“Ukrainian students on the global map of academic migration”

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UKRAINIAN STUDENTS ON THE GLOBAL MAP OF ACADEMIC MIGRATION

Abstract

Considering the loss of talented youth in Ukraine caused by migration, there is a growing need to investigate how to attract and retain students. The study aims to identify the peculiarities of Ukrainian student migration against the background of global patterns of academic migration, focusing on factors of countries' attractiveness for the students. The typology of countries by the level of inbound and outbound academic migration is developed based on variation analysis. The correlation analysis is used to identify the factors that influence countries' attractiveness to students. The analysis of educational policies of the most attractive countries for Ukrainian students is fulfilled using the contextual analysis of legislative norms on academic mobility. In the global dimension, the variation of both inbound and outbound academic mobility is closely related to a country's economic level, measured by GNI per capita. However, the correlation analysis did not confirm the higher migration attractiveness of countries with a high level of economic development (correlation with GNI per capita is –0.147). The impact of employment and social and economic resilience of an economy was relatively significant, with the correlation coefficients of 0.426 and 0.371. The analysis of educational policies of host countries showed the active use of language integration tools, the combined use of financial mechanisms, and the involvement of universities in career development. Implementation of the best practices of educational management in Ukraine is critical for restoring demographic and intellectual capital.

Keywords academic mobility, migration, higher education, human capital, educational policies, educational management

JEL Classification F22, H52, J18, I28, O15

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INTRODUCTION

Student migration is one of the most discussed issues in research on intellectual migration. In particular, students belong to one of the four categories of intellectual migrants according to the OECD classification, together with startup founders, entrepreneurs, and highly skilled workers (OECD, 2023). The interest in this category of migrants is related to their potentially high impact on the economic development of host countries and significant long-term demographic changes. Therefore, integrating students in host countries is crucial for human resource management; and the development of educational policies aims to attract talented students.

Student mobility, while having a generally positive personal impact, carries significant risks for donor countries. In this context, researchers draw attention to the negative impact on the education system, the ability to maintain the existing scientific and pedagogical potential, and the danger of irreversible demographic losses (Mishchuk et al., 2019; Hrynkevych, 2017; Hrynkevych et al., 2022). This is in stark contrast to the new opportunities for the development of labor markets through intellectual migrants (Chugaievska & Wisła, 2023; Kersan-Škabić & Blažević Burić, 2022; Oliinyk et al., 2022).

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As one of the donor countries, Ukraine has been facing the problem of youth migration in favor of countries with higher economic and socio-cultural development for a long time. However, with the outbreak of the full-scale war, such trends have become threatening. The dilemma in overcoming this threat lies in the opposing humanitarian and economic goals. On the one hand, one notices personal benefits and human development through the 'window of opportunity' that has opened for Ukrainian refugees with the support of developed countries. On the other hand, there are macroeconomic interests of the state in the long term and the possibility of innovative development, one of the drivers of which is educated youth. Therefore, this problem cannot be solved easily; its solution requires understanding the processes and factors of student migration in the global dimension, and the specifics of Ukrainian student migration.

1. LITERATURE REVIEW

The migration of talent, which includes students according to the OECD classification of intellectual migrants (OECD, 2023; Mishchuk et al., 2024), is an area of research that is constantly growing in importance. This is due to the increasing dependence of the economy on knowledge and innovation, which requires the reproduction of high-quality human capital (Dańska-Borsiak, 2023). Student migration, like other types of migration, is often studied from the perspective of the push-pull theory of migration, which, since the publication of Lee's (1966) landmark work, has had many followers and critics but remains one of the most popular in the search for the causes of migration decisions. Such decisions are viewed from the perspective of the consequences for migrants themselves; in this regard, in different circumstances and for different migrant populations, the influence of personal environment, including parents, behavioral attitudes formed, and subjective perceptions of differences in the quality of life in the new and existing environment are studied (Hu, 2022; Jin et al., 2022). Such studies, focusing mainly on personal motivations and consequences, have a clear humanitarian orientation, which, at the same time, is insufficient to understand the larger patterns of migration activity and opportunities to respond to migration risks.

In the macroeconomic sense, an essential modern embodiment of the push-pull analysis of student migration is economic and non-economic factors characteristic of mass migration. Economic motives, such as choosing a country with a higher standard of living, are always relevant. In this direction, the links between migration and the economic development of countries, measured by GNI and related components of well-being, in particular, higher standards of living and high wages, have been confirmed (Aliyev et al., 2023; Benček & Schneiderheinze, 2024; Hrynkevych & Lutchyn, 2017; Kersan-Škabić & Blažević Burić, 2022; Khalid & Urbański, 2021). These links are mostly demonstrated when analyzing migration and labor market development. Many studies find evidence of higher migration attractiveness of countries with lower unemployment, including youth unemployment (Khalid & Urbański, 2021; Potuzakova & Bilkova, 2022). Factors specific to certain categories of migrants are more clearly identified. For example, for international students studying in Germany, the most crucial 'pull' factors are academic quality, career, and financial factors, whereas, for those who reside in the UK, the factor of social interaction is also included (Abbas et al., 2021). A successful career built on quality education can enhance the employability of migrants (Potuzakova & Bilkova, 2022; Radu et al., 2023). The same conclusions, but with a focus on students' attention to the possibility of employment after graduation, are made by Mozolová and Tupá (2024), Streimikis et al. (2024), Nayak (2023), and Tran et al. (2020).

Thus, studies on the migration attractiveness of countries for students are not limited to the influence of only one factor. While the focus is often on economic development and its associated consequences (developed labor market, more employment opportunities, decent wages), the pull factors may embrace other factors, including non-economic ones. Nevertheless, the economic ones have been proven in many countries and are the dominant focus of current migration research on youth.

