

ANALYSIS OF THE DEMOGRAPHIC SITUATION AND DEMOGRAPHIC SAFETY OF THE RURAL POPULATION: A CASE STUDY OF UKRAINE

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Abstract

The main task of the research is to clarify the main trends of demographic processes in the rural areas of Ukraine and to formulate proposals for the development and improvement of the demographic policy of Ukraine in the future. In the process of preparing the article, we used abstract-logical, mathematical-statistical, visualization and econometric methods of scientific research. According to the results of the grouping of the regions of Ukraine by the level of demographic safety, we found that most regions of Ukraine form a group of so-called "demographic danger". And if in 2009 there was a third of the regions in this group, then in 2021, about 50% showed demographic problems related to rural population caused by the decline of the population, including also the rural one and migration process with reduce the labor potential of rural areas, etc. In the article we substantiated that Ukraine, as a future member of the European Union, should move to the priority goals of the common agricultural policy (CAP), which include improving the quality of life in rural areas, diversifying the rural economy, improving the state of the environment and rural areas, and increasing the level of competitiveness of the agricultural industry.

Key words: rural population, rural areas, demographic safety, demographic crisis, labor potential of rural areas, demographic policy

INTRODUCTION

The demographic crisis, the reduction in the birth rate, and the need to form an effective demographic policy are among the most urgent problems in the formation of approaches to regulating the demographic situation of the rural population of Ukraine. The development of crisis phenomena in the population, and the need to find new ways to alleviate the situation is an objective necessity to ensure the sustainable development of rural areas and ensure the efficiency of the agricultural sector, which needs an adequate level of labour resources. At the same time, one of the main problems of the demographic situation is the decline in the birth rate, but from the point of view of the demographic transition, it is a universal process characteristic of all developed countries. After all, in general, currently in the world, about a

third of all countries have a value of the total fertility rate, which is below the level of simple reproduction. A significant deterioration of the demographic situation in the rural areas of Ukraine is also caused by the actual Russian hostilities.

Therefore, the development of an effective demographic policy for the rural population of Ukraine is an extremely important task, which requires the study of the socio-economic reasons for the deterioration of the situation.

The study of the issues of forming an effective demographic policy for the population is not new for modern economic science, and currently, there is enough work on methods of regulating social and economic policy aimed at eliminating deformation in the demographic sphere of rural areas. In this aspect, it is especially worth highlighting the works of such researchers as I. Balaniuk [1], O. Binert [2], I. Britchenko [3-11], Y. Chaliuk [12],

M. Dziamulych [13-21], S. Koshova [23-24], T. Kravchenko [25], M. Mašľan [26], A. Popescu [27-38], T. Shmatkovska [40-42], R. Sodoma [43-48], O. Stashchuk [49-51], I. Tofan [54], I. Tsymbaliuk [55], I. Yakoviyuk [57], V. Yakubiv [58], O. Yatsukh [59], and many others. At the same time, the significant acceleration of negative processes taking place in the demographic sphere of the rural population of Ukraine requires a more thorough assessment of the situation in order to find ways to solve existing problems.

MATERIALS AND METHODS

Under the demographic policy of the rural population, we understand the system of parameters of natural and mechanical movement and structure of the population, which allows us to effectively respond to internal and external threats to ensure the sustainable development of society and the life of an individual.

A demographical policy will allow to establish objectives and corresponding measures to develop effective mechanisms for solving the demographic crisis both at the national level and in the rural areas.

$$P_e = \frac{P_a}{P_{90}} \times 100$$

where:

P_e – the population percentage at present in the population existing in the year 1990;

P_a – the number of the available population in the analyzed period (thousands of people);

P_{90} – the number of the total population in 1990, (thousands of people)

$$D_b = \frac{P_a}{P_w} \times 100$$

where:

D_b – the demographic burden of the disabled population on the able-bodied population (%);

P_a – the number of the population younger and older than the working age (persons);

P_{90} – the number of the population at the working age, (persons)

Table 1. Weighting coefficients for calculating the integral indicator of the demographic policy of the rural population

Name of the indicator, unit of measurement	The value of the weighting factor
The size of the existing population, percentages to the level of 1990	0.1265
Life expectancy at birth, years	0.1265
Infant mortality rate (children under one year of age died) per 1,000 live births	0.1431
Coefficient of natural growth, per 1,000 people of the existing population	0.1874
Share of the elderly population in the total population (as of the end of the reporting period), percentages (aging ratio)	0.1625
The demographic burden of the disabled population on the able-bodied population, the percent	0.1265
The total coefficient of migration growth, reduction (-) (per 10,000 people)	0.1274

Source: systematized based on [52].

RESULTS AND DISCUSSIONS

The main task of the research is to clarify the main trends of demographic processes in the rural areas of Ukraine and to formulate proposals for the development and improvement of the demographic policy of Ukraine in the future.

The demographic situation in rural areas is characterized by a number of degradation processes, including depopulation (primarily due to a decrease in the birth rate and an increase in mortality), internal and external migration of the economically active rural population, reduction of the average life expectancy, etc. In this regard, the number of rural residents in Ukraine decreases by 1.1% every year, which is on average equal to 340 villages or 2 administrative districts and causes the reduction of the rural settlement network [53]. In addition to the demographic situation, the trends of socio-economic processes in rural areas, as well as the agroecological condition of agricultural lands, are also negative.

