JEL: O15, Q00, R23

Ruslan Lupak[1], Bohdan Mizyuk[1], Volodymyr Zaychenko[2], Marta Kunytska-Iliash[3], Taras Vasyltsiv[4]

[1]Lviv University of Trade and Economics
[2]Central Ukrainian National Technical University
[3]Stepan Gzhytskyi National University of Veterinary Medicine and Biotechnologies Lviv
[4]State Institution "Dolishniy Institute of Regional Research of the National Academy of Sciences of Ukraine"
Ukraine

MIGRATION PROCESSES AND SOCIO-ECONOMIC DEVELOPMENT: INTERACTIONS AND REGULATORY POLICY

Purpose. *The purpose of the article is to test the developed methodical approach to analyzing the relationship and impact of the population migration and socio-economic development of the state, as well as to identify migration factors that affect key parameters of the national economy and vice versa – social and economic indicators that determine the intensity of migration, the substantiation of conclusions on this basis for the state policy of the regulation of migration processes for the preservation and development of the human resources of Ukraine.*

Methodology / approach. *The research methodology involves ten successive stages: (1) selection of indicators that characterize the socio-economic development of the state by 5 sub-indices: socio-demographic stability; social development; labor market and employment; quality of life of the population; sustainable economic development; (2) formation of a database under the values of indicators by the regions of Ukraine for the period 2010–2020; (3) division of indicators into stimulators and disincentives and their rationing; (4) formation of homogeneous time series; (5) determination of the dynamic weighing coefficients of indicators and their groups (sub-indices); (6) calculation of weighted coefficients of indicators; (7) construction of weighted coefficients of the sub-indices of socio-economic development; (8) calculation of the integral coefficient of the socio-economic development of Ukraine; (9) calculation of migration indicators (border crossing balance by Ukrainians and foreigners) of the population by regions and in Ukraine as a whole; (10) construction of time series of the integral indices of migration and socio-economic development by years and regions, assessment of the strength and direction of the relationships between migration indicators and the indicators of socio-economic development, as well as between the indicators of migration and arrival from other regions; from abroad (including per 10 thousand population), in urban settlements, in rural areas of Ukraine in 2010–2020.*

Results. *The development and testing of a methodical approach to assessing the impact of migration processes on the socio-economic development of Ukraine and its regions allowed identifying the strength of the relationships between migration, social, and economic indicators, the impact of these processes on the human resources in Ukraine. The greatest interdependence between the socio-economic environment and stationary emigration is found in terms of the disposable income of the population, average monthly nominal wages, the unemployment rate, average state social assistance, housing and crime rates. Concerning immigration, close relationships are found with the economic indicators of regional development, small business performance, the unemployment rate, average monthly nominal wages, informal employment, the volumes of budget funding for social protection goals, and the disposable income of the population.*

One of the dominant factors of immigration is education, which confirms the untapped potential of attracting foreigners for employment.

Originality / scientific novelty. *The novelty of the research results is in the development of methodical approaches to analyzing the interaction of migration and socio-economic processes with the formation of an algorithm of integral assessment by the components of socio-demographic stability, social development, employment, quality of life, sustainable economic development. The author's methodical approach to assessment is offered, which allows carrying out empirical modeling and the assessment of the impact of socio-economic development on the intensity of migration processes, substantiating priority areas of the state regulation of migration potential (including wages, personal and state security).*

Practical value / implications. *The practical significance of the research results is in the considerable improvement of the information and analytical basis for the formation of an effective state policy for the regulation of migration processes in Ukraine. Using migration, the bodies of the State Migration Service of Ukraine and the State Statistics Service of Ukraine can analyze the impact (including potential, forecast) of different types (external / internal, stationary / labor, urban / rural settlements, etc.) of migration on the social-economic development of the state and its territories, as well as model the direction and intensity of migration, its structure depending on changes in the values of certain parameters of the socio-economic development of the country and its regions.*

Key words: *human resources, population migration, socio-economic development, regions, rural and urban areas, regulatory policy.*

Introduction and review of literature. Population migration as a socio-economic phenomenon is determined by the environmental factors of the donor country and the recipient country of human resources. At the same time, the socio-economic environment of the donor country affects the intensity of external migration, while the state of the development of the national economy and social sphere of the recipient country determines the scale of immigration flows. These and other general migratory aspirations are analyzed in the studies of J. Carling (2019), J. Carling and K. Schewel (2018), H. de Haas (2021), D. Hughes et al. (2019) and others.

The polar values of individual socio-economic indicators between specific territories trigger the process of the accumulation of migration potential in the areas of weak socio-economic development. Such factors are studied in the publications of S. Milasi (2020), F. Castelli (2018), N. Laurentsyeva et al. (2017), A. Leerkes and M. Kox (2017), H. de Haas et al. (2016) and other researchers.

Socio-economic inequality, in the long run, leads to the institutionalization of migration processes and is reflected through the formation of a broad system of infrastructural support for migration, which simplifies its processes and implementation mechanisms, intensifies migration as a phenomenon, and leads to the growth of migration channels, within which there is a transfer of human resources to the places of more efficient use of human knowledge and skills. Such conclusions are substantiated in the studies of O. Mulska et al. (2020), M. Czaika (2015) and O. Turnbull (2016).

At the same time, the genesis of scientific thought has shown that one of the important factors of migration is security, which can be considered both from the

standpoint of military conflicts and political and religious persecution. A special place in the formation of interstate migration flows is also occupied by migration barriers, which regulate and limit the intensity of migration processes (work permits, visas, etc.). They check the intensity of unwanted migration flows and can thus weaken and distort the established relationships between socio-economic and migration processes. These aspects are revealed in the works of H. de Haas (2021), D. Massey (2019), K. Vinke et al. (2020).

Since migration processes are formed in the coordinates of maximizing personal socio-economic effects and minimizing probable risks, and the cause-effect relations between migration and socio-economic processes may change, undergo changes in conditions of systemic global transformations as shown in the publications of M. van Houte et al. (2021), K. Schewel (2020), V. Dankevych et al. (2020), M. Gerver (2018), A. Danzer and B. Dietz (2014).

The theoretical understanding of cause-effect relations suggests that in the context of the globalization of society and economy, migration should be regarded as both a factor and a consequence of trends in the socio-economic development of individual regions in particular and the national economy as a whole. However, the complexity and multifactorial nature of relationships and influences actualize the use of econometric tools while studying the strength and direction of relationships and interdependencies between indicators that characterize the state of the socio-economic development and intensity of migration and vice versa.

The purpose of the article is to test the author's methodical approach to analyzing the relationship and impact of the migration and socio-economic development of Ukraine, as well as to identify migration factors that affect key parameters of the national economy and vice versa – social and economic indicators that determine migration intensity.