Analyzing the reasons for students' migration, researchers frequently point to developed diaspora networks, family considerations, and other social environment components that facilitate integration into a new environment as part of non-economic stimuli for migration (Chugaievska & Wisła, 2023; Jin et al., 2022; Tavares, 2024). This aligns with the principles of migration network theory (Blumenstock et al., 2023; Giulietti et al., 2018; McKenzie & Rapoport, 2010; Munshi, 2020). Additionally, youth migration and the assessment of prospects include non-economic factors such as ease of learning a new language, the cultural environment (Bai & Wang, 2024), socio-economic and security issues (Vasyltsiv et al., 2024), spatial security, communication and relations (Mozolová & Tupá, 2024), as well as concerns related to inequality, social justice and the safeguarding of personal rights and freedoms (Mishchuk et al., 2018; Xie, 2023). The presence of well-known, prestigious universities, seen as signs of a high-quality academic environment and promising career prospects, also plays a crucial role (Abbas et al., 2021; Fakunle, 2021; Santos et al., 2020; Wojciechowski & Korjonen-Kuusipuro, 2023).

Thus, in conditions of relative security (before the full-scale invasion of russia), the migration of Ukrainian students should have been in line with global migration trends due to the influence of the same pull factors. However, the migration peculiarities of Ukrainian students also require considering the impact of migration networks, which, given the constant intensive migration activity of the Ukrainian population, were sufficiently formed before the war.

Since the beginning of 2022, part of the migration of young people has become forced. Ukrainian students have become a group of people exposed to one of the most pressing global risks of humanity: the risk of involuntary migration retains its position in the top 10 global risks of humanity in both the short (2 years) and long (10 years) term (WEF, 2024). Accordingly, the same factors that push refugees out of their countries of residence (including war) have also influenced students' motives.

In the face of such a large-scale risk, researchers emphasize the importance of supporting young people's education abroad as one of the critical humanitarian areas of national policies toward migrants (Al Gharaibeh et al., 2023; Fedorchuk et al., 2022; Herbst & Sitek, 2023; Omarova et al., 2024).

In the meantime, international student recruitment is becoming an important source of economic development for universities and has been considered one of the components of successful business models. They actively use marketing approaches, international student recruitment agents, and other operation-related factors within university management (James, 2023; Marom, 2023; Pham et al., 2024). The university's efforts are accompanied by the creation of comfortable living and study conditions. At the same time, the national efforts to attract international students are more important to analyze, as the rapid loss of talented Ukrainian youth may reflect not only personal negative expectations about the duration of the war but also the associated dangers. Such dangers are mitigated by internal displacement and the usage of distance learning wherever possible. In the meantime, the growing opportunities for academic migration with the outbreak of the full-scale war may reflect the national interest in rebalancing their human capital in the long term through well-designed education policies. Education policies typically involve the usage of fairly typical instruments to attract and retain foreigners. They are built around factors that help reduce discomfort and quickly adapt to new conditions: assistance with accommodation, accessibility of services and urban amenities (e.g., public transport or healthcare), and participation in covering costs, especially tuition fees (Herbst & Sitek, 2023). As for tuition fees, the "welfare state" pays special attention to this instrument of student engagement – e.g., in Sweden, they emphasize the importance of public funding of higher education, which allows for lower tuition fees for international students (Lundin & Geschwind, 2023). Hong et al. (2023) explicitly emphasize the importance of protecting international students' rights as consumers and potential future citizens. Such findings confirm the intention of host countries not only to balance their educational systems in the short term but also to create conditions for irreversible migration.

In the academic literature, governmental and educational policies on international students are not a common area of study, possibly due to signifi-

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cant differences in national migration regulation systems. For example, the analysis of 20 years of regulations in the Nordic countries has confirmed the increasingly different way international student mobility is framed. The only common feature for all countries is the predominance of educational instruments related to the quality of education and the development of international programs (Elken et al., 2023).

The large differences in the design of national policies on educational migrants do not allow one to assume that all these practices are used to attract and support Ukrainian students to the same extent in different host countries. At the same time, generalizing the instruments that attract Ukrainian students is vital for developing their educational policies.

This problem requires assessing both general approaches to attracting international students and studying best practices in countries with the most prominent inbound flows of Ukrainian migrants. Typical tools for attracting migrants, as a rule, include adaptation tools, including language and financial support, and ensuring access to services important for living in a new country (Elken et al., 2023; Herbst & Sitek, 2023; Lundin & Geschwind, 2023). Specific practices focused on the capabilities and interests of a particular host country can be summarized from the materials of educational agencies and information portals that provide information and organizational support to potential students (VisitUkraine, 2024; Osvita, n.d.; Global Study, n.d.; Edusteps, n.d.; Zsigmond et al., 2024).

Based on the existing theoretical justifications and practical experience of recruiting organizations, it is not the instruments used by individual universities for their marketing and economic purposes that are vital but rather active national educational policies. State instruments to support migrants have a greater informational impact and can reach a larger target group through financial support. University practices can be an additional, but not the central instrument of influence.

Considering the theoretical background developed in the field of student youth migration, the estimation of the current peculiarities and trends typical for migration from Ukraine should be focused on links with economic well-being, social environment, and education policy in Ukraine.

Given this, this study aims to identify the peculiarities of Ukrainian student migration before and after the outbreak of the full-scale war, considering global patterns of academic migration. To achieve the aim, the following hypotheses are tested:

H1: The most attractive countries for migration are those with high economic welfare indicators.

H2: Before the outbreak of the full-scale war, migration flows of Ukrainian students coincided with the general migration trends of Ukrainians.

H3: The factors that attracted Ukrainian students until 2022 were similar to those typically driving student migration (economic development of the destination country, employment opportunities, and social justice (including respect for human rights and socio-economic resilience in the host country)).

H4: With the outbreak of the full-scale war, the instruments of governmental educational policies to implement an active immigration educational policy significantly affected the choice of countries by Ukrainian students.

2. METHODS

The distribution of countries by the level of academic mobility is assessed using statistical indicators offered by the UNESCO Institute for Statistics. For this purpose, three basic absolute indicators are used: 1) inbound internationally mobile students by country of origin, 2) outbound internationally mobile students, and 3) net flow of internationally mobile students. Similar relative indicators (inbound mobility rate, IMR, %; outbound mobility rate, OMR, %) are calculated as the share of the relevant group of mobile students to their total number in the particular country or region.