The depopulation process changes the location of the population on the territory, and ethnic proportions, and affects the dynamics of the population structure by gender, which, in turn, affects the intensity of natural and

migration processes. The social consequences of depopulation are quite diverse, and some of them are also related to the aging of the population.

In view of this, structural changes in the management of rural areas are a particularly urgent task. We note that the reform process is caused primarily by the process of decentralization of power, which is designed

to increase the level of management powers of local self-government and, in particular, of rural territorial communities.

It is appropriate to note that since independence, Ukraine has observed a negative trend of deterioration of the demographic situation (Fig. 1) and a reduction in the number of rural settlements (Fig. 2).

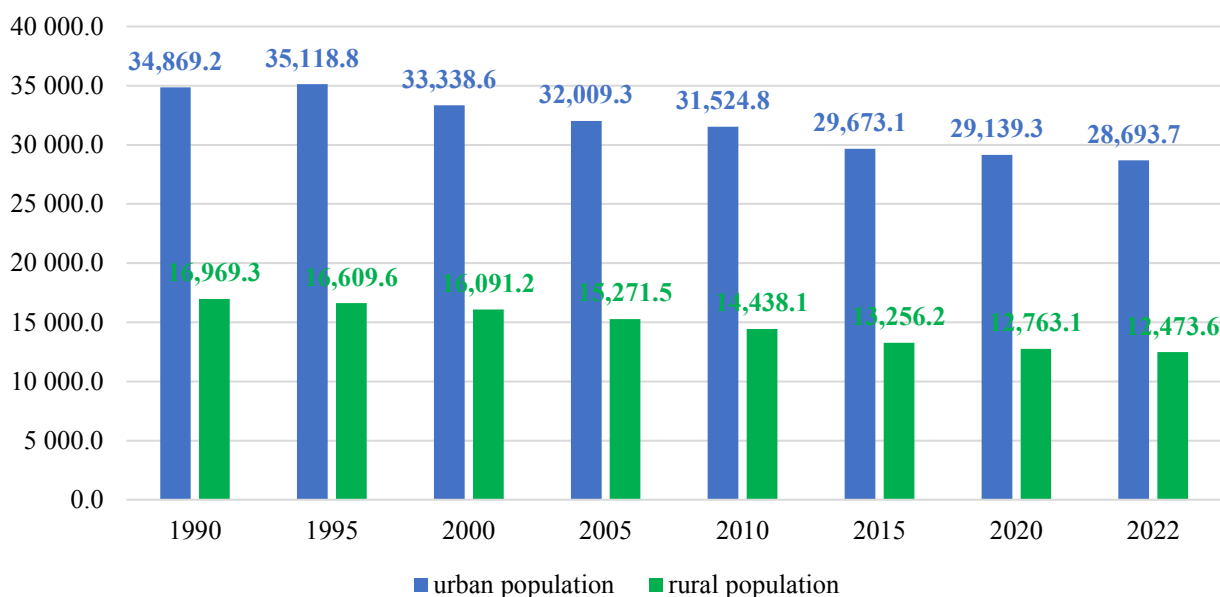


Fig. 1. Dynamics of the rural and urban population of Ukraine for 1990-2022, thousands of people.
 *Data for 2015-2022 are given without taking into account the territories occupied by Russia.
 Source: built based on [52].

According to the information of the State Statistics Committee of Ukraine, there is a decrease in the specific weight of both the urban and rural populations of Ukraine. Fig. 1 shows that both the urban and rural population has a tendency to decrease because compared to 1990, the number of rural residents has decreased significantly.

Regionally, the largest number of the rural population is registered in the western part of Ukraine, namely in the Vinnytsia, Zakarpattia, Ivano-Frankivsk, Rivne, Ternopil, and Chernivtsi regions, where compared to urban population, the rural population accounts for 50%, and lower shares are in the eastern parts of the country: Dnipropetrovsk, Donetsk, Luhansk, and Kharkiv regions with a share of the rural population of less than 20%.

It should be emphasized that there is an

uneven regional distribution of rural settlements in Ukraine, which may be due to geographical conditions, and therefore natural and climatic conditions, historical and cultural features, etc. (Fig. 2).

At the same time, the cause and effect of depopulation is the sex-age structure of the population, which exerted and continues to exert a decisive influence on the stability of the demographic system, because they (in particular, the ratio of men and women) are the main factors in the development of both the entire population and its regional components. For the rural population of Ukraine, «aging from below» is observed, which is caused by a gradual decrease in the number of children due to a decline in the birth rate.

