

DOI: 10.55643/fcaptp.1.48.2023.3975

Tetiana Mayorova

D.Sc. in Economics, Professor of Corporate Finance and Controlling Department, Kyiv National Economic University named after Vadym Hetman, Kyiv, Ukraine;

e-mail: mayorova@kneu.edu.ua

ORCID: [0000-0001-9153-8460](https://orcid.org/0000-0001-9153-8460)

(Corresponding author)

Iryna Tymoshenko

Candidate of Economic Science, Associate Professor of Corporate Finance and Controlling Department, Kyiv National Economic University named after Vadym Hetman, Kyiv, Ukraine;

ORCID: [0000-0001-7885-3685](https://orcid.org/0000-0001-7885-3685)

Svitlana Urvantseva

Candidate of Economic Science, Associate Professor of Corporate Finance and Controlling Department, Kyiv National Economic University named after Vadym Hetman, Kyiv, Ukraine;

ORCID: [0000-0002-0632-0190](https://orcid.org/0000-0002-0632-0190)

Roman Chernyak

PhD Student, Kyiv National Economic University named after Vadym Hetman, Kyiv, Ukraine;

ORCID: [0000-0002-5918-1024](https://orcid.org/0000-0002-5918-1024)

Pavlo Lutsiv

PhD Student, Kyiv National Economic University named after Vadym Hetman, Kyiv, Ukraine;

ORCID: [0000-0001-8803-8422](https://orcid.org/0000-0001-8803-8422)

Received: 02/02/2023

Accepted: 12/02/2023

Published: 28/02/2023

© Copyright
2022 by the author(s)



This is an Open Access article distributed under the terms of the [Creative Commons CC-BY 4.0](https://creativecommons.org/licenses/by/4.0/)

CLUSTER APPROACH IN ASSESSING THE PRE-WAR LEVEL OF FINANCIAL INCLUSION OF POPULATION FROM DIFFERENT REGIONS OF UKRAINE IN THE MARKET OF BANK LOAN

ABSTRACT

The problem of financial inclusion of the population is relevant in developing countries, including Ukraine. Analysis of the state of financial inclusion demonstrated a fairly low level of financial services provided to Ukrainians. The purpose of the article is to assess the level of financial inclusion of households in the regions of Ukraine in the market of bank loans in the pre-war period using cluster analysis tools and justify the possibility of their application for the formation of an effective state-regional policy for the restoration and development of the affected territories, in particular, in the context of ensuring access to bank loans. Cluster analysis was the methodological tool of the study. An algorithm of clustering of regions of Ukraine by the level of financial inclusion of the population in the market of bank loans was designed, taking into account such indicators as the number of bank branches, amount of a loan for one person, interest rates on loans to individuals in the regions. As a result of cluster analysis, four clusters were formed with low, middle, high and advanced-level regions by the level of financial inclusion of the population in the market of bank loans. Most Ukrainian regions (15) were determined as having a low level of access to the market of bank loans. This made it possible to conclude that these regions need special attention from the central and local authorities, as well as from financial institutions in terms of facilitation of public access to banking services. The need to strengthen the financial inclusion of the population in Ukraine during martial law and in the post-war period, taking into account the needs of de-occupied and front-line territories, as well as regions with a large number of internally displaced persons, is substantiated.

Keywords: financial inclusion, household finances, bank loan, financial market, interest rate on the bank loan, cluster analysis, Ward's method, regional economy

JEL Classification: G02, G21, G28, C38

INTRODUCTION

Global financial institutions, including Alliance for Financial Inclusion [1], the Center for Financial Inclusion [2], the Global Partnership for Financial Inclusion [20], and others recognize that the financial inclusion of the population, through which everyone can get free access to financial services, contributes to their well-being and plays an important role in the country's achievement of the Sustainable Development Goals [24]. The World Bank Group presumes that financial inclusion is the key factor in reducing poverty and helping any country to prosper. The initiative of the World Bank Group UFA2020 stipulates that adults around the world - both women and men - should have access to a transaction account or electronic tool for saving money, sending payments and receiving deposits as the main prerequisite for managing their financial lives [25]. After all, according to the latest data from The Global Findex database, about a third of the world's adult population, which is 1.7 billion, still do not use financial services, including banking services [26].

The issues of financial inclusion in Ukraine are also extremely important. At the Second International Forum on Financial Inclusion, the National Bank of Ukraine identified financial inclusion as one of its strategic goals [21]. In addition, the National Bank of

Ukraine has agreed with the International Finance Corporation about technical assistance for Ukraine's Financial Inclusion for Growth Program [23].

Governments and central banks of developed countries are also increasingly emphasizing the development of financial inclusion in their policy documents. Moreover, the G20 leaders during the summit in Riyadh in November 2020 emphasized the importance of restoring financial inclusion, primarily in the form of digital payments, against the background of the strengthening of the COVID-19 pandemic [19]. As a result, already in 2021, in developing countries, the processes of using financial services remotely via the Internet have dramatically accelerated. In India, for example, more than 80 million adults made their first digital financial payment during the pandemic. In China, more than 100 million adults (or 11%) have done so for the first time since the start of the pandemic. Similarly, in Ukraine, due to quarantine restrictions, the number of bank accounts among the adult population of Ukraine (over 15 years old) increased from 63% in 2017 to 84% in 2021 [28].

Unfortunately, the COVID-19 pandemic in 2019-2021, as well as the martial law in Ukraine in 2022, have intensified crisis phenomena, including in the financial, economic and social spheres. In 2022, the Ministry of Economy of Ukraine predicts a slowdown in GDP growth to 33.2% and an inflation rate of more than 30%. Almost 1 million people in Ukraine lost their jobs due to the war, 1.5 million of the employed left abroad, and about 600,000 individuals - entrepreneurs reduced their activities [10]. The access of households in the de-occupied territories of Ukraine to basic financial services, in particular, to bank loans, has been significantly limited. The low level of financial awareness of the population of de-occupied settlements and internally displaced persons makes it impossible for households to use financial services, including state grants and bank loans.

The need to increase the level of financial inclusion in Ukraine during the period of martial law was stated by the Government of Ukraine in the draft Plan for the Recovery of Ukraine, presented at a conference in Lugano (Switzerland) in July 2022 [28].

In view of this situation, there is a need to study the level of financial inclusion in Ukraine in the pre-war period, in particular, in terms of the accessibility of the population of Ukraine to bank loans in the regional section. This will form a scientific basis for the further determination of ways to improve the financial inclusion of households under martial law conditions, and will also allow to provide proposals for choosing directions and tools for improving the financial condition of, first of all, internally displaced persons and persons living in the de-occupied territories, in order to form sufficient investment capital for the potential for the development of individual entrepreneurship and restoration of destroyed property.

LITERATURE REVIEW

The issue of financial inclusion has always been in the field of view of scholars. However, special attention is paid to the issue along with the rapid spread of digital technologies in this area J. Frost, L. Gambacorta and H. Song Shin (2021) [3]. Other scholars study the problems of financial inclusion in the context of blockchain, and digital finance David Lee, Kuo Chuen and Robert Deng (2017) [8].