The advantage of the UNESCO database is the availability of statistics for more than 150 coun-

tries, including Ukraine. The disadvantage is that the relevance of the data is usually two years behind the current year of analysis. Thus, this study targets data only up to and including 2021, as the only data currently available (UNESCO, n.d.a).

For *H1*, the study needs to typify countries by IMR and OMR. To build it, the principle of comparison with threshold values is used:

- IMR/OMR is close to 1.0 with a deviation of no more than 100% for countries with balanced student migration flows;
- IMR/OMR and OMR/IMR are greater than 2.0, reflecting the dominance of one of the migration processes.

A generalized indicator of economic development is GNI per capita. GNI data were selected to assess the links with migration (Metreau et al., 2024).

Countries were grouped using the coefficient method according to the logic of IMR and OMR ratios described above. The links with GNI per capita were estimated using the analysis of variance (ANOVA) method through MS Excel software.

H2 was tested using data on the migration of Ukrainian students (UNESCO, n.d.a) and the migration of the entire Ukrainian population. Official statistical resources had not published the total migration figures in absolute terms for 2021, so the data for 2020 were used (MPI, 2020). Data processing methods are graphical as well as structural and dynamic analysis.

H3 was tested using correlation analysis. The dependent variable (Y) is the number of Ukrainian students in the main destination countries – selected countries with at least 500 Ukrainian students (UNESCO, n.d.a). The independent variables, based on the literature review on the most important factors of attraction for students, are:

1) to assess the impact of economic development and the overall level of well-being in the country GNI per capita (X_1);
2) to assess labor market prospects:
   - Unemployment rate (X_2);
   - Average annual wages(X_3);
3) to assess social justice and human rights:
   - Personal freedom (X4);
   - Economic freedom (X5);
   - Human freedom (X6);
4) to assess the security environment and non-economic components of comfort:
   - Safety and Security (X7);
   - Socio-economic Resilience and Conditions (X8);
   - Non-Leisure Resources (X9) – the indicator was chosen based on the fact that it reflects the presence of major corporations and leading universities in the country, and therefore allows assessing the impact of the prestige of education and its links to employment opportunities in well-known companies.

The data sources for the independent variables were: X_1 (UNESCO, n.d.b), X_2 (ILOSTAT, n.d.), X_3 (OECD, 2021), X_4-X_6 (Vásquez et al., 2023), and X_7-X_9 (WEF, 2021).

The relationships between the factors were assessed using the values of Pearson's correlation coefficient using MS Excel software. The interpretation of the correlation coefficients is based on the Cheddock scale criteria. According to this approach, depending on the values of the correlation coefficient, the relationship of factors is interpreted as follows: 0-0.1 – none; 0.1-0.3 – weak; 0.3-0.5 – moderate; 0.5-0.7 – noticeable; 0.7-0.9 – close; 0.9-0.99 – strong; 0.99-1 – functional (Turan, 2020).

H4 was tested by qualitative analysis, namely by studying analytical reports and information materials that describe the components of educational policies used to attract Ukrainian students (DAAD, 2022, 2024; Khomenko, 2023; VisitUkraine, 2024; Osvita, n.d.; Global Study, n.d.; Edusteps, n.d.).

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3. RESULTS AND DISCUSSION

Having analyzed the data of the world countries by the levels of inbound and outbound student mobility, three groups of countries are distinguished.

The first group includes countries with balanced indicators of international academic mobility. The ratio of the levels of inbound and outbound academic mobility is close to 100%, the deviation does not exceed 100% (coefficient from 0.5 to 2). These countries are characterized by regulated risks of losing human and intellectual capital. Examples of such countries in 2021 were Spain, South Korea, Italy, Ukraine, Norway, Saudi Arabia, and Israel (Table 1).

The second group comprises countries with a dominant level of outward academic mobility. The ratio of outward and inward academic mobility exceeds 2 or 200%. These countries are characterized by high and ultra-high risks of losing human capital without social, economic, and other conditions for students to return. Examples of such countries in 2021 were Albania, India, Vietnam, and Uzbekistan (Table 1).

Finally, there are countries with a dominant level of inbound academic mobility. The ratio of inbound to outbound academic mobility exceeds 2 (or 200%). High benefits are associated with the growth of the economic potential of universities, improving the quality of the labor force in the labor market through competition. Risks are associated with the possibility of intercultural and social conflicts, and increased unemployment among young people and other categories of the population. Examples of such countries in 2021 were the United Kingdom, Australia, Canada, the Netherlands, Belgium, Germany, and France (Appendix A).

To analyze the links between international academic mobility and economic development in the global dimension, the analysis of variance based on UNESCO (n.d.a) and the grouping of countries by GNI per capita used by Metreau et al. (2024) were used.

The UNESCO Institute for Statistics' database on academic mobility makes it possible to analyze the relationship between indicators of a country's economic development and international academic mobility. For this purpose, UNESCO offers indicators of academic mobility defined for groups of countries by the level of gross national income per capita. Based on the World Bank's classification, five groups of countries have been identified: 1) low-income countries, 2) lower-middle-income countries, 3) middle-income countries, 4) upper middle-income countries 5) high-income countries.

In 2024, the World Bank placed Ukraine in the group of countries with above-average GNI per capita. Ukraine, with a GNI of USD 5,181 thousand in 2023, was included in the group of countries with upper-middle-income economies with a GNI per capita between $4,516 and $14,005 (Metreau et al., 2024).

Using a one-factor analysis of variance, a close and non-random relationship between the indicators of international academic mobility and the country's economic development level is revealed. For the statistical analysis, the dynamic series of indicators of the level of inbound and outbound academic mobility for 2012–2021 was used. The results are presented in Table 1.

The average level of inward academic mobility for countries with a high GNI per capita (7.055) is 13 times higher than the corresponding figure for countries with a below-average GNI (0.545). The group of low-income countries was not considered, as the time series data for inbound mobility in this group is incomplete.

