

# War-induced relocation of high-tech companies: Spatial perspectives from Ukraine and Poland

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## ABSTRACT

**Objective:** The article aims to assess the scale and direction of the relocation of Ukrainian high-tech companies following the Russian invasion in February 2022, with a particular emphasis on comparing the relocation processes within Ukraine and those from Ukraine to Poland. The article seeks to identify the strategies, challenges, and outcomes associated with these relocations, offering insights into the broader implications of such movements for both the Ukrainian and Polish economies.

**Research Design & Methods:** This study employs a mixed-methods design, incorporating both quantitative and qualitative approaches. It analyses available data from official Ukrainian and Polish statistics and includes interviews with representatives from regional military administration offices in Ukraine, municipal offices in Poland, support institutions, and relocated IT companies. Descriptive statistics and thematic analysis are used to assess the relocation processes, challenges, and outcomes.

**Findings:** The study shows that the Russian invasion of Ukraine led to significant relocation of high-tech companies, representing IT sector. Western Ukrainian regions like Lviv and Zakarpattia became key hubs with 78% of relocated companies resuming operations. In Poland, Ukrainian high-tech firms constitute 7.1% of all high-tech companies, with Warsaw, Krakow, and Wroclaw as top destinations, however the concentration measures are the highest in regions neighbouring Ukraine. The relocation faced distinct challenges in both countries, including infrastructure in Ukraine and legal issues in Poland, underscoring the adaptability of Ukrainian businesses and various relocation strategies.

**Implications & Recommendations:** The study highlights the resilience of high-tech companies relocating within Ukraine and to Poland. The presence of Ukrainian firms in Poland suggests opportunities for deeper economic integration, encouraging targeted policies to support innovation and collaboration.

**Contribution & Value Added:** This article offers a novel analysis of the relocation of high-tech companies from Ukraine during the war, focusing on comparative experiences in Ukraine and Poland. It fills a gap in the literature by providing insights into the strategies and challenges faced by these companies in wartime and the support of state and regional institutions and administration.

**Article type:** research article

**Keywords:** relocation of enterprises; war in Ukraine; high-tech enterprises; IT enterprises; relocation strategies

**JEL codes:** F22, L26, M15

Received: 2 September 2024

Revised: 27 November 2024

Accepted: 21 January 2025

## Suggested citation:

Olechnicka, A., & Kniazevych, A. (2025). War-induced relocation of high-tech companies: Spatial perspectives from Ukraine and Poland. *International Entrepreneurship Review*, 11(2), 83-103. <https://doi.org/10.15678/IER.2025.1102.05>

## INTRODUCTION

The relocation of Ukrainian businesses forced by Russia's aggression needs to be considered within a broad geopolitical context. Ukraine is the second-largest country in Europe, situated to the east of the EU countries. Its area constitutes 5.4% of the total area of Europe, and its population – 5.5%. The modern Russian-Ukrainian war began in April 2014, when 7% of Ukrainian territory, including

parts of the Donetsk and Luhansk regions and Crimea, was temporarily occupied. In February 2022, the full-scale Russian invasion of Ukraine began. The war in Ukraine has brought about a series of significant consequences for business operations.

Primarily, these consequences relate to restricted access to territories. As of July 2023, a total of 18% of Ukraine's territory is occupied, including the Autonomous Republic of Crimea, as well as parts of the Luhansk, Donetsk, Kharkiv, Zaporizhzhia, and Kherson regions (DeepStateMap, 2023).

Secondly, the war has caused enormous damage, amounting to more than USD 143.8 billion (at replacement cost). Residential buildings (37.3% or USD 53.6 billion) and infrastructure (25.2% or USD 36.2 billion) accounted for the largest share of total direct damages. Business asset damages amount to at least USD 11.3 billion and continues to grow. Many industrial and civil infrastructure facilities have been mined and destroyed. War damage has affected a significant proportion of industrial resources. The most affected or destroyed industrial facilities include Ilyich Iron and Steel Works and Azovstal (Mariupol), Motor Sich (Zaporizhzhia), Zorya-Mashproekt (Mykolaiv), Ukrainian Energy Machines (Kharkiv), Avdiivka Coke Plant (Avdiivka) in the chemical industry, Philip Morris Ukraine (Kharkiv) in cigarette production, and Antonov (Kyiv, Hostomel) in aircraft manufacturing.

Thirdly, the war exacerbates Ukraine's existing demographic problems. Ukraine's population decreased by more than 9% in the ten years preceding it. Due to the full-scale invasion, more than 9 million Ukrainians, predominantly women with children and the elderly, left the country (United Nations, 2023). Poland has become a leader in accepting Ukrainian refugees. In March 2022, official statistics recorded 3.2 million Ukrainians in Poland, including pre-war residents and migrants (UMP, 2022). Approximately 900 thousand Ukrainians found refuge in Germany, 391 thousand in the Czech Republic, and around 150 thousand in Turkey and Italy. Moreover, Moldova, Romania, and Slovakia took 80 thousand refugees (EBRD, 2022).