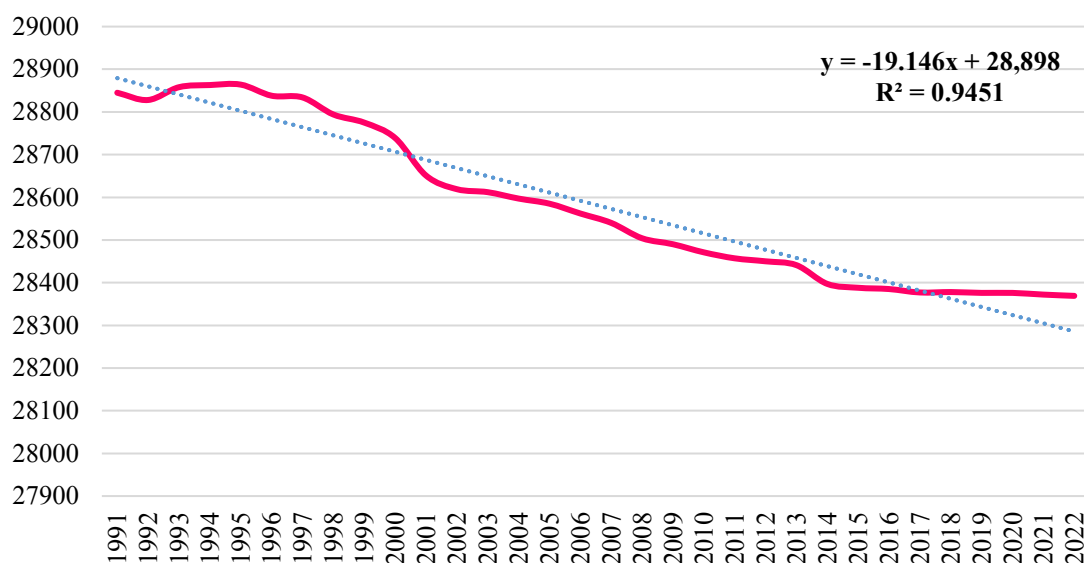


Fig. 2. Dynamics of the number of rural settlements in Ukraine by year
 Source: built based on [52].

There is a gradual transition from a «stationary» type of age structure to a «regressive» one. Another disappointing conclusion can be made by predicting a significant aging of the population when the large generation of 49-54-year-olds ages. It is expected as in the future, about 33% of the rural population in Ukraine to be older than 60, even though at the current level of mortality, the increase in the aging rate slows down.

According to the age scale proposed by the UN, a population in which the proportion of people aged 65 and over is more than 7% is considered «old». The population of Ukraine crossed this limit in 1970, and today the share of people over 65 in Ukraine is about 15.5%. The rate of aging of the rural population of Ukraine, that is, the specific weight of people aged 60 years and older in today's realities is 23%, while men have 17%, and women – have 28%, which is connected with the high mortality of men. At the same time, the threshold value for simple reproduction of the rural population of Ukraine is 12%, and for extended – 8%.

The problem of the qualitative and quantitative composition of the labour potential of rural areas remains unresolved. The gender imbalance in the structure of the population's economic activity in rural areas is obvious, as there is a tendency to decrease the specific weight of men and vice versa, to

increase the specific weight of women in the gender structure. Note that the researcher of problems of development of rural areas H. I. Sabluk [39] draws attention to such a problem as the role of a peasant woman, a working woman. As of January 1, 2022, the ratio of men and women living in rural areas of Ukraine was 47% and 53%, respectively. According to H. I. Sabluk, in each rural territorial community, it is expedient to create a so-called women's centre, where all socio-economic aspects of the life of a peasant woman as the guardian of a rural family would be concentrated.

By demographic policy, we understand the system of parameters of natural and mechanical movement and population structure, which allows us to effectively respond to internal and external threats to ensure the sustainable development of society and human life. In our opinion, based on open statistical data, it is appropriate to use the following indicators to determine the level of demographic policy of the rural population: total population growth, birth rate, mortality rate, natural increase rate, infant mortality rate, migration balance, demographic burden, general population aging rate.

The calculation of the indicator of demographic policy of the rural population of the regions of Ukraine was carried out by analogy with the integrated indicator of the

level of demographic security proposed by I. Hudzeliak and N. Verchyn [56]. As a result of the determination, the final indicator varies between 0 and 1.0. Note that the indicator of demographic policy makes it possible to analyze the current situation, identify prevailing trends, and conduct a retrospective analysis of the demographic indicators of the

region and to determine the possible state of the demographic situation in the future. To compare the regions of Ukraine by the level of territorial differentiation of the demographic situation of the rural population, a ranking method was chosen, where the indicator used is the indicator of demographic statement.