The variation in inbound academic mobility is 97% correlated with the economic level of development of the host country receiving international students. By attracting international students, high-income countries deplete the human and intellectual potential of other nations if these countries lack attractive conditions for the return of the majority of students who have obtained their education abroad.

The average level of outbound academic mobility in countries with a low GNI per capita was the highest in 2012–2021 (3.960) and almost twice (1.713) higher than in high-income countries (Table 2).

Table 1. Analysis of variance of the relationship between the levels of inbound academic mobility and economic development of the country

Source: Calculated based on UNESCO (n.d.a).

ANOVA: Single Factor				
Groups	**Count**	**Sum**	**Average**	**Variance**
Lower middle-income countries	10	5,45564	0.545564	0.001039
Middle-income countries	10	8.17393	0.817393	0.007673
Upper middle-income countries	10	9.99666	0.999666	0.016247
High-income countries	10	70.55518	7.055518	1.108806

ANOVA						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Groups	295.7009278	3	98.56697593	347.7507	0.00	2.86627
Within Groups	10.20389299	36	0.283441472			
Total	305.9048208	39				

Table 2. Analysis of variance of the relationship between the levels of outbound academic mobility and economic development of the country

Source: Calculated based on UNESCO (n.d.a).

ANOVA: Single Factor				
Groups	**Count**	**Sum**	**Average**	**Variance**
Low-income countries	9	35.64118	3.960131111	0.454617
Lower middle-income countries	10	20.67902	2.067902	0.134804
Middle-income countries	10	19.51297	1.951297	0.037978
Upper middle-income countries	10	18.752	1.8752	0.008634
High-income countries	10	23.12159	2.312159	0.018751

ANOVA						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Groups	27.8533946	4	6.96334865	56.33735	0.00	2.5837
Within Groups	5.43844035	44	0.123600917			
Total	33.291835	48				

The variation in outbound academic mobility is 83.7% related to the economic level of development of the host country receiving international students. Outbound mobility is higher than average for the groups of countries with the highest and lowest income levels. However, the motivations for studying abroad and the intentions to return to their home country differ significantly and require additional analysis.

Thus, findings obtained within checking *H1* are consistent with the results of other researchers. Particularly, young people seek countries with high living standards; and vice versa – the leakage of intellectual capital is typical for donor countries with lower levels of economic development (Aliyev et al., 2023; Benček & Schneiderheinze, 2024; Hrynkevych & Lutchyn, 2017; Kersan-Škabić & Blažević Burić, 2022).

To verify *H2,* the first step was to determine the migration dynamics of Ukrainian students and their geographical distribution according to available statistics data (UNESCO, n.d.a).

As shown in Figure 1, Ukraine was part of a group of countries with relatively balanced academic mobility indicators on the global map in the pre-war period. The percentage of international students in Ukraine constituted 4.9% of the total student population, while the share of Ukrainian students studying abroad was 6.1%. A noticeable increase in outbound academic mobility occurred after 2015, against the backdrop of russia's armed invasion of Crimea and the eastern regions of Ukraine. During 2014–2015, the outbound academic mobility from Ukraine has increased from 2.3% to 3.8%.

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Source: Developed based on UNESCO (n.d.a).

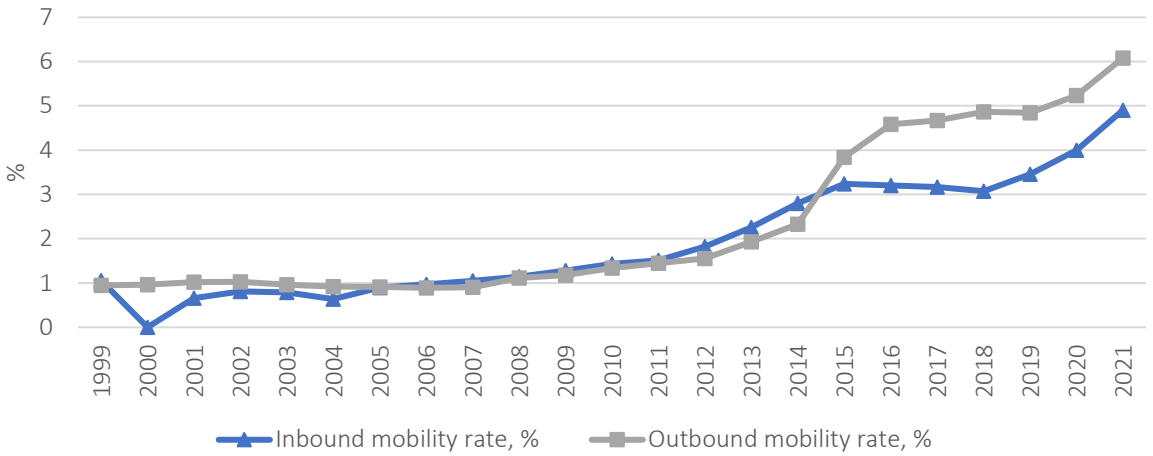

Figure 1. Dynamics of international academic mobility in Ukraine

The migration directions of Ukrainian students show a steady trend. Table 3 shows the geographical structure of the host countries attracting between 70% and 85% of students from Ukraine in 2017–2021. Russia and Belarus are excluded, as the migration flows of Ukrainian students to these countries have not been relevant since 2022, and the analysis itself is not useful for borrowing positive experiences.

Most Ukrainian students studied at universities in Poland (35-45% of all domestic educational migrants), Germany (8-9.3%), and Czechia (3.9-6%) before the full-scale war. There are five countries where the flow of Ukrainian students has been increasing yearly: Lithuania, Latvia, Slovakia, Bulgaria, and Czechia (except for 2019).

Table 3. Dynamics of Ukrainian students by country of study

Source: Developed based on UNESCO (n.d.a).