Peculiarities of financial inclusion in the regional aspect, in particular, on the African continent are studied by Grohmann et al. Grohmann, Antonia & Klühs, Theres & Menkhoff, Lukas (2018) [5]. According to empirical research, researchers have shown that financial inclusion has a positive effect on per-capita GDP growth, and is negatively related to government borrowing. The high public debt-to-GDP ratio observed in most African countries is hampering efforts to achieve financial inclusion.

The authors Angela Kuznyetsova, Iryna Boiarko, Myroslava Khutorna and Yuliia Zhezherun (2022) [18] investigated the peculiarities of the development of financial inclusion cross-country analysis taking into account different models of the financial system and economy levels of development. It was established that the weaknesses of financial inclusion in Ukraine are a seven-fold gap between the assets of banks and non-bank financial institutions and 37% adult population without banking services. In addition, there is a significant gap between the levels of readiness of human capital and information security of digitalization of banks in comparison with EU banks - 2.5 and 1.3 times, respectively, and a critically high level of mistrust banks (70%) with a fairly high share of payment program users (58%).

R. Gutierrez-Romero and M. Ahamed (2021) are also exploring financial inclusion in COVID-19. According to their forecasts, by the end of 2021, the world's population living on less than \$ 5.5 a day will increase by 231 million people, of whom almost 108 million people will face extreme poverty, living on less than \$ 1.90 a day. However, urgent improvements in financial inclusion can significantly reduce the impact on poverty [6].

The economic basis of financial inclusion as an indicator of the availability of financial services for the population has also been thoroughly studied in the works of Ukrainian scientists S. Naumenkova (2015, 2019), S. Mishchenko and D. Dorofeiev (2019) [11, 12], Financial inclusion as a tool to increase the level of financial sovereignty of the state and stabilize the state of its financial security is considered by Z. Zhyvko and N. Zachosova (2019) [28].

Despite a fairly thorough study of financial inclusion by foreign and domestic scholars, little attention is paid to the regional aspect of this issue within the country. For example, the regions of Ukraine are characterized by different rates of socio-economic development. Therefore, there is a reason to believe that the accessibility of financial services, especially bank loans, to households in the regions of Ukraine, is also different. It will differ even more in the case of a repeated study in the post-war period, taking into account the level of destruction and damage to the territories, their transformation under occupation. In view of this, there is a need to study the features of financial inclusion of households in the regions of Ukraine in the market of bank loans in the pre-war period. In order to assess financial inclusion, we consider it appropriate to use cluster analysis tools.

Today, cluster analysis is often used by scientists to classify regions or territories on various grounds, with this statement being true for both foreign research and the work of domestic scientists. For example, Ie. Opmane (2013) used cluster analysis tools to study differences in economic development indicators between regions of Latvia [13]. A team of scientists consisting of Gavurova et al. (2017) not only clustered the territories of the Slovak Republic according to their level of economic competitiveness but also proposed changes to the regional policy of the state based on the results of the study [4]. Other authors used cluster analysis to evaluate the socioeconomic development level and management in the Guangxi region of China (Zongkeng et al. (2021)) [9].

The analysis of these scientific works has shown that cluster analysis can be an effective tool in the multifactor classification of regions and territories, which creates preconditions for the formation of a statistically and mathematically sound policy of their transformation in accordance with identified needs. In particular, such a policy may be aimed at modifying the economic behaviour of households, but in Ukraine, there are not many studies based on the described methodology. It is worth mentioning the work of Sydorova et al. (2020), who conducted a cluster analysis of household expenditures in Ukraine and Poland in order to compare them [17]. At the same time, the authors carry out classification on the basis of the k-means method not in terms of the regions of the studied countries, but in terms of the categories of population needs - basic and secondary ones. The closest to the topic of the proactiveness of households in the financial market is the study of L. Shkvarchuk and R. Slavyuk (2020), who studied in their work the demand of these economic entities for financial services in the regional context [15]. At the same time, like previous authors, they used the k-means method and the clustering itself was based on the volume of financial services consumed per household in 2017-2018. Giving credit to the scientific achievements of the authors, we would like to note that they only state the identified dependencies and results of a grouping of regions of Ukraine on the basis of research, but do not further develop an idea of how these results can be used to develop specific measures to stimulate financial demand.

Thus, the above allows us to state that cluster analysis can potentially be used to classify the regions of Ukraine in order to assess the level of financial inclusion of households in the market of bank loans. As the study of the works of domestic and foreign scholars has shown, the topic of financial inclusion of the population is relevant, in particular in the context of the interest in lending products, but at the same time is virtually not explored with the help of clustering tools. Given the above, as well as the impact of COVID-19 and hostilities in Ukraine on financial markets and the financial capacity of households, we see the need to deepen the chosen research topic.

AIMS AND OBJECTIVES

The purpose of the article is to assess the level of financial inclusion of households in the regions of Ukraine in the market of bank loans in the pre-war period using cluster analysis tools and justify the possibility of their application for the formation of an effective state-regional policy for the restoration and development of the affected territories, in particular, in the context of ensuring access to bank loans.

The purpose of the study will be achieved in the process of performing the following tasks: 1) development of an algorithm for clustering the regions of Ukraine according to the level of financial inclusion of the population in the market of bank loans; 2) selection of macroeconomic indicators that characterize the level of provision of bank loans to households in the regions of Ukraine; 3) conducting a cluster analysis of the regions of Ukraine according to the level of financial inclusion of the population in the market of bank loans in the pre-war period; 4) assessment of possible changes in clusters caused by the state of war and the consequences of military actions in certain territories; 5) substantiating the potential of cluster analysis for differentiating the regions of Ukraine according to the level of financial inclusion in the post-war period with

the aim of developing a state regional policy for the reconstruction and development of the affected territories, in particular, in the context of facilitating access to the bank lending market.

METHODS

Cluster analysis as a multi-instrumental method of classification of multidimensional objects has a powerful potential in performing statistical studies of various phenomena and processes, including economic ones. Cluster analysis was first used in the study of economic processes and phenomena in the 1930s. First proposed by English mathematician Robert Trion in 1939, it demonstrated its effectiveness in analyzing the qualitative and quantitative parameters of objects in the economic sphere.

The choice of a cluster analysis methodology for assessing the level of financial inclusion of households in the market of bank loans can be justified by a number of its advantages:

- allows to break multidimensional data series at once under the whole set of factor signs (access of the population to bank loans is defined not by one, but by several factors);
- data of almost any nature can be considered, as there is no restriction on the type of studied objects (this will allow to include factors having different dimensions in the model);
- allows you to process a large array of data, sharply compress them, and make them compact and clear;
- can be applied cyclically (carried out until the desired result is achieved, and after each cycle, there may be a significant change in the direction of further research).

