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MIGRATION ASPIRATIONS OF UKRAINIAN SCIENTISTS IN WARTIME CIRCUMSTANCES: EXPECTATIONS AND OPPORTUNITIES FOR PROFESSIONAL DEVELOPMENT

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ABSTRACT. The study aims to identify the migration expectations and aspirations of Ukrainian scientists amidst the backdrop of war. Conducted at the end of the first year of war, the research evaluates the behavioural responses of a demographic with the substantial intellectual facing profound life changes in life circumstances, the need to adapt to a new lifestyle and environment, and to find a response to extreme changes, the imperative to adapt to new environments, and the necessity to navigate extreme shifts in career and life opportunities. The findings derive from a representative survey of the target group (comprising 389 respondents) conducted over a one-month period (February 18 to March 15, 2023) using a Google Forms questionnaire. The study reveals a strong inclination among scientists residing in relatively safe regions of Ukraine (49%) and those who relocated abroad (42%) to persist in their research endeavours. Remarkably, the duration of the war does not significantly influence scientists' career aspirations. Notably, age exhibits a discernible correlation with professional objectives: older respondents express greater intentions to pursue educational activities should the conflict persist. Career prospects for respondents predominantly centre on Ukraine, with a markedly pessimistic outlook on integration into the global occupational sphere: the likelihood of securing employment abroad commensurate with their profession is rated at 4.9 out of 10. There is also a notable readiness among respondents to consider changing their field of occupation entirely (5.4 points) or to discontinue research activities (6.5 points) in case of a protracted war. These results are pivotal for comprehending behavioural dynamics and shifts in career aspirations under conditions of war, and for devising policies that support and foster scientists amidst heightened risks.

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JEL Classification: F22, J21, O15 ***Keywords***: migration, intellectual migration, scientists, war.

Introduction

Unlike many other risks to the reproduction of human capital, the impact of war is invariably negative. Military conflicts affect the entire populations of the involved countries, resulting not only in the loss of thousands of lives but also significantly hindering scientific progress in these countries (Wolfsberger et al., 2023). The ongoing full-scale war in Ukraine has disrupted the lives of millions of Ukrainians, and has profoundly impacted the country's educational and scientific community. Faced with uncertainty and seeking safety, many Ukrainian academics are compelled to seek refuge abroad leading to a widespread emigration of intellectual capital. The concept of the "displaced academic," which emerged following russia's annexation of Crimea and invasion of Donbas in 2014 (Oleksiyenko et al., 2021), has gained renewed relevance in Ukraine and globally since February 24, 2022. Data indicate that by the fall of 2022, about 18.5% of Ukrainian scientists had fled the country, with these emigrant scientists being among the most active in research (De Rassenfosse et al., 2023). As of January 2024, about 12% of Ukrainian scientists and university teachers had been forced to emigrate or relocate internally. Approximately 30% of all Ukrainian scientists have been compelled to work remotely (UNESCO, 2024). As of January 2024, the primary destinations for Ukrainian scientists included Germany, Poland and the United Kingdom (Figure 1).

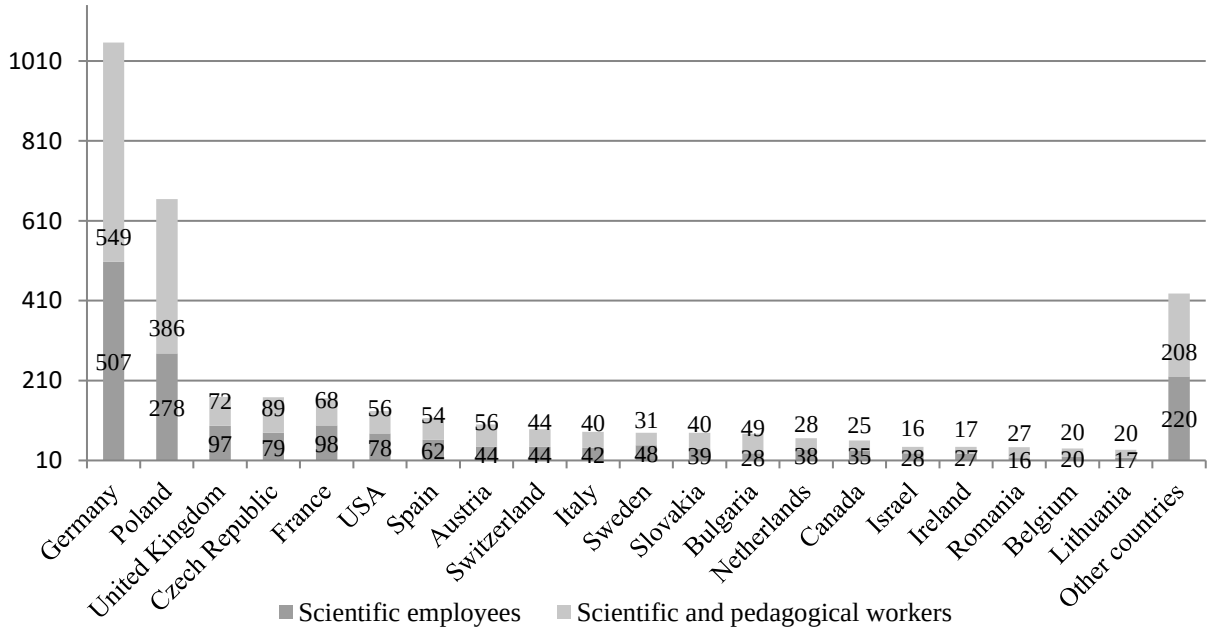

Figure 1. Number of Ukrainian scientists and educators living abroad by host country as of January 2024 (UNESCO, 2024).