Country	2017		2018		2019		2020		2021	
	1	2	1	2	1	2	1	2	1	2
Poland	34692	54.3	26864**	49.4**	26938*	48.8**	27068*	43.6**	30903*	41.8**
Germany	6148	2.4	6481*	2.1*	6313**	1.9**	6759*	1.8**	6571**	1.7**
Czechia	3015	6.8	3233*	7.2*	3132**	6.8**	3811*	8*	4246*	8.3*
Italy	2775	2.8	2950*	2.8	527**	1**	557*	1	767*	1.1*
USA	1744	0.2	1911*	0.2	...	...	1818**	0.2	1715**	0.2
Austria	1357	1.8	1426*	1.9*	1450*	1.9	1455	1.9	1556	1.9
France	1339	0.5	1075**	0.5	1120*	0.5	1030**	0.4**	930**	0.4
Slovakia	1265	11.8	1965*	16.9*	2911*	22.9*	3949*	27.7*	4916*	31.8*
Hungary	1193	4.2	1168**	3.6**	1202*	3.4**	1207*	3.1**	1171**	3.1
Canada	1146	0.5	1230*	0.5	1314**	0.5	1344*	0.4**	1212**	0.4
UK	910	0.2	845**	0.2	838**	0.2	827**	0.2	866*	0.1**
Bulgaria	678	4.9	850*	5.6*	1021*	6.2*	1197*	6.8*	1345*	7.4*
Turkey	579	0.5	612*	0.5	629*	0.4**	610**	0.3**	589**	0.3
Spain	410	0.6	418*	0.6	483*	0.6	396**	0.5**	379**	0.5
Switzerland	358	0.7	355**	0.7	353**	0.6**	322**	0.6	323*	0.5**
Romania	332	1.2	435*	1.5*	513*	1.7*	572*	1.8*	491**	1.5**
Greece	246	1	270*	1	270	1	230**	1	285*	1.2*
Latvia	242	3.9	252*	3.3**	372*	4.4*	557*	5.5*	791*	7.9*
Estonia	233	6	260*	5.9**	281*	5.6**	299*	5.4**	278**	5.3**
Lithuania	208	3.6	323*	5.1*	547*	8.2*	606*	9.2*	732*	9.5*
Total	76622		77218		74315		68275		70963	

Note: 1 – number of Ukrainian students; 2 – % Ukrainian students among other international students; * – Increase in the indicator compared to the previous year; ** – Decrease in the indicator compared to the previous year.

In addition, Table 3 shows the share of Ukrainian students in the total number of international students in the host countries. The largest share of Ukrainians among international students is in Poland (41.8-54.3%), Slovakia (11.8-31.8%), Czechia (6.8-8.3%), Bulgaria (4.9-7.4%), Estonia (5.3-6%), Lithuania (3.6-9.5%), Latvia (3.9-7.9%), and Hungary (3.1-4.2%). The proportion of Ukrainian students in HEIs in other countries is insignificant (less than 2%).

The next stage is to compare the total number of Ukrainians who have immigrated to different countries of the world (using MPI (2020) data) and the number of educational immigrants from Ukraine (UNESCO, n.d.a). Based on official data for 2020, countries were ranked according to their level of migration attractiveness. Figure A1, Appendix A, shows the rank of the country by the number of immigrants and the rank of the country by the number of students. The largest flow of immigrants from Ukraine was to the USA, Germany, Poland, Italy, and Czechia; and the largest inflow of Ukrainian educational migrants was to Poland, Germany, Slovakia, Czechia, and the USA. Thus, before the outbreak of the full-scale war, migration flows of Ukrainian students were largely in line with the general migration trends of Ukrainians, which confirms *H2*.

This tendency in flows of Ukrainian students, which generally followed the dynamics of migration of the Ukrainian population, confirms the applicability of the migration network theory, as in the findings of Blumenstock et al. (2023), Giulietti et al. (2018), McKenzie and Rapoport (2010), and Munshi (2020).

Further, a correlation analysis was used (Table 4). Given that at the time of this study, the latest data on certain factors (the number of Ukrainian students) were available only for 2021, the analysis was conducted using statistics for this year. For comparability, indicators from other sources were also used for 2021.

Table 4 concludes that *H3* can be confirmed only partially, due to the moderate links of Ukrainian student migration with employment and socio-economic resilience factors. Therefore, in contrast to global trends of choosing countries with high economic development, such motives were not confirmed in the case of Ukrainian students. Similarly, the importance of security factors, freedoms (personal and economic), prestigious universities, and large corporations – all those factors that are important in the long run – did not prove true. Ukrainian educational migrants value short-term benefits in the form of employment opportunities (even without considering high potential earnings) and socio-economic sustainability, which, among other indicators, includes respect for gender equality, labor rights, and social protection services. The same is true regarding the high relevance of the quality of higher education (as a constituent of X_9). Thus, the findings obtained are not aligned with the results of Abbas et al. (2021), Elken et al. (2023), and Fakunle (2021). The common features of Ukrainian students' migration intentions with those found in the global migration dimension are manifested only in the rather high importance of employment prospects. These findings are corresponding to those of Khalid and Urbański (2021), Nayak (2023), Potuzakova and Bilkova (2022), Radu et al. (2023), and Tran et al. (2020).

Table 4. Correlation coefficients between the number of Ukrainian students and selected indicators of social and economic development

Source: Own calculations based on UNESCO (n.d.a, n.d.b), ILOSTAT (2021), Metreau et al. (2024), OECD (2021), Vásquez et al. (2023), WEF (2021).

Resulting Indicator		Correlation coefficient between resulting and impact indicators								
		GNI per capita	Employment rate	Average annual wages	Personal freedom	Economic freedom	Human freedom	Safety and security	Socio-economic resilience and conditions	Non-leisure resources
		X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9
Number of Ukrainian students	Y	−0.147	0.426	−0.116	0.029	−0.221	−0.033	0.072	0.371	0.002

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Such results confirm the higher subjective value of the current situation than of (after graduation) prospects and may be an indirect sign of the migration network operation, which can provide students with current conditions of stay.

Ukraine and international organizations do not have up-to-date and official statistics on Ukrainian students studying abroad since the beginning of russia's full-scale invasion. This dramatically complicates the qualitative and quantitative analysis of the factors of Ukrainians' choice of countries, areas of study and HEIs, conditions of adaptation, and sentiments about returning to Ukraine starting in 2022, as envisaged in *H4*.