In the context of our study, the application of the method of cluster analysis requires compliance with a certain algorithm of actions, Figure 1:

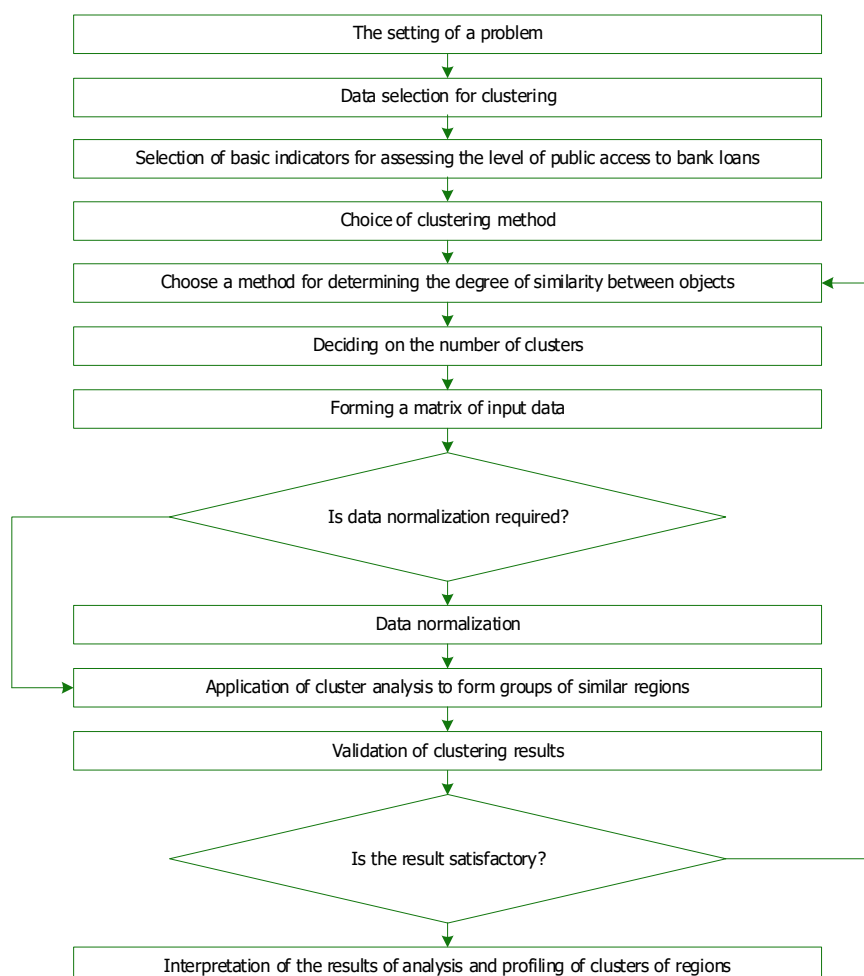


Figure 1. Algorithm of clustering of regions of Ukraine by the level of financial inclusion of the population in the market of bank loans.

According to the above algorithm, the first task to be solved is to determine the level of access of the population to bank loans in the regions of Ukraine on the basis of a number of quantitative indicators. We included 24 regions of Ukraine in the sample of cluster analysis (with the exception of the temporarily occupied Autonomous Republic of Crimea). The city of Kyiv and the Kyiv Oblast are regarded in the sample as one region.

RESULTS

To characterize the level of financial inclusion of the population in the market of bank loans, three indicators were selected in 2021 for each of the regions: the amount of loan granted to one person, the loan rate and the number of banking institutions. Of particular interest to us is, above all, the first of the indicators, as it best reflects the differentiation in the ability of the population of different areas to receive a loan. As can be seen from Table 1, in 2017-2019 there was an increase in the average size of loans received by one person. It should be noted that the increase was due to an increase in the volumes of lending provided to households as a whole, as the population either remained virtually unchanged or decreased. And although, in 2020 the trend changed (the indicator became lower than that in 2018, amounting to UAH 3,441.66), in 2021, the average volume of loans per person increased to UAH 4435.27.

Table 1. The amount of loans granted by commercial banks to households per capita by regions of Ukraine in 2017-2021, UAH. (Source: compiled by the authors according to [16; 22])

Region of Ukraine	2017	2018	2019	2020	2021
Vinnitsia	2296.95	2692.90	2823.28	2597.45	3378.57
Volyn	2490.80	2851.20	2806.86	2455.48	3262.33
Dnipropetrovsk	5936.92	6617.04	6699.62	6180.52	7475.25
Donetsk	2550.44	2692.03	2153.01	965.71	1279.02
Zhytomyr	2537.12	2887.31	2887.25	2526.50	3362.08
Zakarpattia	2999.92	2974.96	2730.80	2520.25	3047.87
Zaporizhzhia	3430.95	3919.44	4016.81	3545.83	4504.22
Ivano-Frankivsk	2094.41	2375.36	2498.88	2132.26	2968.59
The city of Kyiv and the Kyiv Oblast	11794.14	14983.83	18801.65	19734.96	25750.41
Kirovograd	2298.00	2764.88	3046.07	2922.86	3643.86
Luhansk	2117.57	2283.28	1963.53	459.81	594.41
Lviv	3055.69	3535.75	3998.44	3693.31	4935.16
Mykolaiv	3425.36	4032.95	3767.77	3629.63	4410.98
Odesa	5636.87	5631.12	3921.90	3719.11	4329.78
Poltava	2703.95	3309.13	3774.66	3506.10	4448.03
Rivne	2207.05	2389.88	2244.23	1998.80	2793.87
Sumy	2155.00	2598.01	2820.98	2558.77	3355.95
Ternopil	1710.32	1871.28	1693.89	1465.24	2112.14
Kharkiv	3823.65	4274.19	4112.75	3828.53	4965.45
Kherson	3967.90	3879.34	3371.27	2985.12	3606.24
Khmelnitsky	2431.70	2744.14	2701.59	2515.34	3305.59
Cherkasy	2317.28	2646.48	2704.36	2443.88	3242.75
Chernivtsi	2416.69	2673.70	2428.61	2014.77	2659.31
Chernihiv	2065.82	2466.63	2290.46	2199.55	3014.65
Average value	3269.35	3712.28	3760.78	3441.66	4435.27
Minimum value	1710.32	1871.28	1693.89	459.81	594.41
Maximum value	11794.14	14983.83	18801.65	19734.96	25750.41

As for the maximum value of the loan amount per person, the city of Kyiv and the Kyiv Oblast remain the constant and unattainable leaders, where the indicator has been growing since 2018 and is radically different from similar data from other regions of Ukraine. The minimum value of the indicator in 2020 and 2021 was demonstrated by the Luhansk Oblast (and in 2020 its value was the lowest for the studied period - UAH 459.81), and in 2017-2019 – the Ternopil Oblast. Preliminary analysis of these data showed how different the situation is with lending to the population in the regions, which only indicates the need for cluster analysis.