Results and discussion. To assess the state of the socio-economic development of Ukraine as a whole and in the regional context for the period 2010–2020, an empirical aggregate indicator is calculated: the integral index of socio-economic development, which in dynamics allows tracing the average trends of its course.

In the course of the research, 35 indicators of socio-economic nature (12 disincentives, 23 stimulants) were selected, which were divided into 5 groups: socio-demographic stability; social development; labor market and employment, quality of life; sustainable economic development (Table 1).

For indicators that have a positive effect on the quality of socio-economic processes, rationing was carried out by formula (1), while for indicators-disincentives – by formula (2):

$$f_{ij}^{g} = \frac{x_{ij}}{xmax_i}, \quad (1)$$

$$f_{ij}^{n} = \frac{xmin_i}{x_{ij}}, \quad (2)$$

where f_{ij}^{g} is the normalized values of *i*-indicator *g*-stimulator in *j*-period;

f_{ij}^{n} is the normalized values of *i*-indicator *n*-disincentive in *j*-period;

x_{ij} is the absolute values of *i*-indicators in *j*-period;

x_{max_i} , x_{min_i} are the maximum and minimum values of *i*-indicator in the study period.

Table 1

Indicators for assessing the socio-economic development of the regions of Ukraine

Indicators	Quantitative expression of indicators	Impact nature
1. Socio-demographic stability		
1.1. Total fertility rate	per 10 thousand population	Positive
1.2. Overall mortality rate	per 10 thousand population	Negative
1.3. Average life expectancy	years	Positive
1.4. Level of marriage	per 10 thousand population	Positive
1.5. Demographic load factor	per 1 thousand population aged 15–64	Negative
1.6. Share of the urban population	% to the current population	Positive
2. Social development		
2.1. Average amount of state social assistance to low-income families	USD per family	Positive
2.2. Number of students of higher educational institutions	per 10 thousand population	Positive
2.3. Expenditures of local budgets to ensure the functioning of the health sector	USD per capita	Positive
2.4. Expenditures of local budgets on social protection and social security	USD per capita	Positive
2.5. Expenditures of local budgets on the functioning of educational institutions	USD per 1 person under the age of 27	Positive
2.6. Number of pensioners of all categories	% per 1 thousand population	Negative
3. Labor market and employment sector		
3.1. Unemployment rate	%	Negative
3.2. Level of employment	% to the average number of full-time employees	Positive
3.3. Load on vacant demand	persons	Negative
3.4. Average monthly nominal wage	USD on average per one full-time employee	Positive
3.5. Wage arrears	USD per employee	Negative
3.6. Level of economic activity of the population	%	Positive
3.7. Informal employment	% to the employed population	Negative
3.8. Average duration of job search by the unemployed	months	Negative
4. Quality of life of the population		
4.1. Disposable income of the population	USD per capita	Positive
4.2. Consumer price index	% to the previous year	Negative
4.3. Share of the population with per capita equivalent cash income per month below the subsistence income	%	Negative
4.4. Provision of the population with housing	m^2 of total area per capita	Positive

Continuation of Table 1

4.5. Coefficient of coverage of expenses by the income of the population	coefficient	Positive
4.6. Emissions of harmful substances	tons per 10 thousand population	Negative
4.7. Number of detected crimes per 10 thousand population	per 10 thousand population	Negative
5. Sustainable economic development		
5.1. Foreign direct investments	USD per capita	Positive
5.2. Capital investments	USD per capita	Positive
5.3. Gross regional product	USD per capita	Positive
5.4. Number of small enterprises	per 10 thousand population	Positive
5.5. Ratio of sales of small enterprises to the number of employees	USD	Positive
5.6. Intensity of tax revenues to local budgets from the employed population	USD per employee	Positive
5.7. Intensity of tax revenues to local budgets from business activity	USD per enterprise	Positive
5.8. Ratio of import coverage by export	coefficient	Positive

Source: own calculations.

The standardization of indicators by the criterion of impact on the state of socio-economic development allowed forming the standardized series of indicators (x_{ij}) for each of the five groups of indicators and became a basis for further econometric calculations.

In general, the integral index of socio-economic development is calculated by formula (3):

$$ISED_{I_j}^{r} = V_{sds} \times I_{sds_j}^{r} + V_{sd} \times I_{sd_j}^{r} + V_{dlm} \times I_{dlm_j}^{r} + V_{qlp} \times I_{qlp_j}^{r} + V_{ced} \times I_{ced_j}^{r}, \quad (3)$$

where $ISED_{I_j}^{r}$ is the integral index of the socio-economic development for *r*-region in *j*-period;

V_{sds}, V_{sd}, V_{dlm}, V_{qlr}, V_{ced} are the corresponding values of the weight of the groups of indicators (*sds* – socio-demographic stability, *sd* – social development, *dlm* – the labor market and employment sector, *qlp* – quality of life, *ced* – sustainable economic development);

$I_{sds_j}^{r}$ is the index of the socio-demographic stability of *r*-region in *j*-period;

$I_{sd_j}^{r}$ is the index of the social development of *r*-region in *j*-period;

$I_{dlm_j}^{r}$ is the index of the development of the labor market and the employment sector of *r*-region in *j*-period;

$I_{qlp_j}^{r}$ is the index of quality of life of the population of *r*-region in *j*-period;

$I_{ced_j}^{r}$ is the index of the sustainable economic development of *r*-region in *j*-period.

The values of the calculated indices can take values ranging from 0 to 1 (Fig. 1). As the values of the integral index increase, the intensity and quality of socio-economic processes improve, as the weight and importance of indicators that positively affect the state of socio-economic development increase steadily, and disincentives – decrease. In the case of a decrease in the values of the integral index,

the processes taking place within the study area signal the intensification of destructive processes that destabilize the socio-economic situation, increase systemic risks to the effective functioning of the socio-economic system.

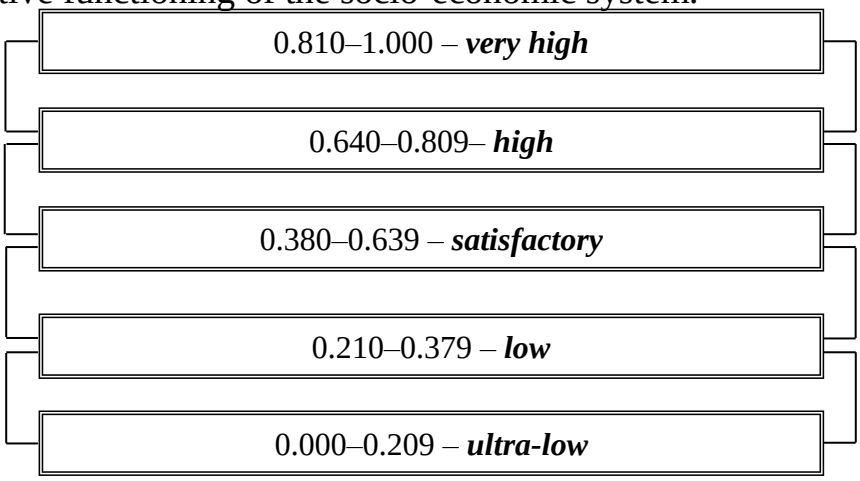

Fig. 1. Gradation of the values of the integral index of socio-economic development (based on E. Harrington (1965))

The results of calculations of the integral index of the socio-economic development of Ukraine for the period 2010–2020 (Fig. 2) show that the development of socio-economic processes in Ukraine took place on a sinusoidal principle.