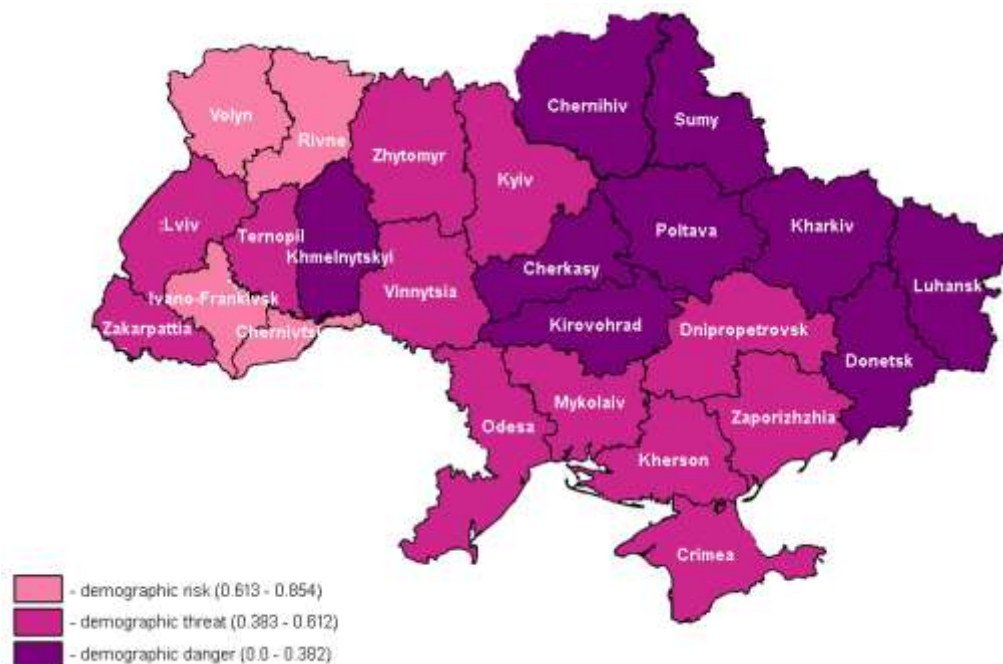


Fig. 3. Cartogram of the results of the grouping of the regions of Ukraine according to the level of demographic safety of the rural population in 2009
 Source: built based on [52].

Based on the results of the calculations, it was established that in 2009 (Fig. 3) according to the indicator of demographic safety of the rural population, Volyn, Rivne, Ivano-Frankivsk, and Chernivtsi regions belonged to the regions of demographic risk. The regions with a demographic threat included Zakarpattia, Lviv, Ternopil, Zhytomyr, Vinnytsia, Kyiv, Odesa, Mykolaiv, Kherson, Dnipropetrovsk, and Zaporizhzhia and Crimea regions.

Khmelnytskyi, Cherkasy, Kirovohrad, Chernihiv, Sumy, Poltava, Kharkiv, Luhansk, Donetsk regions were regions with a demographic danger.

In 2015 (Fig. 4), Volyn, Rivne, and Zakarpattia regions were among the demographic risk regions. Khmelnytskyi, Vinnytsia, Cherkasy, Kirovohrad, Chernivtsi, Sumy, Poltava, Dnipropetrovsk, Zaporizhzhia, Luhansk, and Donetsk regions

were among the regions with demographic danger.

In 2021 (Fig. 5), Volyn, Rivne, and Kyiv regions were among the demographic risk regions. Vinnytsia, Cherkasy, Kirovohrad, Kherson, Mykolaiv, Chernihiv, Sumy, Poltava, Kharkiv, Dnipropetrovsk, Zaporizhzhia, Luhansk, and Donetsk regions belonged to regions with demographic danger.

It was established that during the research period, Volyn and Rivne regions demonstrated the highest indicator of demographic safety of the rural population and belonged to the so-called «demographic risk» group. Zakarpattia, Ivano-Frankivsk, and Chernivtsi regions «dropped out» of this group, but in 2021, the Kyiv region entered it. Lviv, Ternopil, Zhytomyr, and Odesa regions, were constantly included in the so-called «demographic threat» group.



Fig. 4. Cartogram of the results of the grouping of the regions of Ukraine by the level of demographic safety in 2015

Source: built based on [52].



Fig. 5. Cartogram of the results of the grouping of the regions of Ukraine by the level of demographic safety in 2021

Source: built based on [52].

In 2015, the Kharkiv region was included in the same group. Most regions of Ukraine form a group of so-called «demographic danger». And if in 2009 there was a third of the regions in this group, then in 2021 – half of them, which indicates the aggravation of demographic problems regarding the rural population of Ukraine. We also note that in the context of European integration processes, the experience of solving current problems of the development of rural areas in

the European Union is important for Ukraine. Moreover, in the Association Agreement with the EU on issues of political association and economic integration, Chapter V «Economic and sectoral cooperation» stipulates that expanded cooperation in the field of agriculture and rural development is envisaged. As about 51% of the world's population lives in rural areas, which cover 75% of the total area, and on which is achieved 32% of the global GDP, the

problem of sustainable development of rural areas is relevant not only for Ukraine but also for other countries [22].

Thus, the relevance of the European integration processes in Ukraine necessitated the adaptation of the European practice of transition to the principles of sustainable development of rural areas. It is interesting that the European Statistical Committee classifies European countries according to the specific weight of the rural population into "urban (the specific weight of the rural population is less than 20%), transitional (the specific weight of the rural population ranges from 20 to 50%) and rural (the specific weight of the rural population is more than 50%)".

Table 2. Statistical characteristics of the distribution of the specific weight of the rural population of the countries of the European Union (by country) and Ukraine (by region)

Statistical parameters	The European Union by country	Ukraine by regions
Arithmetic mean	31	34
Standard deviation	18	17
Median	336	278
Coefficient of variation, %	30	30
Dispersion	58	49

Source: systematized based on [52].