Of course, international mobility of academics is closely intertwined with academic career management. Such movement is indeed a crucial and often integral aspect of academic and research careers. However, when these migration flows are highly asymmetric (resulting in

negative balance between arrivals and departures), intense, permanent and long-term, the mobility of scientists is perceived as a "brain drain" that detrimentally impacts economic growth and diminishes returns on investment in human capital development in the country of origin (Bilan et al., 2024; Neiva Ganga et al., 2018; Radu et al., 2023). International migration patterns demonstrate significant impacts on economic development trajectories, with research confirming that migration and remittances have substantial positive effects on employment sectors and overall economic growth in developing countries (Ceesay, 2020). Influenced by the intensification of migration processes, forced intellectual migration is often examined within the context of addressing issues concerning refugees and internally displaced persons (Alwrekiat et al., 2023; Kochaniak et al., 2024; Yurchyk et al., 2023), capitalising on the migration of specialists possessing high intellectual and entrepreneurial potential (Aliyev et al., 2023; Andersson, 2019; Sabary et al., 2023; Urbański, 2021). However, the migration intentions and professional expectations of scientists, as a distinctive group of highly skilled individuals, warrant special attention during times of war. In the current era characterised by rapid innovation development, such migrants can significantly influence economic outcomes in both donor and recipient countries.

In light of this, the aim of our study is to assess the migration expectations and career aspirations of Ukrainian scientists amidst war. Empirical analysis is crucial for gaining deeper insights into the issue and exploring potential solutions. Moreover, our study contributes to addressing the vulnerability of science in a novel manner: by analysing scientists' migration intentions at the end of the first year of the war, we scrutinised the behavioural responses of a population group possessing the highest intellectual potential, grappling with the shock of life-altering circumstances, adapting to new lifestyles, and seeking to navigate extreme changes in life and career opportunities. Choosing a secure place of residence amidst the prospect of losing (or risking the loss of) career prospects poses a daunting dilemma for intellectuals who have invested significantly in developing their professional expertise. This decision often entails uncertainty regarding personal career prospects and can lead to macroeconomic losses or foregone benefits for the country of origin. Hence, evaluating professional motivations to sustain careers and assessing readiness for making complex decisions under the pressure of peril are pivotal for understanding the nuances of behavioural changes and shifts in career aspirations among a population group characterized by its highest intellectual potential. Such insights are crucial for formulating policies that support and cultivate scientists in the face of heightened risks, as examined in our study within the context of war.

Our study builds upon the groundwork laid by scholars who have investigated intellectual migration, particularly in contexts influenced by war, as discussed in the Literature review section. For the empirical segment of the research, the authors conducted a sociological survey and analysed its findings using typical statistical methods for such purposes – further details are provided in the Methodology section, while the results of hypotheses testing are presented in the Results section. A summary of our findings is encapsulated in the Conclusions section.

1. Literature review

Research on the migration of scientists constitutes a significant area of inquiry within the realm of intellectual migration in Ukraine and globally. In Ukraine, such studies chronicle distinct periods of societal development that have shaped professional opportunities. For instance, Karmadonova (2023) delineates three periods in research on the migration patterns of Ukrainian scientists: the post-Soviet period (1991-2012), the post-revolutionary period (2013-2021), and the period of full-scale war (since 2022). Migration drivers vary across these periods

(Chugaievska & Wisła, 2023; Zhuk et al., 2023). During the current ongoing third period, which commenced in 2022 and persists, scientists are leaving Ukraine due to the perceived risks associated with the ongoing war. The primary destinations for migration are EU countries, offering opportunities for academic collaboration, secure living conditions, and are highly appealing to intellectual migrants (Oliinyk et al., 2022). Understanding the timing of migrants' decisions to relocate during armed conflicts is crucial. Schon (2019) underscores the role of violence in shaping decisions related to forced migration. However, migration timing often diverges from the timing of violent events. Drawing on data from over 170 structured interviews, the author argues that respondents who did not directly witness violence (early motivation) tended to leave their homes an average of six months earlier. These findings align with the proportional risk model: respondents tended to migrate at the onset of conflict if they possessed both motivation and the financial means to do so.

Under wartime conditions, the work of researchers and scientists undergoes rapid transformation. Alongside new risks, novel aspects of conducting research emerge. Chacón-Labella et al. (2021) present eight key strategies to assist researchers in navigating uncertainty, fears, and challenges during crisis periods. Innovative, collaborative, and open science-oriented developments arising from the crisis can shape plans for rethinking collaboration within academic circles. Under such conditions, scientists envision opportunities for further research. Their expertise includes personal strategies for adapting to the new reality, maintaining focus, fostering project resilience, and utilising various tools that facilitate remote work. Online communication platforms for accessing conferences and networking support academic collaboration (Kolot et al., 2020). During crisis, stakeholders in research institutions and universities must realign their responsibilities to minimise the vulnerability of personnel and mitigate instability within war-affected academic communities (Oleksiyenko et al., 2023).

According to a recent survey conducted as part of the UA Science Reload project, 83.8% of Ukrainian scientists have experienced a deterioration in their financial situation. Specifically, 39.7% of scientists indicated they have sufficient funds only for food, while 27.7% mentioned having enough for food and clothing, but struggle to afford items for long-term use (Lutsenko et al., 2023b). The difficult economic situation faced by Ukrainian scientists warrant discussion on the reduced opportunities to secure funding for publishing their scientific findings. Furthermore, 29.1% of scientists reported that projects have been suspended or face implementation challenges due to the war (Harashchenko et al., 2022). Under such conditions, the top 10% of the most prolific scientists – those dedicating over 20 hours per week to research and those with the highest academic qualifications – are significantly more likely to emigrate from Ukraine compared to their counterparts (De Rassenfosse et al., 2023).