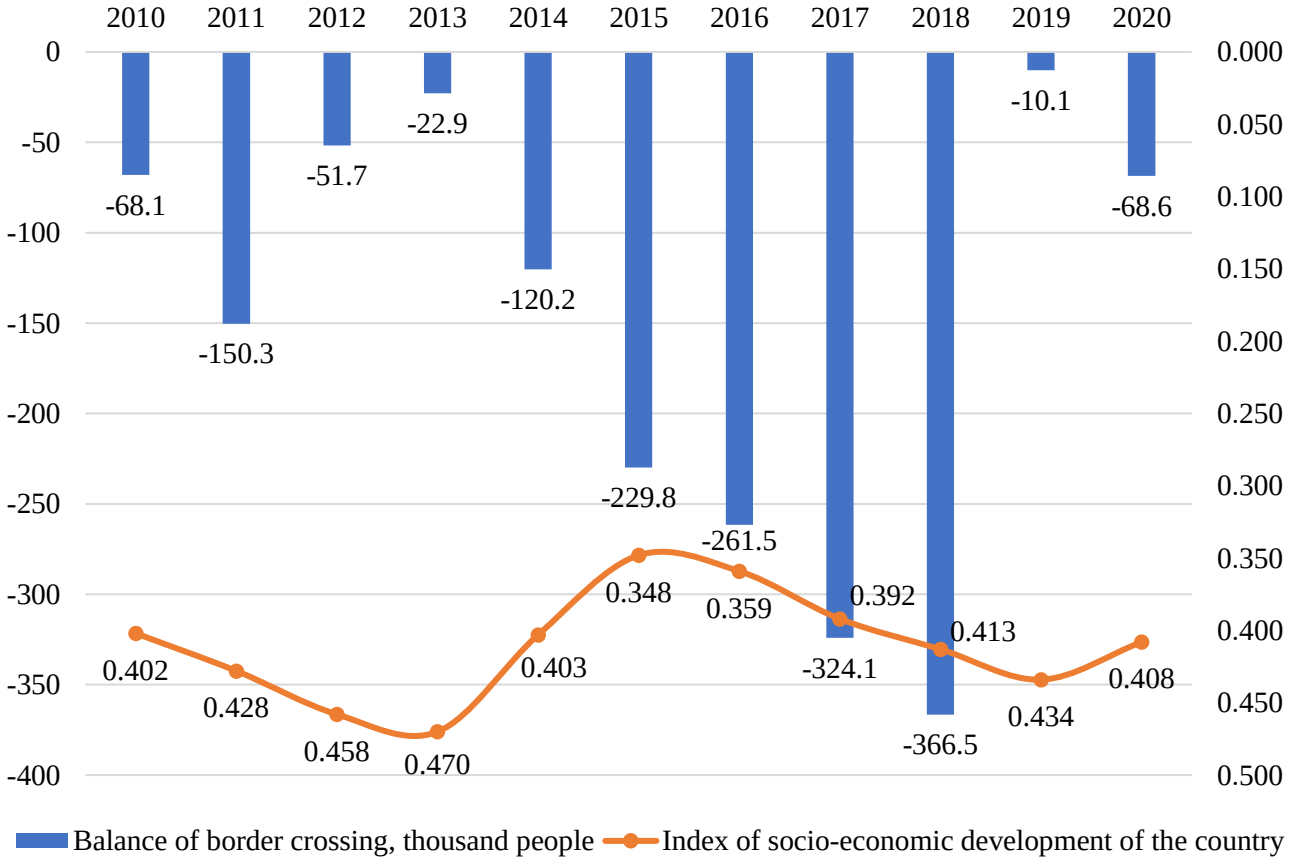

Fig. 2. Integral indices of the socio-economic development of Ukraine and the balance of border crossings for 2010–2020

Source: own calculations.

During 2010–2020, two periods of rapid recession (2014–2015 and 2020) and relatively smooth economic growth (2010–2013 and 2016–2019) could be distinguished. In general, the index of the socio-economic development of Ukraine ranged from 0.348 in 2015 to 0.470 in 2013, and as of 2020 was recorded at 0.408. Thus, the state of the socio-economic development of Ukraine according to Harrington criteria remains satisfactory, which indicates the inefficient use of the economic potential of the national economy and the availability of significant reserves to improve the values of indicators that determine the state of the socio-economic development of the country and its regions.

The instability of socio-economic development can be exacerbated or suppressed through the prism of the factor of migratory activity of the population. A mechanical washout of the population at an economically active age leads to gender and occupational disparities in regional labor markets, while, otherwise, it is a socio-demographic foundation for intensifying economic growth (Levytska et al., 2020). The density and direction of the relationships between these phenomena require economic and mathematical verification.

In general, for the period 2010–2020, according to the Border Guard Service of Ukraine due to migration, the number of citizens of Ukraine decreased on average by 152 thousand people per year, and the highest rates of depopulation occurred in the post-crisis 2016–2018 (261, 324, and 367 thousand people, respectively), which suggests the presence of relationships between migration and socio-economic development. Moreover, the intensity of emigration flows is more sensitive to trends in socio-economic processes, while the activation of immigration vectors occurs only in the case of stable positive socio-economic changes with a lag in 2–3 years.

If it is possible to assess the presence and strength of the relationship between the qualitative component of socio-economic processes and the intensity of external migration flows through the level of the socio-economic development of Ukraine as a whole, the generalization of trends on the values of indicators that determine the level of socio-economic growth in the regional context can allow assessing the presence and density of dependencies between the state of the development of individual territories and their internal and external migration growth. It is noteworthy that according to the official statistics, internal migration processes accounted for more than 90 % of relocations in 2010–2020 (State Statistics Service of Ukraine, 2021), which highlights the need to study the nature of internal migration flows at the level of external migration.

For this purpose, 23 integral indices of the socio-economic development of the regions of Ukraine were calculated. The steady trends of socio-economic growth in 2019–2020 are reflected in some decline in the results of migration activity (Fig. 3) and the growing role of immigration flows over emigration ones, according to the official statistics.