In view of this, the necessary mathematical measurements were carried out and it was established that the main statistical parameters of the distribution of the specific weight of the rural population in the countries of the European Union in the cross-section of countries and Ukraine in the cross-section of regions are very similar, namely, the arithmetic means, standard deviation, median, coefficient of variation and dispersion (Table 2). To visualize the results of the study, a polygon of the statistical distribution of the specific weight of the rural population of the countries of the European Union and Ukraine was built (Fig. 6). Thus, it was established that in solving the issues of Ukraine's transition to the principles of sustainable development of rural areas, it is necessary to take into account the experience of the European Union, since the features of demographic processes have similar trends and patterns of development.

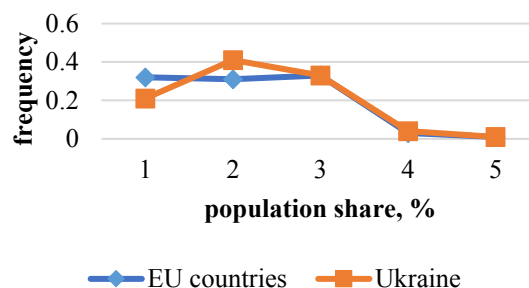


Fig. 6. Polygon of the statistical distribution of the share of the EU countries and Ukraine rural population
 Source: built based on [52].

That is why, the effective implementation of the rural development policy for optimizing both the development of the agricultural sector and of the rural areas, which are two interrelated and interdependent processes, we believe that it is important for Ukraine to adopt the experience and be guided by the main provisions of the common agricultural policy (CAP) of the European Union. For more than half a century, the main priorities of the SAP (prescribed in Article 39 of the Treaty of Rome) are primarily aimed at strengthening the position of the agricultural sector and the production of agricultural products thanks to rapid scientific and technical progress, as well as aimed at improving social welfare and the standard of living for those who work in the agricultural sector - primarily for the population of rural areas.

CONCLUSIONS

Based on the results of the research, it can be stated that the development of rural areas in Ukraine is characterized by a complex imbalance. The consequence of such a situation is the aggravation of the demographic crisis in connection with the constant decrease in the number of the population (including the rural population), migration processes, reduction of the labor potential of rural areas, etc.

Research by scientists confirms that in modern conditions it is impossible to fundamentally improve the age structure of the rural population by an increase in birth rates. Therefore, considerable attention must be paid to improving the quality of life of the

rural population, and its health, which can be reflected in the increase in life expectancy; creating opportunities for improving its quality, increasing the efficiency of using the labor potential of both the working population and the socio-cultural and labour potential of the rural population of older age groups.

In connection with the relevance of Ukraine's integration processes into the European Community, in our opinion, it is appropriate to borrow the experience of the European Union countries regarding issues of sustainable development of rural areas. We believe that Ukraine, as a future member of the European Union, should move to the priority goals of the common agricultural policy (CAP), which include improving the quality of life in rural areas, diversifying the rural economy, improving the state of the environment and rural areas, and increasing the level of competitiveness of the agricultural industry. In addition, it is advisable to direct state support and financial resources separately to the development of rural areas and rural production, which are interdependent and mutually determined processes, but not identical.