Table 2 shows the data selected for analysis for 2021 in terms of a selection of research objects and indicators (variables). In such a manner, we obtained a two-dimensional matrix of parameters x_{ij} , the size of which is $m \times n$ (24×3), where m is the number of studied regions (oblasts) of Ukraine, n is the number of indicators selected for analysis.

Table 2. The amount of loans granted by commercial banks to households per capita by regions of Ukraine in 2021, UAH. (Source: compiled by the authors according to [16; 22])

№	Region (oblast) (j)	Loan for one person, UAH	Interest rates on new loans, %	Number of banks, pcs.
		X_1	X_2	X_3
1	Vinnitsia	3378.57	32.7	220
2	Volyn	3262.33	32.2	126
3	Dnipropetrovsk	7475.25	32.2	591
4	Donetsk	1279.02	37.5	289
5	Zhytomyr	3362.08	32.5	164
6	Zakarpattia	3047.87	32.9	157
7	Zaporizhzhia	4504.22	34.1	305
8	Ivano-Frankivsk	2968.59	33.3	176
9	The city of Kyiv and the Kyiv Oblast	25750.41	23	1256
10	Kirovograd	3643.86	33.1	152
11	Luhansk	594.41	35.4	93
12	Lviv	4935.16	33	447
13	Mykolaiv	4410.98	34.5	178
14	Odesa	4329.78	33.2	499
15	Poltava	4448.03	32.8	308
16	Rivne	2793.87	31.7	135
17	Sumy	3355.95	32.6	172
18	Ternopil	2112.14	32.8	117
19	Kharkiv	4965.45	32.5	525
20	Kherson	3606.24	33.5	167
21	Khmelnitsky	3305.59	33.2	163
22	Cherkasy	3242.75	32.2	179
23	Chernivtsi	2659.31	32.5	99
24	Chernihiv	3014.65	32.6	162

The reasonability of the selection of such indicators for regional clustering by the level of financial inclusion of the population in the market of bank loans is evidenced by the correlation analysis conducted on their basis by Pearson's zero order criterion (Table 3). We see that Pearson's criterion is close to 1, which indicates a strong relationship between the selected parameters and indicator x_2 "Interest rates on new loans" is inversely related to the other two.

Table 3. Calculation of the correlation based on Pearson's criterion between the indicators of financial inclusion of the population in the market of bank loans in Ukraine in 2021. (Source: calculated by the authors)

Control variables	Loan for one person, UAH	Interest rates on new loans, %	Number of banks, pcs.
Loan for one person, UAH	1,000	-0.962	0.910
Interest rates on new loans, %	-0.962	1,000	-0.890
Number of banks, pcs.	0.910	-0.890	1,000

Moving on through the algorithm from Figure 1, it is necessary to choose the method of cluster analysis, as well as the metrics of the degree of similarity between objects of research. Since we have a small number of objects to form clusters, it is advisable to choose the approach of hierarchical agglomerative clustering, which allows you to gradually combine initial elements, while reducing the number of clusters. Among all the methods used in this approach, we chose Ward's method. Firstly, this method requires the calculation of mean values of individual variables in both clusters for all available observations, after which the squared Euclidean distances from individual observations of each cluster to the cluster mean value are calculated. These distances are summed. Then the clusters that give the smallest increase in the total sum of distances merge into one new cluster. Ward's method allows you to form clusters of approximately equal size, as well as

initially specify their number. The square of Euclidean distances is used as the similarity metrics between objects in this method.

Given the purpose of the research and the need for further interpretation of the results of the analysis, we decided to single out 4 clusters, which will be characterized by the following levels of financial inclusion of the population in the market of bank loans:

- Cluster 1 - low-level regions;
- Cluster 2 - middle-level regions;
- Cluster 3 - high-level regions;
- Cluster 4 – advanced-level regions.

The singling out of the 4th cluster is determined by the hypothesis that the city of Kyiv and the Kyiv Oblast are radically different from other regions of Ukraine in terms of access and popularity of bank loans among households and, therefore, it will expectedly be ascribed to an independent cluster.

According to the algorithm of our progress, we must decide whether it is necessary to carry out the procedure of data normalization which is used if the indicators do not have the same range of values and make it possible to bring all variables to a single range of values. In our case, the selected indicators are measured by different values and, therefore, normalized data will be required during the cluster analysis. The procedure can be carried out by different methods, one of the most popular is z-score method (Klebanova et al. (2018)) [7]. It allows us to go from values x_{ij} to the normalized indicators z_{ij} under the following formula:

$$z_{ij} = \frac{x_{ij} - \bar{x}}{\sigma_x}, \quad (1)$$

where z_{ij} - normalized value for x_{ij} ; x_{ij} - a primary result of the indicators; $\bar{x}$ - arithmetic mean of primary results of the indicators; σ_x - standard deviation of primary results of indicators

After data normalization, you can proceed directly to the application of the Ward's method, which builds a symmetric matrix of distances between regions based on squared Euclidean distances, calculated under the formula:

$$d_{ij}^2 = \sum_{k=1}^n (z_{ik} - z_{jk})^2, \quad (2)$$

where z_{ij} - a normalized value of the j -th object (region) on the i -th indicator; z_{jk} - a normalized value of the k -th object (region) on the j -th indicator; i - the number of the object (region), $i = 1, 2, 3, \dots, n$, where n is the sample size.

Figure 2 presents a matrix of distances, built using IBM SPSS Statistics.