Data collected by Ganguli and Waldinger (2023) indicates that the war has significantly affected Ukraine's scientific community, with a 10% decrease in research publications by Ukrainian scientists in 2022 compared to 2021. Given the typical delays in publishing scientific articles, the medium- and long-term implications of the war on Ukrainian scientific output are expected to be even more pronounced.

Daily life, characterised by sudden air raid sirens, bombings, displacement to shelters or underground bunkers, caregiving responsibilities, safety related to the war, and exposure to continuous negative news, creates an environment that is not conducive to concentration or productive engagement in scientific research (Nazarovets & Teixeira da Silva, 2022). Nearly all academic staff at Ukrainian universities (97.8%) reported deteriorating psycho-emotional states, including depression (84.3%), exhaustion (86.7%), loneliness (51.8%), nervousness (84.4%), and anger (76.9%). There has also been an increase in substance use (e.g., tobacco, alcohol, pain relievers, and sedatives), alongside feelings of fear, burnout and reduced resilience (Kurapov et al., 2023). The safety situation during wartime critically impacts the feasibility of

conducting further research for Ukrainian researchers (Tsybuliak et al., 2024). A significant majority (72.9%) of scientists are unable to engage in research activities to the same extent as in pre-war times. The primary reasons cited for this inability include: 1) lack of feeling safe (46.6%); 2) inability to access their workplace due to its specific location (31.7%); 3) technical constraints (30.0%); and 4) lack of interest or apathy (28.8%) (Lutsenko et al., 2023a). The proportion of scientists unable to fully engage in scientific activities is lower in regions like Kyiv and where there is no direct conflict, but highest in combat zones. Motivations for publishing scientific articles vary from sharing research findings with colleagues out of scientific interest to meeting institutional requirements or avoiding dismissal, among other factors. Approximately 20% of scientists indicated a lack of motivation for scientific activities and publications (Fiialka, 2022).

Suchikova et al. (2023) established a correlation between the location of Ukrainian scientists and their ability to engage in scientific activities, identifying factors that reduce scientific efficiency during wartime. The sample consisted of 172 lecturers from Berdyansk State Pedagogical University, Ukraine. Initially located in temporarily occupied territory at the war's onset, the university later relocated to Zaporizhzhia. Forty-point-eight percent of respondents who moved from the temporarily occupied territory to areas controlled by Ukraine noted a decrease in the efficiency of their scientific activities. Additionally, 33.8% could not even contemplate engaging in science at all. The most challenging situation was among those who emigrated abroad: 55.6% showed reduced scientific activity, while 27.7% reported its complete absence (Suchikova et al., 2023). According to the Survey on the Needs of Ukrainian Scientists (Lutsenko et al., 2023b), 53.2% of the interviewed scientists remained in Ukraine and did not change their place of residence despite the war. Another 34.8% of the respondents were internally displaced, with 52.8% of them returning to their pre-military invasion settlements. The survey also found that 12% of the scientists were abroad at the time of the survey.

Currently, the international community unanimously acknowledges the need to assist Ukrainian scientists fleeing combat zones, with socially responsible national and international scientific organisations, as well as individual scientists, participating in direct aid programs (Petersen & Verkhratsky, 2022). Existing research provides compelling evidence of the positive effects of international scientific mobility on aspects of scientific career, including international networks of scholars, scientific productivity, professional situation, scientific impact, skills development, scientific knowledge, access to research infrastructure, and funding opportunities (Netz et al., 2020). However, only 58% of emigrant scientists became affiliated with an overseas academic host institution, and a mere 14% of migrant scientists have secured long-term contracts since relocation (De Rassenfosse et al., 2023).

Concomitantly, the vast majority of Ukrainian scientists see value in their experience abroad for future professional development. Researchers expressed their future visions focusing on different perspectives: employment opportunities (position at home university, position abroad or combined, different types of positions, including PhD or postdoc), etc.; task-oriented goals (doing research, working on publications, teaching, working on the double degree programs, diploma recognition, etc.); and professional and personal development (e.g. developing language skills, project management skills, learning new skills or changing qualifications, etc.) (Maryl et al., 2022).

Based on the literature review conducted, the impact of war on scientists is predominantly negative, influenced by financial, psychosocial, and professional risks. Nevertheless, the pursuit of self-realisation and career preservation remains a significant factor supporting career aspirations.

In light of the analysed studies, to assess the plans and perspectives of scientific activity among Ukrainian scientists under war conditions, we formulated and tested the following hypotheses:

H1: Despite their place of residence and military actions, scientists persist in their professional activities.

H2: The perception of future prospects in scientific and educational fields depends on the duration of the war: if the war persists beyond the upcoming year, respondents are willing to consider changing their field of occupation.

H3: Scientists hold optimistic expectations regarding the demand for their intellectual capital abroad: majority are confident they will find opportunities to continue scientific and educational activities in countries where they temporarily reside.

2. Materials and methods

The dataset for this research was compiled using a sociological survey conducted from February18th to March 15th, 2023. It encompassed both teaching staff and students actively involved in research, including Ph.D. students and Master's students completing their theses. Specifically, the survey included students enrolled in Research Master's degree programs, as they represent potential future members of the scientific community.

The one-month survey was conducted using a Google Form questionnaire. Responses were solicited using a 10-point scale or predefined answer options, which were determined and refined during a pilot survey conducted in January 2023.

To gather a sufficient volume of responses, the authors engaged their personal contacts, including professional social networks and groups, as well as contacts from non-governmental organizations (NGOs) involved in supporting Ukrainian migrants abroad, such as NGO Building 4Humanity (Coimbra, Portugal) and NGO Centre for Sociological Research (Szczecin, Poland).

Our survey involved 389 participants totally with such distribution by occupational characteristics compared with the total population of the target groups (Table 1).