It is worth noting that the rapid spread of COVID-19 in 2020, together with the closure of borders, the introduction of national quarantine measures have limited the population's ability to move and distorted the relationships and dependencies between

migration and socio-economic development. The ability of the population to work, study, meet basic socio-economic needs remotely via the Internet has increased the intensity of globalization processes and has left its mark on the essential understanding of the philosophy of migration. Since in most cases employment or a change of the place of study, which is usually the main cause of migration processes, did not require the act of physical displacement, in 2020 the process of forming a new type of online migration started, which in the future will probably involve more participants.

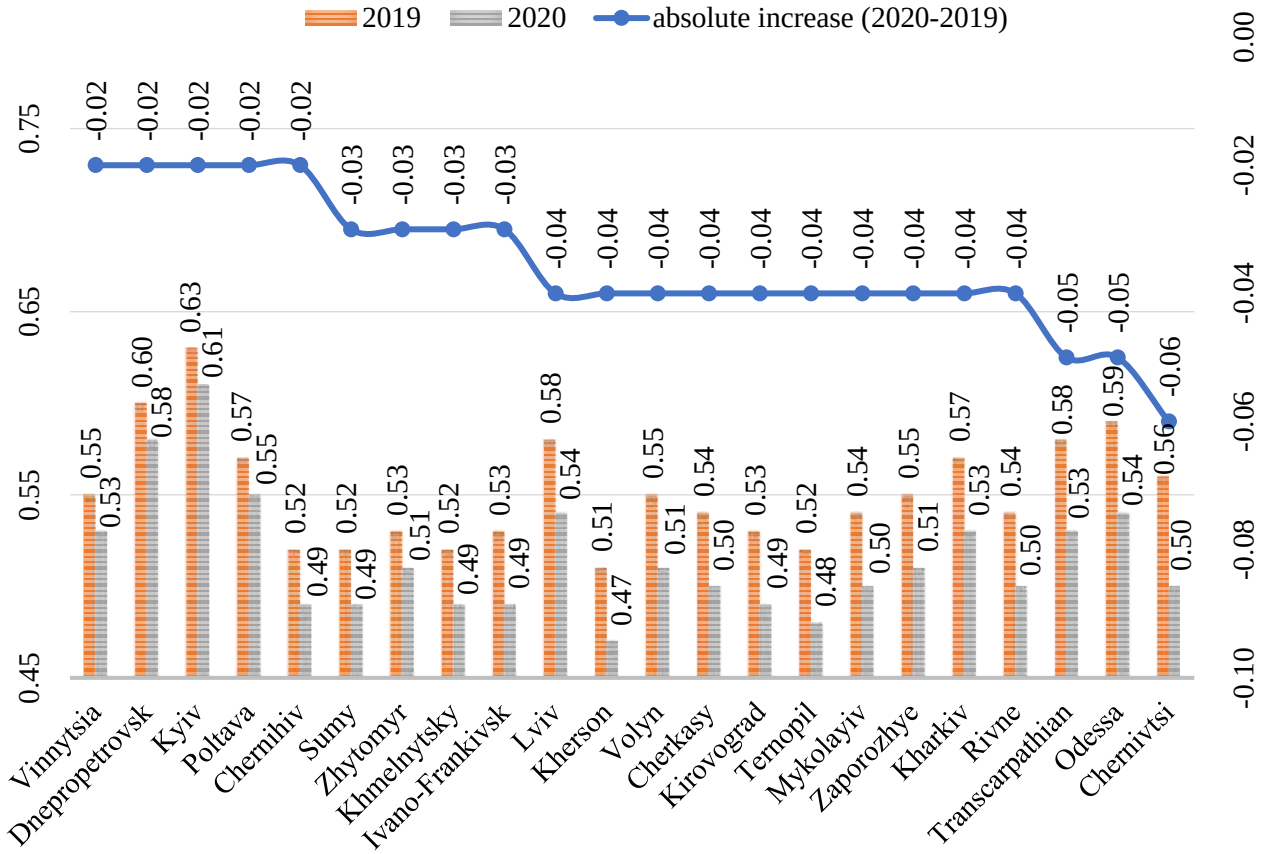

Fig. 3. Differentiation of the values of integral indices of the socio-economic development of Ukraine: a regional aspect for 2019–2020

Source: own calculations.

In 2020, together with a 25 % reduction in the intensity of migration processes compared to 2019, in all the regions of Ukraine without exception, the state of socio-economic development deteriorated. Moreover, the highest level of economic recession fell on Chernivtsi, Odesa, Transcarpathian, Rivne, and Kharkiv regions (State Statistics Service of Ukraine, 2021).

The calculated integral and weighted indices of the socio-economic development in Ukraine as a whole in 2010–2020 and in the regional context allowed assessing the presence, direction, and strength of relationships between the level of the socio-economic development of Ukraine and the quantitative results of migration processes by a national sign (Table 2).

Table 2

Strength of the relationships between migration indicators and indicators of the socio-economic development in Ukraine for 2010–2020: a matrix aspect

Indicators	Balance of border crossing by Ukrainians	Balance of border crossing by foreigners
Indices		
Integral index of socio-economic development	0.621	0.450
Index of socio-demographic stability	0.130	0.478
Social development index	0.422	0.579
Index of the development of labor market and employment sector	0.611	0.259
Index of quality of life of the population	0.632	0.279
Index of sustainable economic development	0.591	0.059
Individual indicators of socio-economic development		
Total fertility rate	0.271	0.590
Level of marriage	0.089	0.420
Average amount of state social assistance to low-income families, USD per family	0.662	0.479
Number of students of higher educational institutions, per 10 thousand population	0.230	0.669
Unemployment rate, %	-0.631	-0.622
Average monthly nominal salary (on average per full-time employee), USD	0.650	0.091
Informal employment, % of the employed population	-0.230	0.251
Average duration of job search by the unemployed	-0.489	0.188
Disposable income of the population (per capita), USD	0.770	0.379
Provision of the population with housing (m^2 of total area per capita)	0.589	0.182
Number of detected crimes per 10 thousand population	-0.561	0.329
Number of small enterprises per 10 thousand population	0.491	-0.081
Ratio of sales of small enterprises to the number of employees, USD	0.554	0.048

Note. -0.600≤*r*<-0.800; -0.400≤*r*<-0.601; -0.200≤*r*<-0.401; -0.201<*r*≤0.200; 0.201<*r*≤ 0.400; 0.401<*r*≤0.600; 0.601<*r*≤0.800 -0.801<*r*≤1.000 (our interpretation based on the calculated correlation coefficients).

Source: own calculations.

In general, the calculated correlation coefficients showed that in the national context the intensity and ratio of external emigration and immigration flows, which involve Ukrainian citizens, is formed in the socio-economic environment, while the migration of foreigners is determined mainly through the change in the values of indicators that reflect the social-demographic dimension of the state's development and to a lesser extent is explained by the action of economic factors.