$d(z, z) =$	0	0.41	3.63	1.28	0.36	0.35	0.41	0.22	56.63	0.30	1.04	1.32	1.00	1.43	0.19	0.22	0.25	0.94	1.50	0.39	0.22	0.39	0.47	0.30
	0.41	0	5.44	0.90	0.03	0.01	0.54	0.06	64.74	0.03	0.34	1.80	0.30	2.82	0.99	0.06	0.03	0.16	2.77	0.04	0.03	0.04	0.03	0.04
	3.63	5.44	0	4.86	4.85	5.06	2.67	4.70	35.94	4.87	7.60	1.49	4.98	0.67	2.18	5.20	4.75	6.76	0.64	4.72	4.78	4.81	6.11	4.88
	1.28	0.90	4.86	0	0.67	0.80	0.73	0.66	66.74	1.02	0.84	1.02	0.85	2.38	1.66	0.93	0.81	0.66	2.19	0.87	0.87	0.59	0.07	0.64
	0.36	0.03	4.85	0.67	0	0.01	0.34	0.03	63.46	0.04	0.42	1.39	0.23	2.41	0.83	0.09	0.02	0.19	2.34	0.02	0.03	0.00	0.11	0.01
	0.35	0.01	5.06	0.80	0.01	0	0.42	0.04	63.71	0.02	0.39	1.58	0.28	2.55	0.86	0.06	0.01	0.19	2.50	0.02	0.02	0.02	0.07	0.02
	0.41	0.54	2.67	0.73	0.34	0.42	0	0.36	55.98	0.41	1.38	0.41	0.45	1.10	0.38	0.56	0.36	0.95	1.00	0.32	0.39	0.33	0.80	0.38
	0.22	0.06	4.70	0.66	0.03	0.04	0.36	0	62.76	0.07	0.39	1.38	0.43	2.17	0.68	0.03	0.02	0.26	2.14	0.08	0.02	0.04	0.11	0.01
	56.53	64.74	35.94	66.74	63.46	63.71	55.98	62.76	0	62.26	72.78	51.92	64.22	44.31	50.62	63.51	62.48	70.62	44.95	62.59	62.34	63.66	66.43	63.54
	0.30	0.03	4.87	1.02	0.04	0.02	0.41	0.07	62.26	0	0.54	1.61	0.30	2.48	0.76	0.08	0.02	0.31	2.44	0.02	0.02	0.06	0.09	0.06
	1.04	0.34	7.60	0.84	0.42	0.39	1.38	0.39	72.78	0.54	0	2.82	0.41	4.11	2.01	0.34	0.45	0.10	4.06	0.56	0.45	0.41	0.23	0.35
	1.32	1.80	1.49	1.02	1.39	1.58	0.41	1.38	51.92	1.61	2.82	0	1.40	0.57	0.86	1.79	1.46	2.25	0.41	1.40	1.52	1.33	2.24	1.43
	1.00	0.30	4.98	0.85	0.23	0.28	0.45	0.43	64.22	0.30	0.91	1.40	0	2.94	1.40	0.58	0.33	0.42	2.75	0.17	0.39	0.22	0.51	0.35
	1.43	2.82	0.69	2.38	2.41	2.55	1.10	2.17	44.31	2.48	4.11	0.57	2.94	0	0.65	2.49	2.30	3.72	0.02	2.42	2.31	2.37	3.21	2.34
	0.19	1.00	2.18	1.66	0.83	0.86	0.38	0.69	50.62	0.76	2.01	0.86	1.40	0.65	0	0.77	0.70	1.76	0.72	0.82	0.68	0.85	1.18	0.79
	0.22	0.06	5.20	0.93	0.09	0.06	0.56	0.03	63.51	0.08	0.34	1.79	0.58	2.49	0.77	0	0.04	0.28	2.50	0.14	0.03	0.10	0.06	0.05
	0.25	0.03	4.75	0.81	0.02	0.01	0.36	0.02	62.48	0.02	0.45	1.46	0.33	2.30	0.70	0.04	0	0.26	2.27	0.03	0.00	0.03	0.09	0.01
	0.94	0.16	6.76	0.66	0.19	0.19	0.95	0.26	70.62	0.31	0.10	2.25	0.42	3.72	1.76	0.28	0.26	0	3.61	0.27	0.29	0.18	0.15	0.19
	1.50	2.77	0.64	2.19	2.34	2.50	1.00	2.14	44.95	2.44	4.06	0.41	2.75	0.02	0.72	2.50	2.27	3.61	0	2.35	2.28	2.29	3.20	2.29
	0.39	0.04	4.72	0.83	0.02	0.02	0.32	0.08	62.59	0.02	0.56	1.40	0.17	2.42	0.82	0.14	0.03	0.27	2.35	0	0.05	0.03	0.15	0.05
	0.22	0.03	4.78	0.87	0.03	0.02	0.39	0.02	62.34	0.02	0.45	1.52	0.39	2.31	0.68	0.03	0.00	0.29	2.29	0.05	0	0.04	0.08	0.02
	0.39	0.04	4.81	0.59	0.00	0.02	0.33	0.04	63.66	0.06	0.41	1.33	0.22	2.37	0.85	0.10	0.03	0.18	2.29	0.03	0.04	0	0.13	0.01
	0.47	0.03	6.11	1.07	0.11	0.07	0.80	0.11	66.43	0.09	0.23	2.24	0.51	3.21	1.18	0.06	0.09	0.15	3.20	0.15	0.08	0.13	0	0.09
	0.30	0.04	4.88	0.64	0.01	0.02	0.38	0.01	63.57	0.06	0.35	1.43	0.35	2.34	0.79	0.05	0.01	0.19	2.29	0.05	0.02	0.01	0.09	0

Figure 2. Algorithm of clustering of regions of Ukraine by the level of financial inclusion of the population in the market of bank loans.

With the help of IBM SPSS Statistics, we carried out the cluster analysis of the set parameters within which there was a hierarchical aggregation of objects, the process of which can be schematically shown in the form of the dendrogram (tree-like diagram containing n levels, each of which corresponds to one of the steps of the process of sequential aggregation of clusters) (Klebanova et al. (2018)) [7]. It is presented in Figure 3, where: 1 - Vinnytsia, 2 - Volyn, 3 - Dnipropetrovsk, 4 - Donetsk, 5 - Zhytomyr, 6 - Zakarpattya, 7 - Zaporizhzhia, 8 - Ivano-Frankivsk, 9 - the city of Kyiv and the Kyiv Oblast, 10 - Kirovograd, 11 - Luhansk, 12 - Lviv, 13 - Mykolaiv, 14 - Odesa, 15 - Poltava, 16 - Rivne, 17 - Sumy, 18 - Ternopil, 19 - Kharkiv, 20 - Kherson, 21 - Khmelnytsky, 22 - Cherkasy, 23 - Chernivtsi, 24 – Chernihiv.

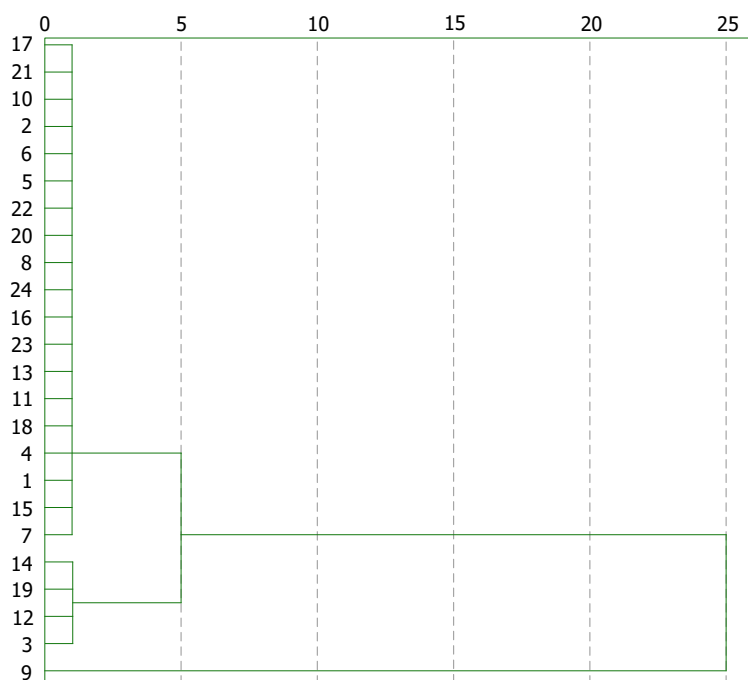


Figure 3. Dendrogram of clusters of regions of Ukraine by the level of financial inclusion of the population in the market of bank loans in 2021.