Table 1. The distribution of the survey participants compared to the total population of target groups

Target group	Total population*, individuals	Respondents from the group		
		individuals	% of the target group	% of the respondents
university scientific and pedagogical staff	110 994	329	0.30	84.58
researchers *(including* university researchers– 581; non-university researchers – 78 860)	79441	19	0.02	4.88
Ph.D. students	26 389	17	0.06	4.37
Research Master's students enrolled in research-oriented Master's degree programs	10 800	24	0.22	6.17
Totally	227 624	389	0.17	100.00

* According to data of the State Statistical Service of Ukraine.

Our sample size is representative: with a 95 % probability level and 4.96 % error which is appropriate for demographic surveys. Thus, we can use the results achieved for further analysis.

The detailed structure of the sample size is given in Table 2.

Table 2. The distribution of the survey participants

Group of respondents	Share in sample, %
by professional status:	
Master's students	6,2
Ph.D. students	4,4
lecturers	9,8
lecturers with a Ph.D. dissertation	49,1
lecturers with a doctoral dissertation (*specific scientific level typical for Ukraine*)	25,7
researchers	4,9
by gender:	
females	71,0
males	29,0
by age, years:	
under 25	8,0
26-35	14,9
26-40	21,1
41-50	32,1
51-60	17,0
over 61	6,9

Source: *own research.*

The largest sub-group within our target population comprises university scientific and pedagogical staff, accounting for nearly half of all participants.

The survey showed a predominance of females among respondents. The lower participation of male respondents can be attributed to specific restrictions on male migration during the war. Official regulations impose stringent limits on border crossings for men aged 18-60, permitting exceptions only under circumstances such as having three or more children in the family or caring for disabled family members. Given these restrictions and the survey's focus on exploring migration aspirations, male participation was lower due to perceived limited opportunities for migration and corresponding responses.

The age distribution of the sample is relatively balanced, with all age groups adequately represented.

Regarding the ***institutions and regional distribution***, participants were drawn from 75 higher education institutions and research institutes, including those affiliated with the National Academy of Sciences of Ukraine. As a result, our survey encompassed diverse regions of Ukraine and included representatives from various academic disciplines.

Data analysis was conducted using Excel and IBM SPSS Statistics software. A significance level of $\alpha=0.05$ was adopted for the study. Two non-parametric tests were employed to test hypotheses: the Pearson chi-square test of independence for examining relationships between qualitative variables, and the Kruskal-Wallis test for assessing relationships between quantitative and qualitative variables with more than two categories.

3. Conducting research and results

As part of the verification of H1, we found that the professional motivation of researchers is very high, manifested in their professional drive to continue their activities despite limitations imposed by the war (Figure 2).

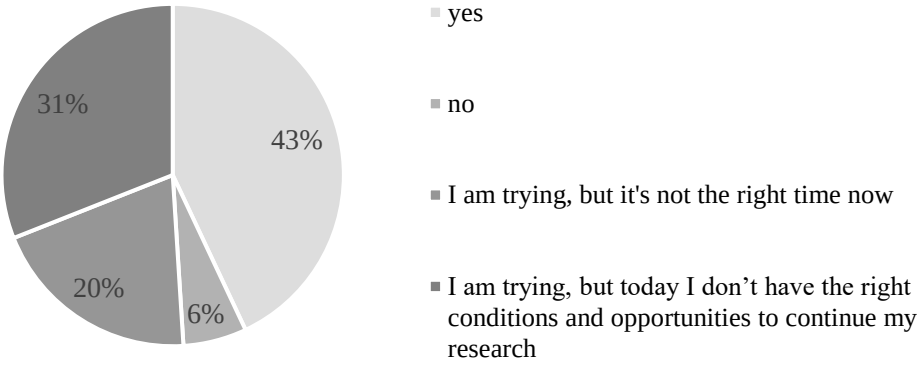

Figure 2. Continuation of research after February 24, 2022.

Among the total number of respondents, 43% of Ukrainian-based scientists, teachers, students, and researchers indicated that the military actions had no impact on their scientific and research activities. Nearly a third of respondents (31%) stated that they are attempting to maintain their research activities at pre-war levels but consider such pursuits currently less timely. Meanwhile, 20% of respondents do not currently have sufficient conditions and opportunities to continue their scientific research. Only 6% of respondents mentioned that they have completely ceased conducting scientific research since February 24, 2022.

In order to elucidate career aspirations, the survey respondents were grouped considering their places of residence at the time of the survey (Figure 3).