Among the socio-economic indicators that are directly related to migration and probably stimulate the growth of arrivals of Ukrainian citizens from abroad over their departures outward the administrative borders of the country the following ones

should be noted: disposable income, the weighted index of quality of life of the population, average monthly wages, the average amount of state social assistance to low-income families, the integral index of socio-economic development, the index of the development of the labor market and employment sector. The correlation coefficients at more than 0.6, on the one hand, indicate a significant role of factors of socio-economic nature, but, on the other hand, suggest that the migration process is a multifaceted phenomenon, which also signals the civilizational development of society and its globalization.

Thus, it is considered expedient to differentiate the goal of external migration of Ukrainian citizens by a traditional economic criterion, which involves improving the material, the socio-economic situation of the participants of migration processes and the educational one, the essence of which is to acquire knowledge, skills, new experience, new worldviews on the philosophy of life and doing business (Shpak et al., 2017). Relatively close relationships between the results of migration of foreigners to Ukraine and the number of students in higher education institutions per 10,000 population (R = 0.669) indicate that one of the main goals of foreign citizens' moving to Ukraine is to obtain higher education. As the positive balance of external migration in 2010–2020 was formed with the countries that are mostly characterized by either weak economic development and demographic problems due to extremely high population density or difficult military-political situations and religious persecution (Morocco, India, Uzbekistan, Nigeria, Turkmenistan, Azerbaijan, Russian Federation, Belarus, Turkey), the relationship between the quantitative growth of foreigners' moving and the quality of life in Ukraine, the economic development of the national economy is not identified.

At the same time, social security aspects play an important role in deciding whether to enter Ukraine or leave, which are reflected through the formation of direct moderate relationships between the intensity of an increase in the immigration activity of citizens of other countries and growing values of the social development of Ukraine and the socio-demographic stability of Ukraine (Vasyltsiv et al., 2019). This suggests that if the trend of aging and quantitative decline in the number of indigenous residents of Ukraine remains, the likelihood of the emergence and intensification of so-called migration-replacement of the local population by newly arrived migrants from the third countries increases. Cultural, mental, and religious gaps between newly arrived migrants and the host society, on the one hand, increase the risk of exacerbating socio-political, cultural, and value problems, but on the other hand, are likely to improve demographic performance and become a prerequisite for sustainable economic development (Vasyltsiv et al., 2020). The above arguments prove that immigration flows of foreigners from less developed countries require constant and systematic monitoring and government regulation to minimize risks and maximize benefits for the socio-economic development of society and the economy.

The results of the research of the presence and strength of the relationships between indicators that quantitatively and structurally form regional immigration vectors and determine the level of socio-economic development have allowed

defining the relationship between the intensity of migrants' arrival depending on the place of their settlement in urban or rural areas and on the territory of their origin (within the country or from abroad) (Table 3).

Table 3

Strength of the relationships between the indicators of migrants' arrival and socio-economic development of the regions of Ukraine in 2020: a matrix approach

Indicators	Number of migrants arriving in the region				
	from the other regions	from abroad	from abroad per 10 thousand of the available population	in urban settlements	in the countryside
Indices					
Index of socio-demographic stability	0.252	0.408	0.339	0.355	-0.098
Social development index	0.503	0.752	0.683	0.684	0.132
Index of the development of labor market and employment sector	0.886	0.771	0.755	0.880	0.555
Index of quality of life of the population	0.369	0.415	0.438	0.382	0.288
Index of sustainable economic development	0.629	0.756	0.685	0.776	0.337
Integral index of socio-economic development	0.683	0.801	0.742	0.806	0.465
Individual indicators of socio-economic development					
Level of marriage	0.645	0.721	0.673	0.716	0.187
Share of urban population	0.601	0.697	0.611	0.755	0.047
Number of students of higher educational institutions, per 10 thousand population	0.507	0.859	0.789	0.741	-0.381
Expenditures of local budgets to ensure the functioning of the health sector per capita	0.631	0.731	0.670	0.755	0.405
Expenditures of local budgets on social protection and social security per capita	0.571	0.696	0.651	0.694	0.247
Unemployment rate	-0.762	-0.651	-0.637	-0.755	-0.228
Level of employment	0.575	0.383	0.377	0.523	0.504
Load on vacant demand	-0.507	-0.430	-0.423	-0.498	-0.150
Average monthly nominal wage	0.601	0.729	0.666	0.736	0.461
Wage arrears	0.354	0.380	0.406	0.401	0.198
Informal employment	-0.602	-0.420	-0.402	-0.568	-0.106
Average duration of job search by the unemployed	0.511	0.583	0.541	0.609	0.009
Disposable income of the population (per capita)	0.620	0.798	0.718	0.795	0.226
Share of the population with the average per capita equivalent cash income per month below the subsistence level	-0.507	-0.379	-0.347	-0.491	-0.250
Provision of the population with housing	0.095	-0.373	-0.309	0.167	0.481
Coefficient of coverage of expenses by the income of the population	-0.147	0.130	0.025	0.086	-0.458
Foreign direct investment (per capita)	0.537	0.760	0.688	0.719	0.202
Capital investment (per capita)	0.615	0.762	0.708	0.754	0.503

Continuation of Table 3

Average gross regional product (per capita)	0.638	0.796	0.737	0.783	0.435
Number of small enterprises (per 10 thousand population)	0.599	0.814	0.740	0.771	0.346
Ratio of sales of small enterprises to the number of employees	0.769	0.730	0.650	0.844	0.361
Intensity of tax revenues to local budgets from the employed population	0.718	0.641	0.587	0.771	0.410
Intensity of tax revenues to local budgets from business activity	0.547	0.610	0.546	0.679	0.164

Note. -0.600≤*r*<-0.800; -0.400≤*r*<-0.601; -0.200≤*r*<-0.401; -0.201<*r*≤0.200; 0.201<*r*≤ 0.400; 0.401<*r*≤0.600; 0.601<*r*≤0.800 -0.801<*r*≤1.000 (our interpretation based on the calculated correlation coefficients).

Source: own calculations.

The highest level of density of the relationship between the indicators of arrival and the index of socio-economic development of the regions is observed in the immigration vector "rural areas → urban settlements". The correlation coefficient at the level of 0.806 shows that the economic potential and opportunities for socio-economic development of urban systems are formed in the plane of their migratory appeal and ability to attract new human resources.

At the same time, only with the efficient use of available human resources, which in economic and statistical terms is measured through increasing indices of the development of the labor market and employment sector (R = 0.880), social development (R = 0.684), a reduction in the unemployment rate (R = -0.755), an increase in disposable income (R = 0.799) and average monthly wages (R = 0.736), the immigration channels of urbanization nature strengthen and grow.