IBM SPSS Statistics determined the results of the assessment to be reliable, so as a result of Ward's cluster analysis of the regions of Ukraine in order to group them by the level of household access to the bank loan market, the following clusters were formed (Table 4):

Table 4. Clusters of regions of Ukraine by the level of financial inclusion of the population in the market of bank loans in 2021.

	Cluster 1 - low-level regions (L)	Cluster 2 - middle-level regions (M)	Cluster 3 - high-level regions (H)	Cluster 4 – advanced-level regions (A)
Regions	Volyn Zhytomyr Zakarpattya Ivano-Frankivsk Kirovograd Luhansk Mykolaiv Rivne Sumy Ternopil Kherson Khmelnytsky Cherkasy Chernivtsi Chernihiv	Vinnytsia Donetsk Zaporizhzhia Lviv Poltava	Dnipropetrovsk Odesa Kharkiv	The city of Kyiv the Kyiv Oblast

As you can see, the hypothesis that the city of Kyiv and the Kyiv Oblast will be classified as a separate cluster has been confirmed, which is quite justified given the high concentration of population, business, government agencies, banking

institutions and financial infrastructure in this region. Dnipropetrovsk, Odesa and Kharkiv regions expectedly were among the regions with a high level of financial inclusion of the population in the market of bank loans, as the regional centres here are cities with a population of millions, whose potential in meeting the needs of households in banking services is good. The cluster with the average values of the studied indicators included Vinnytsia, Donetsk, Zaporizhzhia, Lviv and Poltava regions, while the group with the worst situation with public access to bank loans was the largest and consists of 15 oblasts.

Using a similar methodology, we conducted a cluster analysis of the regions of Ukraine according to the same indicators in 2017-2021 to track how the composition of regional clusters changed during this period. The results of this study are presented in Table 5.

Table 5. Dynamics of clusters of regions of Ukraine for 2017-2021. (Source: formed by the authors)

Region	2017	2018	2019	2020	2021
Vinnytsia	M	M	M	M	M
Volyn	M	↓ L	L	L	L
Dnipropetrovsk	H	H	H	H	H
Donetsk	L	L	↑ H	↓ L	↑ M
Zhytomyr	L	L	L	L	L
Zakarpattia	M	↓ L	L	L	L
Zaporizhzhia	M	↓ L	↑ H	↓ M	M
Ivano-Frankivsk	M	↓ L	L	L	L
The city of Kyiv and the Kyiv Oblast	A	A	A	A	A
Kirovograd	M	↓ L	L	L	L
Luhansk	L	L	L	L	L
Lviv	H	↓ M	↑ H	↓ M	M
Mykolaiv	M	M	↑ H	↓ L	L
Odesa	H	H	H	↓ M	↑ H
Poltava	M	M	M	M	M
Rivne	L	L	L	L	L
Sumy	L	L	L	L	L
Ternopil	L	L	L	L	L
Kharkiv	H	↓ M	↑ H	↓ M	↑ H
Kherson	M	↓ L	L	L	L
Khmelnitsky	L	L	L	L	L
Cherkasy	M	↓ L	L	L	L
Chernivtsi	L	L	L	L	L
Chernihiv	M	↓ L	L	L	L

As can be seen in Table 5, the largest changes in the composition of clusters took place in 2018, with the changes being mainly related to the relocation of an oblast (region) to a group of oblasts (regions) with a lower level of financial inclusion of population in the market of bank loans. This happened mainly due to the next wave of bank closures (in 2017, 14 banks left the market and 4 banks - in 2018) (The National Bank of Ukraine, 2022). The fewest changes took place in 2019, with the changes being related to the transition of the region to a higher cluster. In 2020, the situation with the movement of regions between clusters worsened again.

Thus, we can conclude that before the war a number of regions of Ukraine have long-standing problems with the inclusion of households in bank lending ignored by both state and local authorities and banks themselves. This gives grounds to speak about the asymmetry of state and regional policy in the field of ensuring financial inclusion and the availability of bank loans for the population. One can observe active events and information campaigns in those regions where there is no such problem (for example, the city of Kyiv and the Kyiv Oblast), while the real need for them exists in other regions (Sumy, Rivne, Luhansk, Ternopil, Chernivtsi, Zhytomyr and other regions from the 4th Cluster).

The low level of financial inclusion in the regions of cluster 4 negatively affected the formation of household income, and therefore their sustainable development and the development of these regions as a whole. This is confirmed by statistical data of the State Statistics Service of Ukraine (Table 6), where the population with a low level of financial inclusion has the lowest income.

Table 6. Disposable income per capita, UAH. (Source: compiled by the authors according to [16])

Region	2017	2018	2019	2020	2021
Ukraine	47270	58442	69140	74688	90036
Vinnitsia	45436	55734	65503	70939	86274
Volyn	38514	46120	53990	57973	70061
Dnipropetrovsk	57333	74755	89042	94804	113085
Donetsk	25278	33840	39843	42219	49217
Zhytomyr	42684	52715	62571	66651	79328
Zakarpattia	33891	41418	47852	52379	60386
Zaporizhzhya	54261	65065	76062	83309	97924
Ivano-Frankivsk	40580	48724	56514	61088	71944
Kyiv	50664	65623	76232	80274	98771
Kirovohrad	42227	50373	58461	64510	76623
Luhansk	16416	21252	24975	27274	32223
Lviv	44981	56592	67353	73092	89441
Mykolayiv	45356	55469	64700	69884	85575
Odesa	50111	63153	75288	82007	96851
Poltava	48663	61649	72843	78813	95770
Rivne	40325	48184	55917	59350	70826
Sumy	45852	55829	65932	71955	87410
Ternopil	36204	43577	50536	55776	67467
Kharkiv	48370	56421	66547	75923	92746
Kherson	41695	50195	58129	63853	76532
Khmelnitskyi	43638	50640	58934	65411	78500
Cherkasy	41854	50600	59626	64852	79621
Chernivtsi	36215	42762	49142	54178	64130
Chernihiv	42501	51213	59972	65815	76777
Kyiv city	118208	143676	173677	182547	225321

Therefore, the conducted research confirms the usefulness and effectiveness of using the cluster approach in assessing the level of financial inclusion of Ukrainian households and can be used to assess other areas of the financial services sector.

DISCUSSION AND CONCLUSION

Based on the theoretical and empirical study, the following conclusions can be drawn.

Financial inclusion is the most important element in empowering the population to make informed decisions when managing its personal finances. Therefore, the main priority of the financial and credit policy of Ukraine for the coming years should be strengthening and improving the quality of financial inclusion of the population in terms of improving access to bank loans at the regional level.