REFERENCES

- [1]Balaniuk, I., Kyrylenko, V., Chaliuk, Yu., Sheiko, Yu., Begun, S., Diachenko, S., 2021, Cluster analysis of socio-economic development of rural areas and peasant farms in the system of formation of rural territorial communities: a case study of Volyn region, Ukraine. *Scientific Papers Series "Management, Economic Engineering in Agriculture and Rural Development"*, Vol. 21(3): 177-188.
- [2]Binert, O., Sodoma, R., Sadovska, I., Begun, S., Shmatkovska, T., Balash, L., 2021, Mechanisms for improving economic relations in the milk subcomplex of the agricultural sector: a case study of Ukraine. *Scientific Papers Series "Management, Economic Engineering in Agriculture and Rural Development"*. Vol. 21(2): 101-110.
- [3]Britchenko, I., Bezpartochnyi, M., 2020, Optimization of commodity stocks the enterprise by means of HML-FMR clustering. *Financial and Credit Activity: Problems of Theory and Practice*. Vol. 3(34): 259-269.
- [4]Britchenko, I., Bohomolova, N., Pinchuk, S., Kravchenko, O., 2018, Assessment of the determinants of the financial security of railways in Ukraine. *Financial and credit activity: Problems of Theory and Practice*. Vol. 4(27): 270-281.
- [5]Britchenko, I., Cherniavska, T., 2017, Transport security as a factor of transport and communication system of Ukraine self-sustaining development. *Scientific Bulletin of Polissia*. Vol. 1(9): 16-24.
- [6]Britchenko, I., Drotárová, J., Antonov, M., Kholodna, J., Polonska, O., Popova, Y. 2022, Environmental and economic security in the conditions of digitalization of the Ukraine's economy. *AD ALTA: Journal of interdisciplinary research*. Vol. 12(2), Special Issue XXIX: 118-122.
- [7]Britchenko, I., Drotárová, J., Yudenko, O., Holovina, L., Shmatkovska, T., 2022, Factors and conditions of the environmental and economic security formation in Ukraine. *AD ALTA: Journal of interdisciplinary research*, Vol. 12(2), Special Issue XXIX: 108-112.
- [8]Britchenko, I., Hladchenko, S., Viktorova, L., Pronoza, I., Ulianova, K., 2022, Information as Element of Enforcing the States Information Security. *AD ALTA: Journal of Interdisciplinary Research*. Vol. 12(1), Special issue XXV: 110-114.
- [9]Britchenko, I., Kraus, N., Kraus, K., 2019, University innovative hubs as points of growth of industrial parks of Ukraine. *Financial and Credit Activity: Problems of Theory and Practice*. Vol. 4(31): 448-456.
- [10]Britchenko, I., Smerichevskiy, S., Kryvovyazyuk, I., 2018, Transformation of entrepreneurial leadership in the 21st century: prospects for the future. In *Advances in Social Science, Education and Humanities Research. Proceedings of the 2nd International Conference on Social, Economic and Academic Leadership (ICSEAL 2018)*. Vol. 217: 115-121.
- [11]Britchenko, I., Svydruk, I., Pidlypnyi, Y., Krupskiy, O. P., 2020, Lessons to Be Learned from Ukraine's Positioning in International Rankings: The Need for Institutional Support and Financial Support for Economic Creativity. *Management Issues*. Vol. 18(4): 90.
- [12]Chaliuk, Y., Dovhanyk, N., Kurbala, N., Komarova, K., Kovalchuk, N., 2021, The digital economy in a global environment. *AD ALTA: Journal of Interdisciplinary Research*. Vol. 11(1), Special issue XVII: 143-148.
- [13]Dziamulych, M., Hrytsenko, K., Krupka, I., Vyshyvana, B., Teslia, S., Tereshko, O., Fadyeyeva, I., 2022, Features of banks' liquidity management in the context of the introduction of the LCR ratio in Ukraine. *AD ALTA: Journal of interdisciplinary research*. Vol. 12(1). Special Issue XXVII: 148-152.
- [14]Dziamulych M., Krupka, I., Andruschak, Y., Petyk, M., Paslavaska, R., Grudzevych, Y., Martyniuk, R., 2022, Banking liquidity risk management in Ukraine based on the application of digital and information technologies. *AD ALTA: Journal of interdisciplinary research*, Vol. 12(2). Special Issue XXIX: 102-107.
- [15]Dziamulych, M., Krupka, I., Petyk, V., Zaplatynskiy, M., Korobchuk, T., Synenko, V., Avramchuk, L., 2023, Operational efficiency of Ukraine's banking system during the war. *AD ALTA: Journal of interdisciplinary research*, Vol. 13(1). Special Issue XXXII: 164-168.