Thus, the level of the arrival of the population to urban agglomerations should be considered as a systemic factor in the formation of socio-economic potential of the recipient territory, which in case of implementation contributes to the integral index of socio-economic development and stimulates the arrival of the population to urban centers. However, the intensity of migrants' arrival in rural settlements cannot be explained through the action of socio-economic indicators, as none of the calculated correlation coefficients exceeds 0.5. This indicates rather a weak relationship between the level of socio-economic development and the level of migration from urban settlements to rural areas. On the other hand, immigration processes in rural areas may be stochastic due to the lack of an effective system of the accounting and analysis of statistics both on migrants themselves and the results of socio-economic development.

The territorial origin of migrants plays an important role in examining the relationship between the level of socio-economic development and migration in the regional dimension, as migration from abroad and population movements within a country can be determined by different motives and factors. The results of the calculations partially confirmed the above regularities: migration from abroad is closely and directly related to the level of social infrastructure in the region, which is measured through the level of development of a higher education segment

(R = 0.859), local budget expenditures on ensuring the functioning of the health care sector (R = 0.731), social protection and social security (R = 0.691).

It is noteworthy that the intensity of the arrivals of migrants from abroad and their settlement in the regional dimension is further connected by close direct relationships with a change in the values of the index of socio-economic development (R = 0.801), income (R = 0.798). This suggests that territories with a higher level of economic development attract immigrants who have higher quality human capital and skills and can increase and improve the socio-economic characteristics of the recipient region under favorable circumstances. Thus, immigration from abroad to Ukraine is determined through the prism of social indicators, while in the regional dimension it is closely linked to the level of economic development and the situation in local labor markets.

The calculations to identify a relationship between the level of domestic immigration and the change in the values of the socio-economic development of the regions confirmed the fact that the intensification of immigration processes in the regional context occurs in places with higher levels of labor markets and employment (R = 0.886), including a lower unemployment rate (R = -0.762), higher levels of disposable income (R = 0.620) and average monthly wages (R = 0.601).

Similar calculations to assess the relationship between a change in the values of emigration of the population of Ukraine and socio-economic parameters in the regional context did not reveal close relationships. Migrant arrivals are always better registered than departures, as the fact of relocation is concealed and hidden whenever possible. On the other hand, such a paradoxical situation is due to the very low quality of migration statistics. An inefficient system of the registration of departures within the country and especially abroad has led to the distortion of statistical information, which disrupted and distorted logical interdependencies between socio-economic and emigration processes.

The calculations confirmed the hypothesis of the research on the existence of close relationships between migration activity of the population of Ukraine and indicators, which together form an idea of the state and trends of socio-economic processes in Ukraine and its regions.

Population migration in the context of the intensification of globalization processes and exacerbation of competition for human resources should be considered as a factor and consequence of the result of socio-economic development (Kuzmin et al., 2020). Thus, in the process of research, a system of regression equations was built and grouped according to the level of reliability, in which migration, on the one hand, is a foundation of socio-economic changes and, on the other, a result of socio-economic growth.

The econometric models that describe the impact of migration activity of Ukrainians and foreigners on the parameters of the socio-economic development of Ukraine allowed calculating coefficients of elasticity and selecting indicators that are most dependent and may change due to the impact of migration processes. As a result of calculations, it is established that an increase in the value of the migration balance

of Ukrainians per 10,000 population by 1 % under other constant conditions may lead to an increase in the value of the integral index of the socio-economic development of Ukraine by 0.09 % as well as improve the values of indices of the development of labor market and employment sector and quality of life by 0.06 % and 0.07 % respectively.

According to the results of the regression analysis, the more intensive growth of the volumes of Ukrainians' arrivals from abroad over their departures can improve the financial and economic situation of the population in terms of an increase in disposable income and average monthly wages by 0.24 % and 0.20 %, respectively if the value of the balance of border crossings by Ukrainians increased by 1 %. Along with an increase in income, the pressure on social protection should be expected to decrease, as the need to pay social assistance to low-income families will decrease by 0.24 %. On the other hand, with an increase in the values of the factor variable by 1 % due to the arrival of additional labor forces, the burden on regional labor markets may increase, which will be reflected in rising unemployment and informal employment by 0.07 % and 0.03 %.

In general, these regularities are quite justified. After all, the intensification of re-emigration processes due to the predominantly economic and labor nature of migration movements will lead to the transfer of financial and material resources obtained by migrants during their stay abroad to their places of residence. The psychological rejection of low income in Ukraine, which is many times lower compared to most recipient countries of labor migration from Ukraine, may provoke an increase in the role of shadow and informal employment. Thus, an increase in the balance of border crossings by Ukrainians, in general, has a more positive than negative impact on the parameters of socio-economic development (Ilyash, 2015). At the same time, leveling the possible above-mentioned risks of re-emigration processes requires state administrative influence and regulation through the development of effective re-emigration programs and psychological adaptation of Ukrainian migrants in the current social and socio-economic environment.

To systematically study the impact of migration on socio-economic development, regression models were additionally developed between the indicators of the socio-economic development of Ukraine and the balance of border crossings by foreigners (Table 4).

The results of econometric calculations clearly show that the level of impact of foreign migration on the overall development of socio-economic processes is relatively insignificant, as most regression models have a low level of reliability and a zero value of the coefficient of elasticity. On the one hand, this can be explained by the low presence of foreign migrants in the overall structure of migration processes. On the other hand, due to the weak socio-economic level of Ukraine's development, the migration of foreigners to Ukraine has a more socio-demographic and security-political nature than economic.

In general, with a quantitative increase in the value of the arrival of foreigners over their departure by 1 %, an increase in the integral index of socio-economic

development by only 0.02 %, the total birth rate – by 0.05 %, the level of marriage – by 0.03 %, and an increase in the cost of social assistance to low-income families by 0.02 % should be expected.