Unlike other countries in the world, Ukraine is characterized by a low level of financial inclusion. To assess the level of public access to bank lending in the regions of Ukraine, cluster analysis was used with such quantitative indicators as the amount of loans per person, interest rates on loans and the number of banks. In the process of assessing the level of financial inclusion of the population of regions of Ukraine in the market of bank loans, it was found that only the city of Kyiv and the Kyiv Oblast have a higher level of financial inclusion, 3 regions (Dnipropetrovsk, Odesa and Kharkiv) have a high level, 5 regions (Vinnitsia, Donetsk, Zaporizhzhia, Lviv, Poltava) have a medium level, and all other 15 regions (oblasts) have a low level of financial inclusion. Moreover, the analysis showed that the problem did not arise recently, but has existed for a long period of time, which indicates the lack of an effective mechanism for the settlement of the problem.

The reason for the low level of financial inclusion in the regions of the 4th Cluster and hence the ways to solve this problem for such regions should be sought in the following.

Firstly, macroeconomic policies require changes that would guarantee an increase in the level of the average income of citizens in problematic regions, the creation of new jobs, as well as the optimal distribution of intergovernmental transfers.

Practice proves that the weaker the general economic situation of a particular area, the fewer opportunities its inhabitants have to receive financial services. Given the foreign experience, notable is the issue of organizing a systematic review of the financial market at the regional level to determine the balance of supply and demand for bank loans for households and their availability to the general public, as well as the introduction of regulatory measures to remove existing barriers to people's access to basic financial services.

Secondly, in Ukraine, the struggle for financial market inclusiveness is sporadic, as evidenced by the results of cluster analysis. Therefore, it will be appropriate to approve at the national level the concept of increasing financial literacy in order to build sustainable public confidence in financial services, improve understanding of modern digital technologies in finance, as well as involve key market players in the development and implementation of such concepts. Moreover, measures within the framework of such a policy should be developed taking into account the regional aspect and carried out in those areas where the problem is most acute. The protection of the rights of consumers of financial services which must be guaranteed by the state will also play an important role in gaining the trust of the population.

Thirdly, banks, for their part, need to transform themselves; given the reluctance to expand the branch network (namely, the lack of access of a number of categories of citizens to bank branches, is one of the determinants of low inclusion) for reasons of economy, they should shift the focus to remote banking. This is especially relevant given the trends of the last two years: the rapid development of fintech, quarantine restrictions due to the COVID-19 pandemic, military action, the need to develop an agency and partner network, and compliance with regulatory and KYC requirements.

While technologically better adaptive young and middle-aged people have already been able to get used to the new living conditions online, most of Ukraine's population (the elderly people) continue to remain outside the banking network. Postal services along with pharmacies, banks and insurance companies continued to operate even during periods of partial and full lockdown in Ukraine during 2020-2021. And, as many domestic retirees receive pension benefits through branches of the Ukrainian state-owned postal company, Ukraine will continue to have low financial inclusion rates unless appropriate measures are taken.

The problem of population ageing is relevant not only for Ukraine but also for the CIS countries and "old" Europe. Therefore, there is a need to create preconditions for the gradual transition of this vulnerable group to the sphere of banking operations. Though the expansion of the network of branches of banks in regions 1 and 2 of the Clusters at first glance may seem economically impractical, given the scale of potential customers with small revenues in the form of pension benefits and financial assistance, in general, it will have a positive impact on building a stable base of demand and time deposits. Elderly people are not prone to impulsive actions, conducting risky banking operations. On the contrary, their psychological portrait can be described as well-balanced, conservative, with specific financial goals (financing current needs, helping relatives, postponing to a "rainy day"). Therefore, strategies for the development of branch networks should take into account the needs of the population least experienced in banking in order to both expand the customer base and build trust with consumers of their services.

The problems of financial inclusion have especially intensified in Ukraine under the conditions of martial law when after damage to the energy infrastructure in Ukraine there is a significant shortage of electricity. This led to the partial closure of bank branches or the limitation of their work during the hours of the absence of light. In this direction, it is necessary to intensify the work of banks to inform the population about the initiative of the National Bank of Ukraine - POWER BANKING. This is a unified network of Ukrainian bank branches that will work and provide the necessary services to customers even during a blackout [14]. It is also important to strengthen the level of financial inclusion in the de-occupied territories and territories of the Western region, where population migration and the number of internally displaced persons increased significantly in 2022. For such segments of the population, access to financial services, especially bank loans, is extremely important today. This primarily concerns access to such bank products as mortgage loans under the Affordable Mortgage Program at 3%, the "Affordable Loans 5-7-9%" Program and grants under the "eRobota" program.

The conducted research and the proposed algorithm of clustering of regions of Ukraine by the level of financial inclusion of the population in the market of bank loans can be used to assess the state of financial inclusion of any country. Besides, the results can be used to develop and implement methods of quality strategic management in order to gain a competitive advantage in the market of banking services. It also provides an opportunity for senior management and leadership of banks to ensure optimal pricing policy, proportionality between supply and demand for banking services and, thus, solve long-term and current problems of streamlining banking services for people in different regions and creating conditions for strengthening the competitiveness of domestic banks in the financial market.

The authors of the article plan to use a cluster approach in future assessing the level of financial inclusion in Ukraine, dividing its territories into de-occupied regions, regions close to hostilities (front-line regions), regions with the largest number of internally displaced persons, etc.