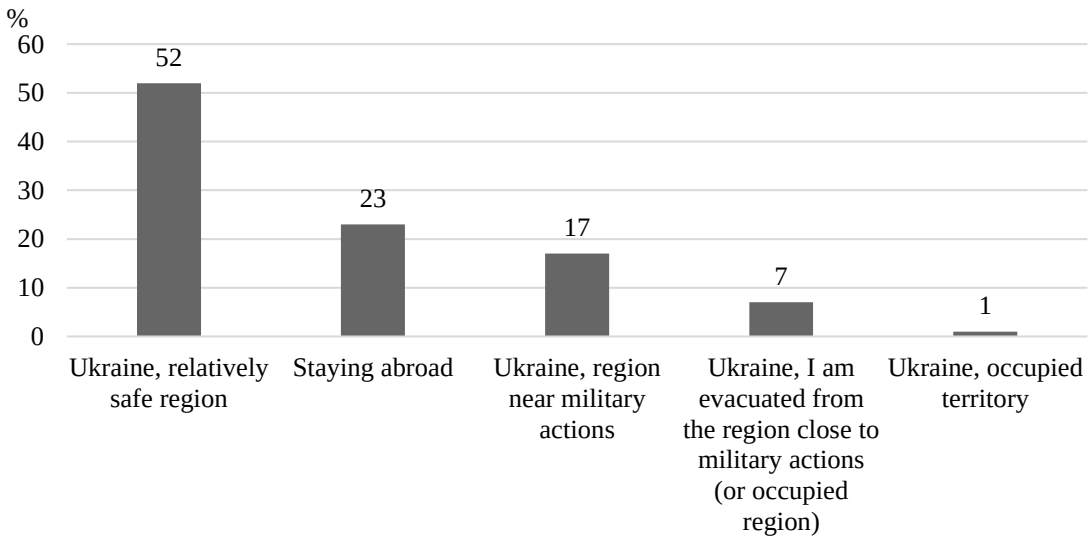

Figure 3. The current residence of respondents

The majority of those surveyed currently reside in relatively safe regions. However, 48% of respondents are living in high-risk areas (or have experienced extreme risks to their lives). Specifically, 7% have undergone evacuation from dangerous territories, 17% are still residing

close to areas affected by war, and 1% of respondents are living under occupation at the time of the survey.

Pearson's chi-square test of independence was employed to assess this dependency. The analyses conducted indicate a significant relationship between the respondents' residential area and their continuation of research activities ($p < \alpha$, $p = 0.0443$). The contingency coefficient was calculated at 0.32, underscoring the significance of this relationship. The detailed distribution of respondents according to their place of residence and plans to continue professional activities is shown in Figure 4.

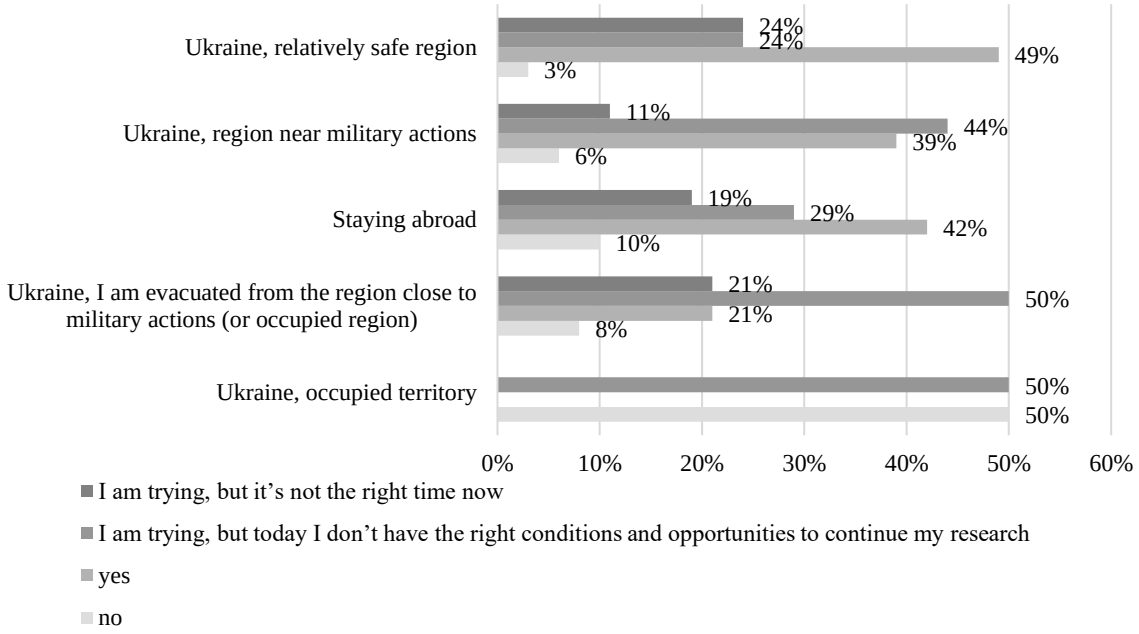

Figure 4. Current residence vs If you were engaged in research until February 24, 2022, do you continue this work now?

Most often, individuals from Ukraine who come from relatively safe regions continue to work in science (49%), as do those who moved abroad (42%). In contrast, people from occupied territories do not work in science (0%). Thus, Ukrainian scientists continue their scientific work regardless of their current residence. ***Therefore, H1 is confirmed***. Scientists who remain in occupied territories constitute 1% of the respondents, a proportion that does not allow for generalisation of the results to all scientists in occupied areas due to understandable obstacles to the distribution of survey questionnaires. However, even within this group, 50% of the respondents attempt to continue their scientific activities. Most scientists either maintain their professional activities or make efforts to do so despite the lack of satisfactory conditions, which also indicates a preservation of career aspirations. As illustrated in Figure 4 (green and yellow shading), the proportion of these two groups is cumulatively larger than that of other surveyed groups, with the highest proportion among respondents located in regions close to military actions.

The premise of H2 is the assumption that the war might exert such a significant impact on respondents that limited access to research infrastructure and educational and work facilities, due to various factors (such as funding, direct destruction, etc.), would compel them to seek alternative means of income. However, the survey results indicate a strong desire among Ukrainian-based scientists, teachers, students, and researchers to continue their educational and scientific activities, even if the war does not end in the near future – 75% of respondents affirmed this intention (Figure 5).