Table 4

Econometric models of the impact of migration activity of Ukrainians and foreigners on the parameters of the socio-economic development of Ukraine for 2010–2020

Balance of border crossing by Ukrainians per 10 thousand population		Balance of border crossing by foreigners per 10 thousand population	
Regression equations	Coefficients of elasticity, %	Regression equations	Coefficients of elasticity, %
Weighted and integral indices			
$ISED_I$=0.44+0.01SMU	0.09	$ISED_I$=0.40+0.02SMF	0.02
I_{SDS}=0.62+0,01SMU	0.02	I_{SDS}=0.61+0.01SMF	0.02
I_{SD}=0.48+0.01SMU	0.01	I_{SD}=0.42+0.04SMF	0.01
I_{DLM}=0.41+0.01SMU	0.07	I_{DLM}=0.39+0.01SMF	0.02
I_{QLP}=0.45+0.01SMU	0.08	I_{QLR}=0.44+0.01SMF	0.02
I_{CED}=0.31+0.01SMU	0.01	I_{CED}=0.28+0.02SMF	0.01
Individual indicators of socio-economic development			
DI=2936.61+160.30SMU	0.22	DI=2246.62+246.52SMF	0.06
IEM=22.62-0.21SMU	0.04	IEM=22.90+0.42SMF	0.02
GKB=103.61+1.73SMU	-0.05	GKB=92.10+10.94SMF	0.06
LUN=7.99-0.16SMU	0.08	LUN=8.82-0.48SMF	-0.04
NSE=81.23+0.81SMU	0.05	NSE=78.51-0.35SMF	0.01
HP=24.01+0.12SMU	-0.03	HP=23.51+0.12SMF	0.01
LM=62.42+0.33SMU	-0.03	LM=59.21+4.14SMF	0.04
NDC=100.92-3.20SMU	0.11	NDC=112.41-0.25SMF	0.01
SSA=161.41+8.90SMU	-0.25	SSA=120.52+19.16SMF	0.08
ATSJ=5.72-0.12SMU	0.08	ATSJ=6.21+0.05SMF	0.01
NSU=408.10+6.01SMU	-0.07	NSU=363.13+48.70SMF	0.03
RSPSEU=42.21+0.98SMU	-0.10	RSPSEU=36.61+0.24SMF	0.01
AS=383.51+17.70SMU	0.21	AS=316.91+7.11SMF	0.02

Note. ☐ – high level of model reliability (p>0.95); ▒ – average level of reliability (p>0.90); ■ – low level of reliability (p<0.90); SMU – balance of border crossing by Ukrainians; SMF – balance of border crossing by foreigners; $ISED_I$ – integral index of socio-economic development; I_{SDS} – index of socio-demographic stability; I_{SD} – social development index; I_{DLM} – index of the development labor market and employment sector; I_{QLP} – index of quality of life; I_{CED} – index of sustainable economic development; GKB – total fertility rate; LM – level of marriage; SSA – average amount of state social assistance to low-income families; NSU – number of students of higher educational institutions; LUN – unemployment rate; AS – average monthly nominal wage; IEM – informal employment; ATSJ – average duration of job search by the unemployed; DI – disposable income of the population; HP – provision of the population with housing; NDC – number of detected crimes; NSE – number of small enterprises; RSPSEU – ratio of the sales of small enterprises to the number of employees.

Source: own calculations.

Thus, with an increase in existing immigration channels from other countries, weak economic growth and moderate improvement in the state of demographic

reproduction should be expected. It is worth noting that the identified relationships are dynamic and may change while gaining socio-economic benefits and prestige on the world stage.

Conclusions. The dynamics and current intensity of migration flow with the participation of Ukrainian citizens are largely determined in the socio-economic environment, which in the case of positive changes acts as a factor in attracting potential migrants or, conversely, destabilization − contributes to the growth of emigration channels, which is confirmed by the links between the dynamics of the "balance of Ukraine" and the "integrated index of socio-economic development of the country".

The results of the analysis of the strength of the links between migration indicators and indicators of socio-economic development in the regions of Ukraine (for 2010–2020) allowed to identify in more detail the impact of migration. It was found that emigration processes have the greatest impact on socio-economic development (regression coefficient was 0.621), labor market development and employment (0.611) and quality of life (0.632). Directly in the structure of socio-economic development, the growth of emigration leads to an increase in disposable income (0.770) and average monthly nominal wages (0.650), improved housing (0.589), increased average state social assistance to low-income families (0.662), and also decrease unemployment rate (-0.631). The results of econometric calculations, in general, have confirmed the research hypothesis that population migration determines and transforms the potential of socio-economic development of donor territories of human resources.

Instead, the impact of immigration processes on socio-economic development (on the example of Ukraine) is much lower, which, however, is due to the small scale of migration to Ukraine, as well as the impact of other stronger factors on socio-economic dynamics in the country and its regions. The controversial nature of this conclusion highlights the application of the author's approach to conduct additional empirical assessments of the impact of immigration from Ukraine on the socio-economic development of the EU – the main donors of migration from Ukraine.

In the development of currently available research results, which also confirm the author's results and conclusions, econometric modeling of the strength of the links between indicators of migrant arrival and socio-economic development of Ukraine (for 2010–2020), but in the structure: external / internal migration; in rural / urban settlements and per 10 thousand of the existing population, which allowed to obtain new better results. In particular, internal migration most significantly contributes to the development of the labor market and employment (0.886), reduces unemployment and stabilizes the intra-regional labor market, while external – generally determines socio-economic growth in the region (0.801) and intensifies educational immigration (0.859); migration to rural areas has less impact, but contributes to the inflow of investment, infrastructure development and improvement of the social security system of rural residents, that is, it has a more socio-humanitarian character, while in urban settlements – economic, especially in terms of labor market development, unemployment and growth employment, weakening the

problems of social and labor relations. At the same time, internal migration activity in Ukraine is still urban with the dominance of the vector "rural – urban area", and in the regional dimension are more attractive regions with developed labor markets, high production and innovation potential, IT sector development. Thus, the obtained results allow us to talk about these and other factors as key in terms of improving public policy aimed at creating a favorable environment for living and development of the population, in particular on combating uncontrolled internal migration processes, which also weaken the demographic and social security of regions with negative consequences of rural depopulation and increasing the share of rural population of retirement age, regression of social and transport infrastructure, rising unemployment, increasing pressure on pensions and budgets.

The results of building econometric models of the impact of migration activity of Ukrainians and foreigners on the parameters of socio-economic development of Ukraine (2010–2020) allowed to assert the causal relationship of the impact of migration on reducing unemployment, increasing average monthly wages, stabilizing the price situation and household expenditures, as well as between migration and disposable income, migration transfers and aggregate food expenditures. The results also allow us to conclude that migration transfers affect the growth of capital investment, the number of small businesses and the intensification of innovation. Migration transfers contribute to the development of the capital market, increase the competitiveness of business and the economy of Ukraine in general.

Therefore, the task of the state is to create conditions for the effective use of the results of migration activity of the population of Ukraine to maximize the positive effects of socio-economic development and minimize the risks of destructive changes in society. Further research in this area is important to focus on a more detailed analysis of the structural characteristics of migration processes and their consequences in the system of social and economic security of Ukraine.

Acknowledgements. The research has been conducted within the framework of Applied Research "Migration Activity of the Population of the Carpathian Region" (State Institution "Dolishniy Institute of Regional Research of the National Academy of Sciences of Ukraine", Reg. No. 0119U002010).

References

1. Carling, J. (2019). Measuring migration aspirations and related concepts. MIGNEX Background Paper. Oslo, Peace Research Institute Oslo. Available at www.mignex.org/d023.

