvement. It is important for manufacturing enterprises to attract investment in the introduction of innovative production technologies and resource conservation. The renewal of fixed assets of manufacturing enterprises remains relevant, as most of them were created in Soviet times

Industrial and scientific cluster. It has high development potential and resources available for this purpose	Kharkiv, Lviv, Kyiv, Odesa, Donetsk regions	Most of the cluster's regions are characterized by a combination of research centers, strong educational institutions, and production of various types of products and services. The cluster can be characterized as having an above-average development potential and requiring state support to develop its existing potential
A cluster with an average level of development. Has development potential, but without strong innovative production	Poltava, Zaporizhzhia, Vinnytsia regions	The cluster's regions can be called satellites of more developed regions, but they also have their own production facilities and intellectual potential. The cluster needs more attention from the government and programs aimed at industrial and economic development.
A cluster with a below-average level of development. It has potential, but it is underdeveloped, with no significant production centers or infrastructure facilities concentrated in the cluster's regions	Luhansk, Kherson, Rivne, Ternopil, Zakarpattia, Chernihiv, Sumy, Kirovohrad, Volyn regions	The cluster regions can be characterized as requiring increased attention from the state, in particular, a program should be developed to find optimal development vectors for the regions that will take into account the strengths of each region
A cluster with a low level of development. Due to geographical features, the cluster's regions have low economic potential, but significant tourism potential.	Cherkasy, Khmelnytsky, Mykolaiv, Ivano-Frankivsk, Zhytomyr, Chernivtsi regions	There is no large-scale production in the cluster areas, but there are opportunities for infrastructure and tourism development

(Source: compiled by the author)

The cluster analysis showed that the regions of Ukraine are significantly different and have their own specifics, which should be considered when planning effective economic development measures. It is important to take into account the degree of destruction caused by the hostilities in each region, which will help identify those areas that require the most attention and the most significant inflow of investment, including from outside the country.

Of course, it is impossible to ensure absolutely uniform development of each region, but taking into account the specifics of each region, it is possible to determine the priorities for realizing economic potential and efficient use of available financial, human, energy, material, intellectual, and investment resources.

Conclusions

In the course of the study, the goal was achieved, namely, to determine the optimal approaches to ensuring the effectiveness of regional economic development management, taking into account their current state and prospects for post-war recovery. This was achieved by analyzing statistical data and key indicators of the development of Ukrainian regions. The analysis showed that the most economically powerful administrative-territorial unit is Kyiv. Kyiv, where the majority of legal entities are

concentrated, and therefore most investments are attracted here. The importance and significant impact of Dnipropetrovs'k, Poltava, and Kharkiv regions on the economic situation in the country is also highlighted. Further, as a result of the cluster analysis, a group of regions was identified, characterized, and recommendations for their economic development were formulated. The following clusters were identified because of the cluster analysis:

the capital clusters. It is represented exclusively by Kyiv and has the specifics of development inherent in the capital. It has the greatest development potential and has already achieved high performance indicators in the region's economic development trade and production cluster. Dnipro region which makes up the cluster, combines high trade and production potential due to its favorable geographical location. The region is home to large manufacturing enterprises and is also home to innovative and investment-oriented companies industrial and scientific cluster. It has high development potential and resources available for this purpose a cluster with an average level of development. It has development potential, but without strong innovative production a cluster with a below-average level of development. It has potential, but it is underdeveloped, with no significant production centers or infrastructure facilities concentrated in the cluster's regions a

cluster with a low level of development. Due to geographical features, the cluster's regions have low economic potential, but a significant tourist.

It is worth emphasizing that the task of the state is not to provide funding for each individual region, but rather to identify the strengths of each region and make efforts to ensure that these strengths are developed.

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