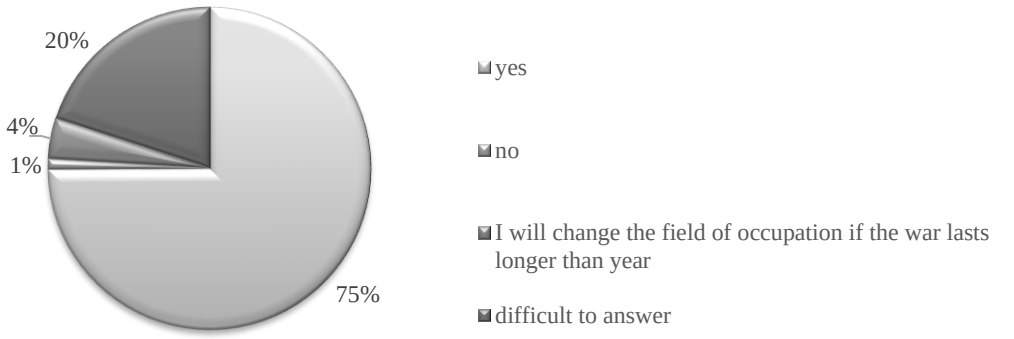

Figure 5. Plans to continue educational activities if the war does not end soon

Only 1% of respondents do not plan to continue their professional activities, while 4% would change their field of work in the event of a prolonged war. One in five respondents (20%) is undecided on the question.

In Figure 6, it is evident that the majority of respondents across all categories, divided by current residence, plan to continue their educational activities if the war does not end soon. The lowest percentage is found among respondents living in occupied territories. In contrast, the highest percentage is among respondents who live in Ukraine and have been evacuated from regions close to military actions (93%), as well as among those residing in relatively safe regions (78%).

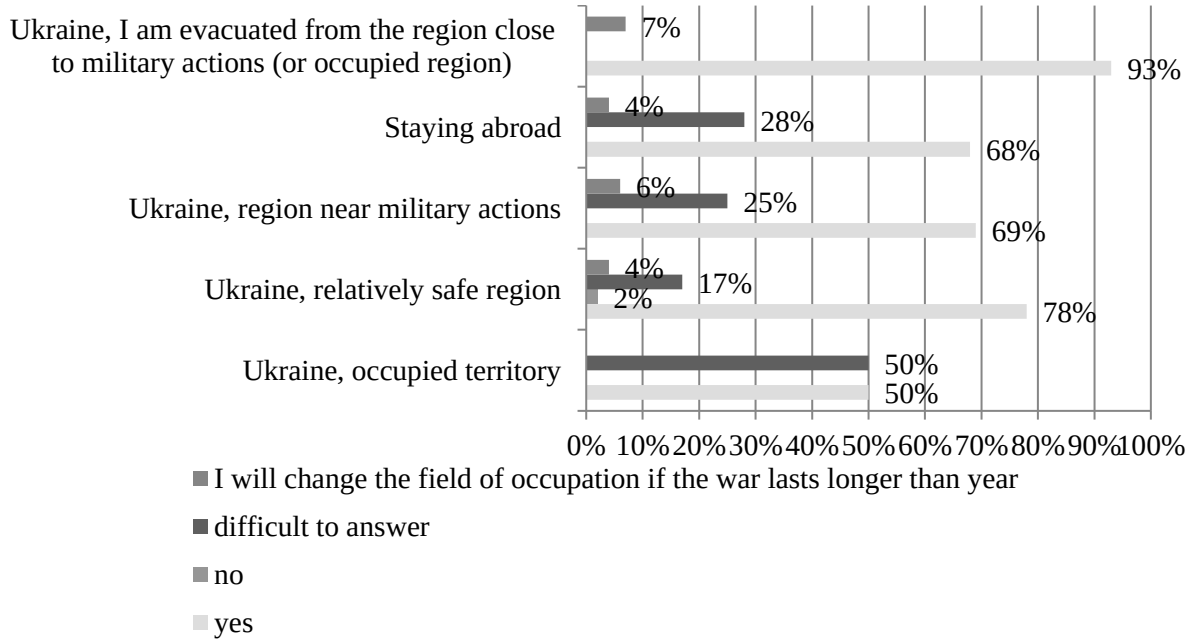

Figure 6. Current residence vs Do you plan to continue educational activities if the war does not end soon? (in %)

For further research, the surveyed respondents were divided into two categories: those who wish to continue conducting research even if the war does not end soon, and others (including those who do not wish to, those with no opinion, and those who plan to change their field of occupation).

Differences between these groups were examined based on current position at the university, gender, age, and current residence. The results are presented in Table 3.

Table 3. Pearson's chi-square test of independence. Current position, gender, age and current residence vs. Plans to continue professional activity if the war does not end soon

	p-value
Current position at the University	0.0700
Gender	0.7205
Age	0.0245
Current residence	0.6244

Table 3 shows that the current position at the university, gender, and current residence are not related to the respondents' plans. Only age is significantly related to research plans ($p < \alpha$, $p = 0.0245$). Figure 7 demonstrates that older respondents are more likely to plan to continue educational activities if the war does not end soon. Demographic characteristics, particularly age-related factors, significantly influence residential and professional mobility decisions, with research demonstrating that older populations exhibit distinct preferences and challenges in adaptation to changing life circumstances (Rącka & Jancz, 2024).

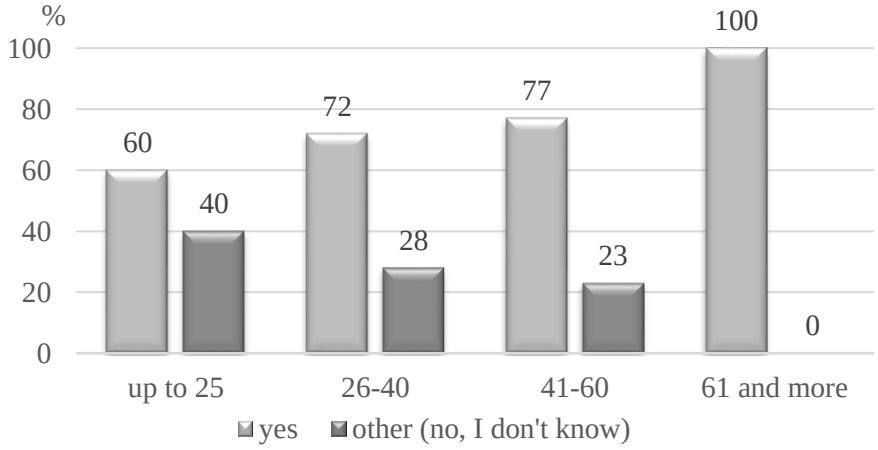

Figure 7. Age vs. Plans to continue educational activities if the war does not end soon

On this basis, the profiles of respondents willing and unwilling to continue their research were also defined. The profiles of these two groups of respondents are very similar, with no significant statistical differences observed.