In the meantime, there are many special studies in the form of surveys, analytical reports by Ukrainian and international organizations, and publications by educational agencies that provide educational (preparation for admission, foreign language courses), consulting, legal, and other types of services for studying abroad. In particular, according to Khomenko (2023), in 2022 and 2023, the greatest demand among Ukrainians was for English-language higher education programs at universities in the UK, the Netherlands, and Poland.

Therefore, six countries were selected for qualitative analysis of the factors that attract Ukrainian students to study abroad: Poland and Germany (countries with the largest number of Ukrainian students), Lithuania and Slovakia (countries characterized by a constant annual increase in Ukrainian educational migrants), the Netherlands and the United Kingdom (countries whose universities were in greatest demand in the Ukrainian market in 2022–2023, according to educational agencies).

The choice of countries for Ukrainians to study in largely depends on the policy of these countries toward foreigners, the level of language proficiency, tuition and accommodation costs, free education opportunities, the right to work, and the country's proximity to the border with Ukraine (Table A2, Appendix A). Universities in Poland, Slovakia, the Netherlands, and the UK permit students to combine study and work, which allows them to earn money for living, which is expensive abroad. Additionally, university graduates are given time to search for a job and are granted work permits. In the UK, they have a 2-year post-study work visa with a possible extension, in the Netherlands – 1 year after a Bachelor's degree and 1 year after a Master's degree with a possible extension; in Poland – 3 months to obtain a work visa to stay in Poland. Special programs of state support for international students, including Ukrainian refugees in Lithuania (Table 4), have led to a significant increase in academic migration from Ukraine. This has caused a mixed reaction from the Ukrainian government and the public and forced the Lithuanian government to introduce conditions for Ukrainians to enter higher education institutions under the same rules as for Lithuanian citizens since September 2024. These results confirm *H4* regarding the importance of government instruments for attracting international students, albeit with specific national differences in educational policies.

CONCLUSION

The study investigated the peculiarities of Ukrainian student migration before and after the outbreak of the full-scale war against the background of global patterns of academic migration.

On the global map of academic migration in the pre-war period, Ukraine belonged to a group of countries with relatively balanced flows of inbound and outbound international academic mobility. The most attractive countries for Ukrainian students were Poland, Germany, the USA, and Czechia. The distribution of students' flows is typical for the general distribution of migrants from Ukraine, confirming the high validity of the migration network theory.

An analysis of the variation in the students' flows for groups of countries by level of gross national income per capita revealed significantly higher inbound academic mobility for advanced economies. At

the same time, outbound academic mobility is high for both the highest- and lowest-income countries. However, the motives for going abroad to study and the intentions to return to their home country differ significantly. In addition, low-income countries lack adequate social and economic conditions for students to return, have low levels of inbound mobility, and lose human and intellectual resources.

Ukraine risks losing human and intellectual capital due to the accelerated growth of outbound academic mobility. The motives of youth emigration for study purposes, even in the period before the active phase of the war, did not confirm the assumption that they were looking for exclusively better study conditions, including the quality of higher education. At the same time, the assumptions about the high importance of factors important for the formation of long-term ties with the host country for Ukrainian students have not been confirmed: the socio-cultural environment, respect for rights, security of residence, and other non-economic factors have no proven impact on the formation of migration flows. These results indicate that students focus on the current situation rather than on long-term prospects.

Additionally, the intensification of educational policies of several host countries toward migrants has played an important role in shaping migration intentions. Even before the active phase of the war, international academic mobility of students intensified under the influence of European integration processes in the educational space. The intensification of russian military aggression has led to an increase in the imbalance in international academic mobility in Ukraine. This imbalance is exacerbated by the policies of the EU and other countries, which are focused on creating the most attractive conditions for international students to study and solving their socio-demographic problems at the expense of Ukrainian students. In such circumstances, Ukraine needs to develop and implement an active policy of social, psychological, financial, and other types of support for participants in the educational process to ensure their safety and attractiveness for learning and development.

This study was carried out in the context of significant information limitations related to both the specifics of revealing international information on academic migration and the publication of statistics in Ukraine during the war. However, considering the long-lasting war in Ukraine and its influence on population behavior, the results are useful for understanding the factors of students' youth migration activity. They can contribute to the development of migration policies. Besides, the best practices of attracting and supporting students can improve Ukraine's educational management in the context of war.

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APPENDIX A

Table A1. Grouping of countries by the indicator of balanced level of academic mobility (as of 2021)