- [16]Dziamulych, M., Kulinich, T., Shmatkovska, Y., Moskovchuk, A., Rogach, S., Prosovykh, O. Talakh, V., 2022, Forecasting of economic indicators of agricultural enterprises activity in the system of ensuring their management on the basis of sustainable development: a case study of Ukraine. *Scientific Papers Series "Management, Economic Engineering in Agriculture and Rural Development"*. Vol. 22(1): 207-216.
- [17]Dziamulych, M., Moskovchuk, A., Vavdiuk N., Kovalchuk N., Kulynych, M., Naumenko, N., 2021, Analysis and economic and mathematical modeling in the process of forecasting the financial capacity of milk processing enterprises of the agro-industrial sector: a case study of Volyn region, Ukraine. *Scientific Papers Series "Management, Economic Engineering in Agriculture and Rural Development"*. Vol. 21(1): 259-272.
- [18]Dziamulych, M., Myskovets, I., Zubko, A., Tereshchuk, O., Baidala, V., Voichuk, M., 2022, Formation of the natural resource economics in the system of environmental and economic security. *AD ALTA: Journal of interdisciplinary research*, Vol. 12(2). Special Issue XXX: 142-146.
- [19]Dziamulych, M., Petrukha, S., Yakubiv V., Zhuk, O., Maiboroda, O., Tesliuk, S., Kolosok, A. 2021, Analysis of the socio-demographic state of rural areas in the system of their sustainable development: a case study of Ukraine. *Scientific Papers Series "Management, Economic Engineering in Agriculture and Rural Development"*. Vol. 21(4): 223-234.
- [20]Dziamulych, M., Shmatkovska T., Petrukha, S., Zatsypina, N. Rogach, S., Petrukha, N., 2021, Rural agritourism in the system of rural development: a case study of Ukraine. *Scientific Papers Series "Management, Economic Engineering in Agriculture and Rural Development"*, Vol. 21(3): 333-343.
- [21]Dziamulych, M., Stashchuk, O., Korobchuk, T., Mostovenko, N., Martyniuk, R., Strelkova, I., Grebeniuk, N., 2021, Banking innovations and their influence on the formation of digital banking. *AD ALTA: Journal of Interdisciplinary Research*. Vol. 11(2), Special issue XXI: 108-112.
- [22]Khomiyuk, N., Bochko, O., Pavlikha, N., Demchuk, A., Stashchuk, O., Shmatkovska, T., Naumenko, N., 2020, Economic modeling of sustainable rural development under the conditions of decentralization: a case study of Ukraine. *Scientific Papers. Series "Management, Economic Engineering in Agriculture and Rural Development"*. Vol. 20(3): 317-332.
- [23]Koshova, S., Britchenko, I., Bezpartochnyi, M., 2022, Investment in the space industry: a comparative analysis of Ukraine and the EU. *Baltic Journal of Economic Studies*. Vol. 8(3): 2256-0742.
- [24]Koshova, S., Britchenko, I., Bezpartochnyi, M., 2022, The essence of financing the space in in the post-war period as an integral part of the country's reconstruction plan. *Financial and Credit Activity: Problems of Theory and Practice*. Vol. 4(45): 405-415.
- [25]Kravchenko, T., Borshch, H., Gotsuliak, V., Nahorni, V., Hanba, O., Husak, T. 2022, Social Responsibility of the Government in the Conditions of the Global Pandemic Crisis. *Postmodern Openings*. Vol. 13(1): 468-480.
- [26]Mašfan, M., Britchenko, I., 2023, Formation of an integrated system of state economic security. *AD ALTA: Journal of interdisciplinary research*, Vol. 13(1). Special Issue XXXII: 159-163.
- [27]Popescu A., 2013, Considerations on the Rural Population as a Resource of Labor Force in Romania. *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development*, Vol. 13(3): 229-236.
- [28]Popescu A., 2013, Considerations on the main features of the agricultural population in the European Union, *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development*, Vol. 13(4): 213-220.
- [29]Popescu A., 2015, Research on labour productivity in Romania's agriculture. *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development*, Vol. 15(2): 271-280.
- [30]Popescu, A., 2016, Research on the concentration of tourist arrivals in Romania. *Scientific Papers: Series Management, Economic Engineering in Agriculture and rural development*, Vol. 16(1): 425-429.
- [31]Popescu, A., 2016, Research on the dynamics and territorial dispersion of the occupied population in Romania's tourism in the period 2007-2015. *Scientific Papers: Series Management, Economic Engineering in Agriculture and rural development*, Vol. 16(4): 279-288.
- [32]Popescu A., 2016, The position of tourist and agrotourist guesthouses in Romania's accommodation structures. *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development*, Vol. 16(1): 417-424.
- [33]Popescu A., Condei R., 2015, Research on Romania's employment in agriculture and its position in the European Union, *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development*, Vol. 15(2): 281-289.
- [34]Popescu, A., Dinu T. A., Stoian, E., 2019, Changes, trends and relationships between average income and consumption expenditures per household in Romania in the period 2007-2017. *Scientific Papers: Series Management, Economic Engineering in Agriculture and rural development*, Vol. 19(2): 363-374.
- [35]Popescu, A., Dinu, T. A., Stoian, E., 2018, Demographic and economic changes characterizing the rural population in Romania. *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development*, Vol. 18(2): 333-346.
- [36]Popescu, A., Grigoras, M. A., 2011, Research concerning Rural versus Urban Population—Present and Prospect. *Scientific Papers: Series Management, Economic Engineering in Agriculture and rural development*, Vol. 11(2): 151-156.
- [37]Popescu, A., Matei, A., 2008, Researches concerning the feasibility of Production Integration Management in a family sericultural farm, *Bulletin USAMV Cluj-Napoca, Horticulture*, Vol.65 (2): 302-307.