Respondents who plan to continue educational activities if the war does not end soon are primarily:

- ✓ Lecturers with a Ph.D dissertation (46%) and researchers (6%),
- ✓ Female (77%),
- ✓ Aged between 41-60 (51%), and over 61 (7%).

Respondents who don't plan to continue educational activities if the war does not end soon are primarily:

- ✓ Lecturers with a PhD dissertation (48%),
- ✓ Female (75%),
- ✓ Aged between 41-60 (44%).

Thus, considering the results, our research demonstrates some peculiarities in the motivation to continue professional activities related to demographic features. However, the majority of respondents intend to continue their work. ***Therefore, H2 is not confirmed***.

While examining H3, it was found that pessimistic attitudes regarding the prospects of finding new or additional opportunities to participate in the educational or research process at a foreign institution prevail among the respondents (Figure 8).

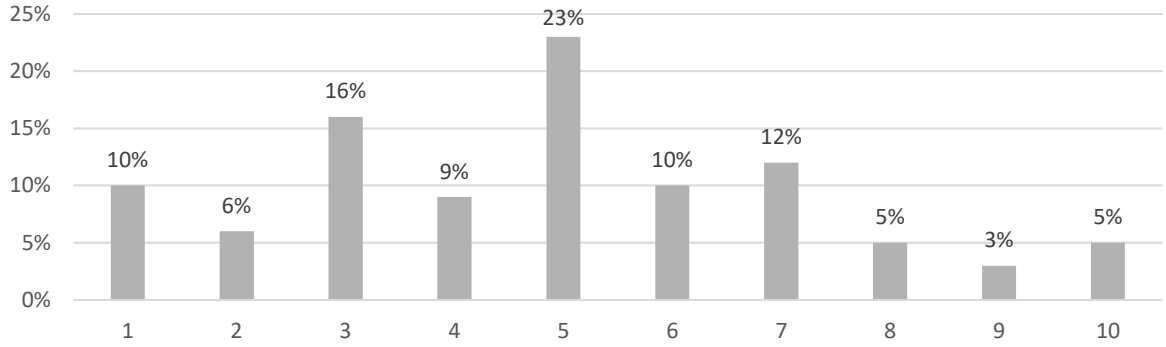

Figure 8. Assessing the chances of finding new or additional opportunities to participate in the educational or research process at a foreign institution during the current period (from 1 to 10 points)

The mean score for odds assessment was 4.9 points, with scores ranging from 1 to 10. The most frequent rating given by respondents was 5 points, accounting for 23% of the respondents. The coefficient of variation is nearly 50%, indicating non-uniform distribution of the scores. Skewness suggests a slight right-sided asymmetry, indicating that a majority of respondents assessed their chances below the mean (4.9). Kurtosis indicates a significant concentration of assessments around the mean value.

The rating of chances to find new or additional employment abroad compared with the distribution of respondents by their plans if the war does not end soon is presented in Figure 9. The Kruskal Wallis ANOVA test was employed for analysis, revealing a significant relationship between the perceived chances of finding new or additional opportunities to participate in educational or research activities at foreign institutions during the current period of life and the intention to continue educational activities if the war does not end soon $p<\alpha$ ($p=0.0406$).

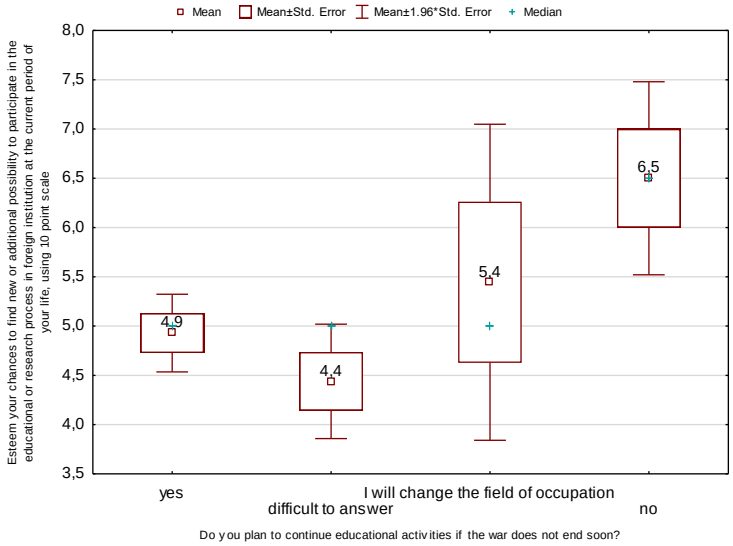

Figure 9. Rating of chances to find new or additional opportunities to participate in the educational or research process in foreign institutions during the current period of life vs. Plans to continue educational activities if the war does not end soon

In the next step, we examined whether there are dependencies between the assessment of opportunities and plans based on current residency.

The test revealed differences in only one case: individuals residing in Ukraine, particularly in safe regions $p<\alpha$ ($p=0.0277$). In other cases, no significant differences were found ($p>\alpha$) (Table 4).