Group of countries with balanced indicators of international academic mobility				Group of countries with balanced indicators of international academic mobility				Group of countries with the dominant level of outward academic mobility			
Countries	IMR, %	OMR, %	IMR/OMR	Countries	IMR, %	OMR, %	IMR/OMR	Countries	IMR, %	OMR, %	IMR/OMR
Portugal	11.66	5.9	1.98	Australia	21.89	0.73	29.88	Burkina Faso	1.91	4.23	2.22
Latvia	12.76	6.5	1.96	The United Kingdom of Great Britain and Northern Ireland	20.06	1.32	15.15	Croatia	2.66	6.48	2.43
Malaysia	8.07	4.26	1.9								
Spain	3.58	2.07	1.73					Mauritius	6.71	17.26	2.57
Georgia	9.06	5.73	1.58								
Mexico	1.03	0.66	1.57								
Estonia	11.62	7.74	1.5	Argentina	3.16	0.27	11.69	Bosnia and Herzegovina	6.65	18.14	2.73
Ireland	9.29	6.35	1.46	The United States of America	4.59	0.57	8.11				
Lebanon	12.4	8.67	1.43					Morocco	1.87	5.48	2.93
Jordan	12.33	9.09	1.36	The Netherlands	13.72	1.87	7.34				
Panama	2.65	2.01	1.32	New Zealand	11.98	1.77	6.76	The Republic of Moldova	6.47	20.72	3.2
The Republic of Korea	4.08	3.1	1.31	Canada	17.37	2.69	6.46				
Saudi Arabia	4.03	3.17	1.27	Denmark	9.99	1.89	5.28	Algeria	0.62	2.1	3.4
Bahrain	11.66	10.22	1.14	Kyrgyzstan	23.05	5.16	4.46	Ghana	0.91	3.5	3.83
Romania	6.03	6.12	0.98	Türkiye	2.71	0.63	4.29				
Chile	1.31	1.43	0.92	Czechia	15.57	3.75	4.16	Brazil	0.24	0.94	3.91
Senegal	6.28	7.19	0.87	The Dominican Republic	2.37	0.7	3.37	Oman	3.08	14.1	4.57
Norway	4.17	4.81	0.87								
Italy	3.45	4.06	0.85	Switzerland	18.43	5.64	3.27	China	0.41	1.9	4.61
Belarus	6.47	7.72	0.84	Austria	18.72	5.79	3.23	Albania	1.69	11.41	6.76
Armenia	5.91	7.07	0.84	Belgium	9.83	3.18	3.09				
Ukraine	4.9	6.08	0.81	Germany	11.23	3.77	2.98	Samoa	4.04	31.43	7.79
Uruguay	2.34	2.96	0.79	Hungary	13.19	4.79	2.76	Azerbaijan	2.28	19.31	8.48
Lithuania	7.33	9.37	0.78	Poland	5.49	2.03	2.7	India	0.12	1.31	10.58
Israel	3.35	4.56	0.74	South Africa	2.92	1.09	2.68				
Serbia	4.51	6.21	0.73					Colombia	0.2	2.34	11.55
Bulgaria	8.01	11.17	0.72	Malta	16.47	6.34	2.6	Cambodia	0.26	3.73	14.43
North Macedonia	7.43	10.66	0.7	Slovenia	9.2	3.73	2.47	Vietnam	0.32	5.16	16.37
Iceland	7.9	12.6	0.63	Finland	8.08	3.37	2.4				
Greece	2.82	4.81	0.59	France	9	3.77	2.39	Sri Lanka	0.36	8.34	23.43
Botswana	2.47	4.45	0.55	Cuba	2.18	0.93	2.35				
Slovakia	10.97	22.06	0.5	Sweden	6.64	2.88	2.31	Uzbekistan	0.73	19.15	26.06

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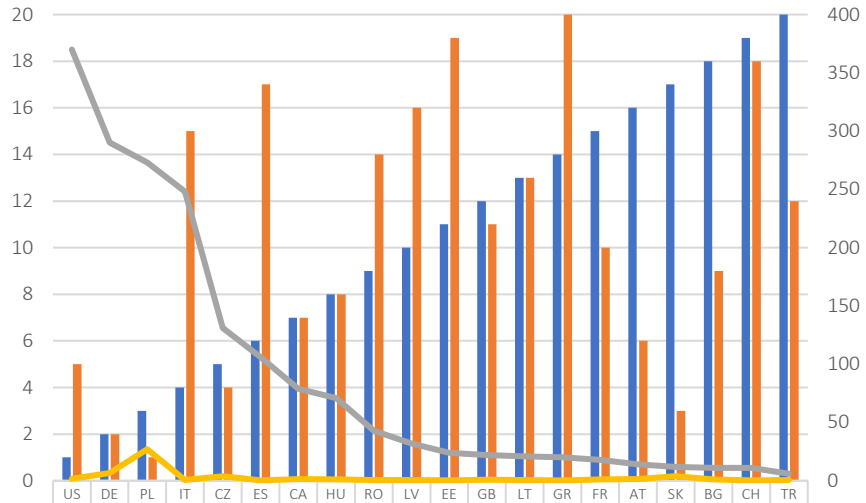
Source: Developed based on UNESCO (n.d.a), MPI (2020).



	US	DE	PL	IT	CZ	ES	CA	HU	RO	LV	EE	GB	LT	GR	FR	AT	SK	BG	CH	TR
rank of the country by the number of immigrants	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
rank of the country by the number of students	5	2	1	15	4	17	7	8	14	16	19	11	13	20	10	6	3	9	18	12
number of students (thousand)	370	290	273	248	131	106	79	71	43	32	24	22	21	20	18	14	12	11	11	6
number of immigrants (thousand)	1.82	6.76	27.07	0.56	3.81	0.40	1.34	1.21	0.57	0.56	0.30	0.83	0.61	0.23	1.03	1.46	3.95	1.20	0.32	0.61

Note: Country codes according to the ISO 3166-1: The USA (US), Germany (DE), Poland (PL), Italy (IT), Czechia (CZ), Spain (ES), Canada (CA), Hungary (HU), Romania (RO), Latvia (LV), Estonia (EE), the Great Britain (GB), Lithuania (LT), Greece (GR), France (FR), Austria (AT), Slovakia (SK), Bulgaria (BG), Switzerland (CH), Türkiye (TR).

Figure A1. Correlation between the ranking of the main host countries by the level of immigration, including students, and the number of immigrants, including students

Table A2. Conditions for studying abroad for foreign, including Ukrainian students in selected countries

Source: DAAD (2022, 2024), Khomenko (2023), VisitUkraine (2024), Osvita (n.d.), Global Study (n.d.), Edusteps (n.d.).