2. Carling, J., & Schewel, K. (2018). Revisiting aspiration and ability in international migration. *Journal of Ethnic and Migration Studies*, 44(6), 945–963. https://doi.org/10.1080/1369183X.2017.1384146.

3. Castelli, F. (2018). Drivers of migration: why do people move? *Journal of Travel Medicine*, 25(1), 1–7. https://doi.org/10.1093/jtm/tay040.

4. Czaika, M. (2015). Migration and economic prospects. *Journal of Ethnic and Migration Studies*, 41(1), 58–82. https://doi.org/10.1080/1369183X.2014.924848.

5. Dankevych, V. Y., Kamenchuk, T. O., Kononova, O. Y., Nadtochii, I. I., &

Ohor, H. M. (2020). Strategic planning for sustainable development of states: administration aspect. *International Journal of Management*, 11(4), 511–522. Available at: http://iaeme.com/Home/issue/IJM?Volume=11&Issue=4.

6. Danzer, A., & Dietz, B. (2014). Labour migration from eastern Europe and the EU's quest for talents. *Journal of Common Market Studies*, 52(2), 183–199. https://doi.org/10.1111/jcms.12087.

7. Gerver, M. (2018). Refugee repatriation and the problem of consent. *British Journal of Political Science*, 48(4), 855–875. https://doi.org/10.1017/S0007123416000193.

8. de Haas, H., Natter, K., & Vezzoli, S. (2016). Growing restrictiveness or changing selection? The nature and evolution of migration policies. *International Migration Review*, 52(2), 324–367. https://doi.org/10.1111/imre.12288.

9. de Haas, H. (2021). A theory of migration: the aspirations-capabilities framework. *Comparative Migration Studies*, 9, 8. https://doi.org/10.1186/s40878-020-00210-4.

10. Harrington, E. C. (1965). *The desirability function*. London, Industrial Quality Control.

11. Houte, van M., Leerkes, A., Slipper, A., & Breuls, L. (2021). Globalised citizenship and the perceived legitimacy of immigration control: narratives and acts of resistance in immigration detention. *Migration Studies*, 9(3), 1269–1291. https://doi.org/10.1093/migration/mnaa034.

12. Hughes, D., Akkök, F., Arulmani, G., & Zelloth, H. (2019). Migration: theory, research and practice in guidance and counselling. *British Journal of Guidance & Counselling*, 47(1), 1–5. https://doi.org/10.1080/03069885.2018.1564898.

13. Ilyash, O. (2015). Strategic priorities of Ukraine's social security concept development and implementation. *Economic Annals-XXI*, 7-8(1), 20–23.

14. Kuzmin, O., Bublyk, M., Shakhno, A., Korolenko, O., & Lashkun, H. (2020). Innovative development of human capital in the conditions of globalization. *E3S Web of Conferences*, 166, 13011. https://doi.org/10.1051/e3sconf/202016613011.

15. Laurentsyeva, N., & Venturini, A. (2017). The social integration of immigrants and the role of policy – a literature review. *Intereconomics*, 52(5), 285–292. https://doi.org/10.1007/s10272-017-0691-6.

16. Leerkes, A., & Kox, M. (2017). Pressured into a preference to leave? A study on the "specific" deterrent effects and perceived legitimacy of immigration detention. *Law & Society Review*, 51(4), 895–929. https://doi.org/10.1111/lasr.12297.

17. Levytska, O., Mulska, O., Ivaniuk, U., Kunytska-Iliash, M., Vasyltsiv, T., & Lupak, R. (2020). Modelling the conditions affecting population migration activity in the Eastern European region: the case of Ukraine. *TEM Journal*, 9(2), 507–514. https://doi.org/10.18421/TEM92-12.

18. Massey, D. S. (2019). The perils of seeing twenty-first century migration through a twentieth-century lens. *International Social Science Journal*, 68(70), 101–104. https://doi.org/10.1111/issj.12173.

19. Milasi, S. (2020). What drives youth's intention to migrate abroad?

Evidence from International Survey Data. *IZA Journal of Development and Migration*, 11(1). https://doi.org/10.2478/izajodm-2020-0012.

20. Mulska, O., Levytska, O., Panchenko, V., Kohut, M., & Vasyltsiv, T. (2020). Causality of external population migration intensity and regional socio-economic development of Ukraine. *Problems and Perspectives in Management*, 18(3), 426–437. https://doi.org/10.21511/ppm.18(3).2020.35.

21. Schewel, K. (2020). Understanding immobility: moving beyond the mobility bias in migration studies. *International Migration Review*, 54(2), 328–355. https://doi.org/10.1177/0197918319831952.

22. Shpak, N. O., Bublyk, M. I., & Rybytska, O. M. (2017). Social minima and their role in the formation of household welfare in Ukraine. *Scientific Bulletin of Polissia*, 1(9), 1, 63–71. https://doi.org/10.25140/2410-9576-2017-1-1(9)-63-71.

23. State Statistics Service of Ukraine (2021). Official web-site. Available at: http://www.ukrstat.gov.ua.

24. Turnbull, S. (2016). Stuck in the middle: waiting and uncertainty in immigration detention. *Time & Society*, 25(1), 61–79. https://doi.org/10.1177/0961463X15604518.

25. Vasyltsiv, T. G., Lupak, R. L., & Kunytska-Iliash, M. V. (2019). Social security of Ukraine and the EU: aspects of convergence and improvement of migration policy. *Baltic Journal of Economic Studies*, 5(4), 50–58. https://doi.org/10.30525/2256-0742/2019-5-4-50-58.

26. Vasyltsiv, T., Lupak, R., Kunytska-Iliash, M., Levytska, O., & Mulska, O. (2020). Instruments of regional policy for human resources conservation by means of regulation of external youth migration of rural territories of the Carpathian region. *Agricultural and Resource Economics*, 6(3), 149–170. https://doi.org/10.22004/ag.econ.305558.

27. Vinke, K., Bergmann, J., Blocher, J., Upadhyay, H., & Hoffmann, R. (2020). Migration as adaptation? *Migration Studies*, 8(4), 626–634. https://doi.org/10.1093/migration/mnaa029.

Citation:

Стиль – ДСТУ:

Lupak R., Mizyuk B., Zaychenko V., Kunytska-Iliash M., Vasyltsiv T. Migration processes and socio-economic development: interactions and regulatory policy. *Agricultural and Resource Economics*. 2022. Vol. 8. No. 1. Pp. 70–88. https://doi.org/10.51599/are.2022.08.01.04.

Style – APA:

Lupak, R., Mizyuk, B., Zaychenko, V., Kunytska-Iliash, M., & Vasyltsiv, T. (2022). Migration processes and socio-economic development: interactions and regulatory policy. *Agricultural and Resource Economics*, 8(1), 70–88. https://doi.org/10.51599/are.2022.08.01.04.