- [38]Popescu, A., Matei, A., Sladescu, V., 2008, Research concerning production diversification and integration in order to increase productivity and competitiveness of family sericultural farms. *Scientific Papers Animal Science and Biotechnologies*, Vol. 41(1): 702-707.
- [39]Sabluk, G. I., 2015, Assessment of the state of the demographic situation in rural areas. *Economics of agriculture*. Vol. 3: 75-78.
- [40]Shmatkovska, T., Britchenko, I., Voitovych, I., Lošonczy, P., Lorvi, I., Kulyk, I., Begun, S., 2022, Features of banks' liquidity management in the context of the introduction of the LCR ratio in Ukraine. *AD ALTA: Journal of interdisciplinary research*, Vol. 12(1), Special Issue XXVII: 153-156.
- [41]Shmatkovska, T., Kulinich, T., Dziamulych, M., Rogach, S., Bilochenko, A., Serdiukova, O., 2022, Analysis of investment efficiency in the agricultural sector of Ukraine on the basis of sustainable development. *Scientific Papers Series "Management, Economic Engineering in Agriculture and Rural Development"*. Vol. 22(3): 649-657.
- [42]Shmatkovska, T., Volynets, L., Dielini, M., Magopets, O., Kopchykova, I., Kytaichuk, T., Popova, Yu., 2022, Strategic management of the enterprise using the system of strategic management accounting in conditions of sustainable development. *AD ALTA: Journal of interdisciplinary research*, Vol. 12(2), Special Issue XXIX: 123-128.
- [43]Sodoma, R., Brukh, O., Shmatkovska, T., Vavdiuk, N., Bilochenko, A., Kupyra, M., & Berezhnytska, G., 2021, Financing of the agro-industrial complex in the context of the implementation of international experience. *Financial and credit activity: problems of theory and practice*, 38(3): 341-350.
- [44]Sodoma, R., Cherevko, H., Krupiak, I., Andrusiak, H., Brodska, I., Shmatkovska, T., 2021, Regulation of the lending market and prospects of financial sector stabilization in Ukraine. *Financial and credit activity-problems of theory and practice*. Vol. 36(1): 4-13.
- [45]Sodoma, R., Lesyk L., Hryshchuk, A., Dubynetska, P., Shmatkovska, T., 2022, Innovative development of rural territories and agriculture in Ukraine. *Scientific Papers. Series "Management, Economic Engineering in Agriculture and rural development"*, Vol. 22(4): 685-696.
- [46]Sodoma, R., Shidnytska, G., Shvorak, A., Shmatkovska, T., Zurakovska, I., 2018, Regularities of agrarian receipts as a modern financial tool. *Economic annals-XXI*. Vol. 169(1-2): 46-49.
- [47]Sodoma R., Shmatkovska T., Dziamulych M., Vavdiuk, N., Kutsai, N., Polishchuk, V., 2021, Economic efficiency of the land resource management and agricultural land-use by agricultural producers. *Management Theory and Studies for Rural Business and Infrastructure Development*. Vol. 43(4): 524-535.
- [48]Sodoma R., Shmatkovska T., Dziamulych M., Vavdiuk, N., Kutsai, N., Polishchuk, V., 2021, Economic efficiency of the land resource management by agricultural producers in the system of their non-current assets analysis: a case study of the agricultural sector. *Scientific Papers Series "Management, Economic Engineering in Agriculture and Rural Development"*. Vol. 21(2): 577-588.
- [49]Stashchuk, O., Boiar, A., Shmatkovska, T., Dziamulych, M., Skoruk, O., Tesliuk, S., Zintso, Yu., 2021, Analysis of fiscal efficiency of taxation in the system of filling budget funds in Ukraine. *AD ALTA: Journal of interdisciplinary research*. Vol. 11(1) Special Issue XVII: 47-51.
- [50]Stashchuk, O., Shmatkovska, T., Dziamulych, M., Kovalska, L., Talakh, T., Havryliuk, O., 2021, Integrated assessment, analysis and management of financial security and stability of joint-stock companies operating in the agricultural sector: a case study of Ukraine. *Scientific Papers Series "Management, Economic Engineering in Agriculture and Rural Development"*. Vol. 21(2): 589-602.
- [51]Stashchuk, O., Shmatkovska, T., Dziamulych, M., Kupyra, M., Vahnovska, N., Kosynskyi, P., 2021, Model for efficiency evaluation of financial security management of joint stock companies operating in the agricultural sector: a case study of Ukraine. *Scientific Papers Series "Management, Economic Engineering in Agriculture and Rural Development"*. Vol. 21(1): 715-728.
- [52]State Statistics Service of Ukraine, <http://www.ukrstat.gov.ua>, Accessed on February 10, 2023.
- [53]Tiurina, A., Nahorni, V., Ruban, O., Tymoshenko, M., Vedenieiev, V., Terentieva, N., 2022, Problems and Prospects of Human Capital Development in Post-Industrial Society. *Postmodern Openings*. Vol. 13(3): 412-424.
- [54]Tofan, I. M., Ahres, O. H., Shmatkovska, T. O., 2017, Problems in administration of tax on real estate other than land in Ukraine. *Scientific bulletin of Polissia*. Vol. 2(3): 148-153.
- [55]Tymbaliuk, I. O., Shmatkovska, T. O., Shulyk, Y. V., 2017, Tax alternatives to implement the tax capacity of internet activity in Ukraine. *Financial and credit activity problems of theory and practice*. Vol. 1(22): 336-344.
- [56]Verchyn, N., Hudzeliak, I., 2015, Socio-geographic aspects of the integral assessment of demographic security of Ukraine and Lviv region. *Journal of social and economic geography*. Vol. 19: 84-88.
- [57]Yakoviyk, I., Chyzhov, D., Karpachova, N., Hlushchenko, S., Chaliuk, Yu., 2020, National security policy in Ukraine: a change in the system of power relations of the modern world. *Revista San Gregorio*. Vol. 42: 224-235.
- [58]Yakubiv, V., Sodoma, R., Hrytsyna, O., Pavlikha, N., Shmatkovska, T., Tymbaliuk, I., Marcus, O., Brodska, I., 2019, Development of electronic banking: a case study of Ukraine. *Entrepreneurship and Sustainability Issues*. Vol. 7(1): 219-232.
- [59]Yatsukh, O., Demchenko, I., Ilynytsky, D., Tsap, V., Shmatkovska, T., 2021, Management of banking innovations in the conditions of digitalization. *AD ALTA: Journal of Interdisciplinary Research*. Vol. 11(1), Special issue XVII: 123-127.