Country	Entry requirements	Opportunities to study free. Grants. Scholarship programs	Other peculiarities
Poland	Admission to Polish universities is based on a certificate of complete secondary education (sometimes an additional apostille is required) and Polish language proficiency of at least B1 (English – at B2 level). Sometimes, it is necessary to prepare a portfolio of creative works, motivational letters, etc. There are no entrance exams (there may be a language interview).	Foreigners with C1-level Polish language skills (confirmed by a certificate) can apply for free education in Polish at any public university. The same applies to Ukrainian refugees who have been granted temporary protection in Poland after 24.02.2022 and hold a pesel UKR. Some candidates with pesel UKR can also count on a discount when choosing an English-language program. Many Polish universities offer up to 50% discount on tuition fees for applicants from Ukraine. Many scholarship programs in Poland offer free education for Ukrainians. The government, Polish universities, international organizations, and charitable foundations can provide scholarships.	International students can work up to 20 hours a week during their studies and have a full-time job during the holidays. Most universities have contracts with international companies and organize paid internships. Some universities support work-study programs with the following options: 1) a student works at a company for 3-4 months, and the company pays for their education for the next 3-4 months; 2) 3 days of study and 2 days of practice. Within 3 months, university graduates can apply for a work visa to stay in Poland for 9 months to look for a job. After working for a certain period in Poland, a student can apply for permanent residence or citizenship.
Germany	Ukrainians can enter German universities either after one year of study at a Ukrainian university or after finishing a one-year preparatory course at a German Studienkolleg. To apply, one needs to provide a C1-level certificate of German language proficiency.	International students are entitled to free tuition at public universities for Bachelor's and most Master's courses, except for certain continuing education Master's programs, but they are not particularly high. Private higher education institutions may demand more substantial fees for their degree programs, which range from 5,000 annually for Bachelor's programs per year. Scholarship programs: 1) DAAD is a scholarship for studying in Germany. The program is designed for university graduates with a Bachelor's degree or higher and the intention to receive postgraduate or Master's education at a public university; 2) Erasmus Mundus – a program of the European Commission. It is designed for students (after 2 years of studying at a higher education institution) and teachers who wish to study under an exchange program.	Students from abroad must provide proof of financial resources to obtain a study visa. As of January 2023, this amount is set at 11,203 EUR. However, Ukrainian nationals registered as refugees due to the russian federation's ongoing aggression against Ukraine are exempt from needing a study visa. Since June 1, 2022, Ukrainian students studying at German universities – whether public or private – may also be eligible for financial assistance through BAföG to support their studies in Germany. In the Federal State of Baden-Württemberg, non-EU citizens must pay tuition fees of 1,500 EUR per semester for Bachelor's, Master's, Diplom, and state examination degree programs. These fees do not apply to doctoral students. However, since the start of the war, these fees have been waived for Ukrainian students. All students are required to pay a semester contribution (Studentengebühr), which ranges between 100 and 350 EUR, before the start of each semester. This fee covers student services, student government, and a semester ticket for public transportation in the region.
Lithuania	Since September 2024, Ukrainians will be admitted to higher education institutions under the same rules as Lithuanian citizens.	Ukrainians can apply for government-funded positions at public higher education institutions through general competition. International students, including those from non-EU countries, are eligible to apply for government-funded postgraduate programs. International students can apply for a state scholarship. In most cases, the scholarship covers both tuition fees and living expenses. Financial conditions depend on the applicant's country of origin. Depending on academic performance, students may receive a personal grant from the university.	From the beginning of the full-scale invasion until September 2024, all refugees from Ukraine could study at Lithuanian universities for free without competition. Since September 2024, such programs have been canceled at the request of the Ukrainian government in order not to encourage a brain drain from Ukraine. Ukrainian students who entered Lithuanian higher education institutions in 2023 or earlier can complete their studies free of charge. In 2022–2024, 11 million euros were allocated to finance the education of Ukrainian students.

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Table A2 (cont.). Conditions for studying abroad for foreign, including Ukrainian students in selected countries

Country	Entry requirements	Opportunities to study free. Grants. Scholarship programs	Other peculiarities
Slovakia	It is possible to enter certain faculties without passing the external independent evaluation and entrance exams. Free tuition requires basic knowledge of the Slovak language (certificate).	There is a bilateral agreement with Slovakia on the possibility of studying the Slovak language free of charge. Tuition fees are charged for English-language programs. International students are eligible to apply for a scholarship while studying under the National Scholarship Program approved by the Government. Each university has its additional scholarship programs. The main condition for receiving a scholarship is successful study.	The financial costs of living in Slovakia while studying are low compared to other EU countries. Special advantages include an ecologically clean environment, proximity to the border with Ukraine, and the ability to obtain a residence permit with subsequent official employment. International students who have obtained a residence permit during their studies have the right to work officially for 20 hours a week.
Great Britain	One can apply to British universities if one has at least 13 years of previous education (this includes school and the first two years of university) and an IELTS or TOEFL language certificate with a score set by the institution. Therefore, after graduating, Ukrainians can either enter domestic universities and study for 1-2 years or complete one of the preparatory programs in the UK and then apply to a university.	Ukrainian students can apply for scholarships and grants to study undergraduate, Master's, and doctoral courses at British universities. Students with financial problems may be eligible for grants and maintenance allowances. UK universities also offer scholarships and grants for special achievements, such as sports or science. Students can also apply for funding for their projects. Scholarships are provided by the British Council, the UK government, universities, colleges, and numerous private foundations.	University students are permitted to get a job and work 20 hours per week during the semester and up to 40 hours per week during holidays. In the UK, special programs allow working and attending classes periodically, including Degree Apprenticeship, a hybrid learning program (online/offline format). The country also has sandwich programs that provide one year of internship in a company in the major field of study without interrupting university studies. During the internship, students do not pay tuition fees. University graduates receive a two-year post-study work visa to work in the UK. The visa is valid for two years and can be extended.
The Netherlands	Foreigners can enter Dutch universities without entrance exams. Selection is based on academic performance. The minimum English language level required for admission is B2 or higher. However, before entering research universities, Ukrainian school graduates must complete a one-year Foundation program.	Up to 50% of the tuition fee was paid for Ukrainians in 2022, but the benefits for Ukrainian students were canceled in 2023. In cooperation with 48 universities, the Dutch government has introduced a scholarship to attract many international students. The scholarship is intended for those who obtain a Bachelor's or Master's degree. Each scholarship is worth €5,000 and will be awarded to students in their first year of study to cover their education costs. Tuition scholarships are available for students from countries outside the European Economic Area.	University students are allowed to work part-time during their studies (10 hours per week) and during holidays (40 hours per week). Dutch university graduates can stay in the country for a year to find a job in their chosen field of study. This opportunity is provided to those who get first and second higher education. Thus, a student who studied for a Bachelor's degree and then completed a Master's degree in the Netherlands has the right to stay in the country for 2 years. After that, they can apply for a work permit as a researcher or a highly qualified specialist. After 5 years in the country, they can get a residence permit.