Table 4. Results of the Kruskal-Wallis test. Chances to find new or additional opportunities to participate in the educational or research process at a foreign institution during the current period of life vs Plans to continue educational activities if the war does not end soon in selected categories

Category	p-value
Ukraine, relatively safe region	0.0277
Ukraine, region near military actions	0.2784
Staying abroad	0.1890
Ukraine, I am evacuated from the region close to military actions (or occupied region)	0.4392
Ukraine, occupied territory	0.1573

Our research results indicate that Ukrainian scientists hold pessimistic expectations regarding the demand for their intellectual capital abroad. ***Therefore, H3 is not confirmed***.

Conclusion

Our study, by uncovering the challenges and critical expectations of career prospects, enables the use of the knowledge base obtained to assess the dynamics of migration aspirations and expectations. It also helps to shape new approaches to studying behavioural orientations of highly qualified professionals under the conditions of life and career risks. Such findings are crucial both in the scientific and applied aspects of contemporary behavioural economics, as they develop methodological foundations for investigating behavioural patterns and changes in career aspirations under risk conditions.

The approach we propose for sociological surveys and statistical analysis of assessments can be applied to research changes in behavioural orientations under the influence of various risks, not limited to military ones. When planning the study, we assumed that scientists, as representatives of one of society's elite groups, would have high confidence in their professional prospects. Their primary needs under the conditions of extreme risks, as we expected, were anticipated to differ somewhat from those of average individuals. Security, a fundamental need for any individual, was expected to be equally important for scientists, alongside the need to preserve their career prospects and readiness to seek new ways to continue their activities even amidst war conditions. However, as evidenced by the results of our analysis, hypotheses regarding career aspirations and potential migration intentions associated with them were only partially confirmed.

Indeed, the professional activities of scientists continued regardless of their location during the first year of the war. Challenges and constraints, including infrastructure destruction and forced or voluntary relocation, did not compel the vast majority of respondents to abandon their professional activity. In this regard, critical changes in the financial status of scientists and their ability to continue ongoing projects, documented in thematic studies on the state of science in Ukraine during wartime (Lutsenko et al., 2023b; Harashchenko et al., 2022), did not significantly affect motivation and professional choices during the initial year of the war when expectations for its swift conclusion were relatively high in Ukrainian society. Nevertheless, the significance of professional motivations for academic and research staff is indeed very high,

as evidenced by their readiness to continue professional activities, as found in the verification of Hypothesis 2. Despite occasional lack of basic amenities, constant stress from attacks, destruction, and human losses, which impose significant pressure on scientists, as confirmed in studies closely related to ours (Fiialka, 2022; Lutsenko et al., 2023a), these conditions do not deter their career aspirations. In this regard, our results somewhat differ from the conclusions of Suchikova et al. (2023), where a link between professional activity and place of residence was identified. We attribute these discrepancies to the sample size and composition. Suchikova et al. (2023) considered only lecturers from one university and their research intentions, whereas we evaluated various groups of academic and research staff across Ukraine, along with intentions to continue their entire professional activities, not just scientific ones. Therefore, we consider our findings well-grounded and important for understanding the full spectrum of career aspirations in times of war and similar large-scale threats.

In testing hypothesis 3, we found pessimistic expectations regarding migration opportunities while maintaining professional specialisation. Assessments of prospects for successful professional integration abroad, including at least additional income, were highly critical, with scores not even reaching 5 out of 10. These findings somewhat contradict the positive expectations regarding prospects abroad identified by Maryl et al. (2022), which can be explained by the different research objectives: Maryl et al. (2022) identified migration aspirations combined with retaining positions in the country of permanent residence. In our study, we observed that when the primary alternative is the possibility of finding a job abroad according to one's profession, assessments become very pessimistic. Naturally, this necessitates migrants to adjust their personal behavioural strategies. Within the Ukrainian scientific community, this reinforces the relevance of seeking ways to integrate into the international academic sphere through participation and interaction rather than passive support.

Therefore, among the main results illustrating behavioural characteristics and adaptation to risks among members of the academic community, the following are particularly significant. The subjective assessment of the value of a professional career is very high (as are pessimistic assessments of employment prospects abroad), prompting many professionals to remain in Ukraine despite life-threatening risks, as even nominally safe territories are not entirely secure today. In assessing migration prospects and career planning abroad, professional ambitions yield to the need for finding a new way of life. However, if migration intentions with such informed prospects are realised, social and economic losses are expected – both personal and societal for donor countries due to brain drain, uncompensated investments in education in the country of origin (Khan, 2021; Neiva Ganga et al., 2018; Oliinyk et al., 2022; Radu et al., 2023), loss of productivity, and economic growth, which today largely depend on intellectual labour and efforts to retain talent (Biglari et al., 2022; Bilan et al., 2024).

Therefore, we believe that seeking paths for real integration of Ukrainian scientists into the global academic community is important not only due to risks for Ukrainian academic and research staff but also because the war has provided a powerful impetus to reconsider prospects, demonstrating support for Ukrainians in many countries and fields of activity. Proactive policy measures for managing large-scale population movements demonstrate increasing importance in contemporary international relations, as strategic economic interventions can effectively facilitate orderly migration patterns while maintaining socioeconomic stability during crisis periods (Lough, 2024). However, such support, like any temporary aid, should stimulate scientists to intensify their search for long-term foundations of professional success without losses for the country where their professional development occurred. The development of joint scientific and educational programs and projects, real international cooperation culminating in joint employment in projects – not just experience sharing – should, in our opinion, become a priority in supporting the recognition of Ukrainian lecturers and researchers.

The discussion of these directions with an assessment of primary efforts toward integration of Ukrainian scientists into the global professional community is considered perspectives for further research. We plan to conduct this research based on expert surveys of Ukrainian and foreign scientists familiar with the problems of adaptation and professional development of Ukrainian intellectual migrants.

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