REFERENCES

1. Alliance for Financial Inclusion. (2023). URL: <https://www.afi-global.org/about/>.
2. Center for Financial Inclusion. (2023). URL: <https://www.centerforfinancialinclusion.org/>.
3. Frost, J., Gambacorta, L., & Hyun Song Shin. (2021). From Financial Innovation to Inclusion. *Finance & Development*. No. 58. Pp. 14-17. URL: <https://www.imf.org/external/pubs/ft/fandd/2021/03/pdf/fd0321.pdf>.
4. Gavurova, B., Soltes, M., & Kovac, V. (2017). Application of Cluster Analysis in Process of Competitiveness Modelling of Slovak Republic Regions. *Transformations in Business & Economics*. No. 16. Pp. 129-147. URL: <https://publons.com/p/18998091/>.
5. Grohmann, A., Klühsb, Th., & Menkhoff, L. (2018). Does financial literacy improve financial inclusion? Cross country evidence. *World Development*. No. 111. Pp. 84-96. <https://doi.org/10.1016/j.worlddev.2018.06.020>.
6. Gutiérrez-Romero, R., & Ahamed, M. (2021). COVID-19 response needs to broaden financial inclusion to curb the rise in poverty. *World Development*. No. 138. <https://doi.org/10.1016/j.worlddev.2020.105229>.
7. Klebanova, T., Hurianova, L., & Chagonets L. (2018). Business analytics of multidimensional processes: a textbook. Kharkiv: *KhNEU named after Kuznets*.
8. Lee, D., Chuen, K., & Deng, R. (2017). Handbook of Blockchain, Digital Finance, and Inclusion. Volume 1. London: *Academic Press*. <https://doi.org/10.1016/C2015-0-04334-9>.
9. Li Zongkeng, Li Zhuoran, Andrii Mykhailov, Wei Shi, Yang Zhuquan, & Xia Surong. (2021). Evaluation and Analysis of Socio-Economic Development Level and Management in Guangxi province of China. *Estudios de Economía Aplicada*. No. 39. <https://doi.org/10.25115/eea.v39i5.5089>.
10. Ministry of Economy of Ukraine (2022). The rate of GDP fall is slowing down. URL: <https://www.me.gov.ua/News/Detail?lang=uk-UA&id=cd57914a-80ec-4b75-a34b-787296908da7&title=V2022-RotsiTempiPadinniaVypSpovilniatsiaDo33>.
11. Naumenkova, S. (2015). Financial Inclusion: Economic Content and Approaches to Measurement. *Current economic issues*. No. 166. Pp. 363-371
12. Naumenkova, S., Mishchenko, S., & Dorofiev, D. (2019). Digital financial inclusion: evidence from Ukraine. *Investment Management and Financial Innovations*. No. 16. Pp. 194-205. [https://doi.org/10.21511/imfi.16\(3\).2019.18](https://doi.org/10.21511/imfi.16(3).2019.18).
13. Opmene, Ie. (2013). Use of Cluster Analysis in Exploring Economic Indicator Differences among Regions: The Case of Latvia. *Journal of Economics, Business and Management*. No. 1. Pp. 42-45. <https://doi.org/10.7763/JOEBM.2013.V1.10>.
14. POWER BANKING. (2023). URL: <https://power.bank.gov.ua/>.
15. Shkvarchuk, L., & Slaviuk, R. (2020). Household demand for financial services: a regional perspective. *Bulletin of the National University "Lviv Polytechnic", Problems of Economics and Management*. No. 2(4). Pp. 106-114. <https://doi.org/10.23939/semi2020.02.106>.
16. State Statistics Service of Ukraine. (2022). Demographic and Social Statistics, Population and Migration. URL: <http://www.ukrstat.gov.ua/>.
17. Sydorova, A., Burkina, N., & Furman, T. (2020). Comparative analysis of household expenditures in Poland and Ukraine. *Problems of Economics*. No. 2. Pp. 424-432. <https://doi.org/10.32983/2222-0712-2020-2-424-435>.
18. Angela Kuznyetsova, Iryna Boiarko, Myroslava Khutorna, and Yuliia Zhezherun. (2022). Development of financial inclusion from the standpoint of ensuring financial stability. *Public and Municipal Finance*, 11(1), 20-36. [https://doi.org/10.21511/pmf.11\(1\).2022.03](https://doi.org/10.21511/pmf.11(1).2022.03).
19. The Global Partnership for Financial Inclusion. (2021). G20 Riyadh Summit Leaders Declaration. URL: <https://www.gpfi.org/news/g20-leaders-highlight-during-riyadh-summit-importance-restoring-strong-and-inclusive-growth-amid>.
20. The Global Partnership for Financial Inclusion. (2023). URL: <https://www.gpfi.org/>.

21. The National Bank of Ukraine. (2019). Financial Inclusion Forum. Leaving No One Behind. URL: <https://finclusion.bank.gov.ua/>.
22. The National Bank of Ukraine. (2022). Financial sector statistics. URL: <https://bank.gov.ua/ua/statistic/sector-financial/data-sector-financial#2fs>.
23. The National Bank of Ukraine. (2022). The National Bank and IFC discussed cooperation in the areas of financial inclusion and fintech. URL: <https://bank.gov.ua/ua/news/all/natsionalniy-bank-ta-ifc-obgovorili-spivpratsyu-za-napryamkami-finansovoyi-inklyuziyi-ta-fintehu>.
24. The United Nations. (2023). 17 Goals to Transform Our World. URL: <https://www.un.org/sustainabledevelopment/>.
25. The World Bank. (2020). UFA2020 Overview: Universal Financial Access by 2020. URL: <https://www.worldbank.org/en/topic/financialinclusion/brief/achieving-universal-financial-access-by-2020>.
26. The World Bank. (2021). The Global Findex Database 2021. Financial Inclusion, Digital Payments, and Resilience in the Age of COVID-19. URL: <https://www.worldbank.org/en/publication/globalfindex/Report>.
27. Ukraine Recovery Conference. (2022). Ukraine Recovery Plan: Financial System Functioning, Reform and Development. URL: https://uploads-ssl.webflow.com/621f88db25fbf24758792dd8/62d815769a3638dd981cda61_Financial%20System%20Functioning%2C%20Reform%20and%20Development.pdf.
28. Zhyvko, Z., & Zachosova, N. (2019). Financial inclusion as an indicator of management of bank component of the state financial security. *Financial and credit activity: problems of theory and practice*. No. 28. Pp. 354-361. <https://doi.org/10.18371/fcaptp.v1i28.163929>.

Майорова Т., Тимошенко І., Урванцева С., Черняк Р., Луців П.

КЛАСТЕРНИЙ ПІДХІД В ОЦІНЦІ ДОВОЄННОГО РІВНЯ ФІНАНСОВОЇ ІНКЛЮЗІЇ НАСЕЛЕННЯ РЕГІОНІВ УКРАЇНИ НА РИНКУ БАНКІВСЬКИХ КРЕДИТІВ

Проблема фінансової інклюзії населення є актуальною в країнах, що розвиваються, у тому числі й в Україні. Аналіз стану фінансової інклюзії на регіональному рівні засвідчив низький рівень надання українцям фінансових послуг. Мета статті – оцінити рівень фінансової інклюзії домогосподарств регіонів України на ринку банківських кредитів у довоєнний період за допомогою інструментів кластерного аналізу та обґрунтувати можливість їх застосування для формування ефективної регіональної політики держави в контексті відновлення та розвитку постраждалих територій, зокрема з урахуванням забезпечення доступу населення до кредитних продуктів банків. Методологічним інструментом дослідження був кластерний аналіз. Із його допомогою розроблено алгоритм кластеризації регіонів України за рівнем фінансової інклюзії населення на ринку банківських кредитів з урахуванням таких показників, як: кількість банківських відділень, сума кредиту на одну особу, процентні ставки за кредитами фізичним особам у регіонах. У результаті кластерного аналізу сформовано чотири кластери регіонів України: із низьким, середнім, високим та розвиненим рівнями доступу домогосподарств до кредитних продуктів банків. Більшість українських регіонів (15) ще в довоєнний час було визначено як такі, що мають низький рівень фінансової інклюзії населення на ринку банківських кредитів. Це дозволило зробити висновок, що ці області потребують особливої уваги з боку центральної та місцевої влади, а також фінансових установ щодо покращення доступу населення до банківських послуг. Обґрунтовано необхідність посилення фінансової інклюзії населення в Україні під час воєнного стану та в повоєнний період з урахуванням потреб деокупованих та прифронтових територій, а також регіонів із великою кількістю внутрішньо переміщених осіб.

Ключові слова: фінансова інклюзія, фінанси домогосподарств, банківський кредит, фінансовий ринок, процентна ставка за банківським кредитом, кластерний аналіз, метод Варда, регіональна економіка

JEL Класифікація: G02, G21, G28, C38