Destruction, occupation of territories, and migration have caused fundamental changes in the country's economy. Massive bombing attacks posed a real threat to the civilian population, and the destruction of energy infrastructure caused significant problems in the electricity supply, leading to total blackouts. Companies have faced the need to relocate assets and staff to ensure security and business continuity. The full-scale war has also prompted the relocation of businesses from temporarily occupied territories, areas of active fighting, and regions under the threat of shelling to relatively more secure locations. The nature of such a move and the approaches to its implementation varied. The relocation received support from the Ukrainian government and other host countries, and depended primarily on the financial capacity of entrepreneurs, the willingness to relocate, and a complex of subjective factors – all of which have been carefully examined and analysed in this study.

The article focuses on the relocation processes of the Ukrainian high-tech sector, which is traditionally dominated by IT companies – in 2021, they accounted for 40% of high-tech firms (State Statistics Service of Ukraine, 2022). The IT sector was a strong element of the Ukrainian economy and became crucial during wartime. The IT enterprises are vital contributors to the nation's economic landscape. In 2021, the IT sector provided gainful employment to 285 thousand skilled professionals, accounting for 4% of Ukraine's Gross Domestic Product (GDP) and 35% of service exports. This burgeoning industry thrives within five key IT clusters in Kyiv, Kharkiv, Lviv, Odesa, and Dnipro, each characterised by well-established institutional support and robust infrastructure (IT Ukraine Association, 2021). During the war, the sector transformed into a strong volunteer front, standing at the forefront of designing, developing, and applying military technologies, and establishing reliable and effective actions in cyberspace (Mukhina, 2023).

The dynamics of the IT ecosystem were driven by endogenous factors (such as IT infrastructure, regulation, and managerial standards) and exogenous factors, including the compulsory migration of businesses from the occupied Autonomous Republic of Crimea, and the Donetsk, and Luhansk regions in 2014. With the escalation of the war in February 2022, numerous high-tech companies opted to relocate their operations within Ukrainian borders, while others took preventive measures to move their activities abroad.

There is a scarcity of research on business relocation in response to conditions of uncertainty and security threats. We can distinguish subsets of studies focusing on relocation in different contexts, such

as 1) shifting geopolitical circumstances exemplified by events such as Brexit (Bilbao-Ubillos & Camino-Beldarrain, 2021; Oxley, 2020; Sohns & Wójcik, 2020) or Catalonia's referendum (Méndez-Suárez, 2021); 2) challenging or precarious economic environments, as exemplified by episodes like the economic crisis in Greece (Kapitsinis, 2018; 2019); 3) natural disasters (Linnenluecke *et al.*, 2011) and 4) wartime scenarios and military actions. The latter category encompasses both historical investigations, elucidating relocation experiences during the Cold War era, for instance, as well as a notably smaller body of research dedicated to contemporary instances of relocation associated with ongoing wars in regions such as Syria (Salmon *et al.*, 2018) or Ukraine (Korovkin *et al.*, 2018). The relocation of Ukrainian high-tech businesses since 2014 remains a largely unexplored topic. According to news sources, small businesses from Sevastopol, Donetsk, and Luhansk have relocated to Odesa, Kyiv, and other cities and countries. While some research has shed light on the emigration of IT specialists, providing insight into the situation of the high-tech sector, the primary reason for this group's departure after 2014 was the sense of threat. According to data from March 2022, most IT industry specialists have relocated to the Lviv and Ivano-Frankivsk regions, as well as Poland and Germany (Ippolitova, 2022).

The article addresses the limited research on business relocation under conditions of uncertainty and security threats, focusing on the Ukrainian high-tech sector. It examines the scale and directions of business relocation resulting from Russia's aggression in February 2022, as well as the mechanisms, strategies, and challenges involved. The article is divided into four sections. The first reviews literature on business relocation during wartime, highlighting the lack of studies on corporate relocation in contemporary wars, particularly in high-tech sectors. The second section outlines the data and methods used to analyse internal relocations and cross-border movements, particularly to Poland. The third section presents findings, including an analysis of relocation patterns, strategies employed by firms of different sizes, and comparisons between Ukraine and Poland. The final section summarises the research findings and identifies areas for further study, addressing gaps in understanding high-tech relocation during wars.

## LITERATURE REVIEW

A literature review indicates a scarcity of research on corporate relocation in response to security threats, revealing four identifiable categories of situations analysed: geopolitical change, economic uncertainty, natural disasters, and wartime, which de facto aggregates the aforementioned threat situations.

The first category of research analyses the impact of geopolitical change on business relocation. Studies by Sohns and Wojcik (2020) and Bilbao-Ubillos and Camino-Beldarrain (2021) examine how the UK's decision to leave the European Union affected the fintech and high-tech industries, respectively, while Méndez-Suárez (2021) analyses the conditions under which companies decided to relocate following the Catalan referendum. The authors indicate that the choice of relocation destination depends on several company characteristics, including their position within the network of business connections and the sector represented. For example, financial companies chose to relocate to highly developed countries such as France, Germany, and Ireland to maintain access to the European market, while companies representing other sectors opted for less developed markets where they could secure more favourable business conditions.

In the second category, research focuses on company relocations triggered by the economic crisis. Kapitsinis (2018; 2019) conducted a comparative analysis of the relocation patterns of Greek small and medium-sized enterprises (SMEs) to Bulgaria before and after the economic crisis. The results highlight the strong correlation between business mobility and factors internal to the firm, such as size, sector, and entrepreneurial strategy. Kapitsinis (2018; 2019) indicates that the relocation was driven by a stronger reaction to the crisis of the Greek economy and by the frequent relocation of companies seeking survival rather than growth opportunities.

The third category of studies examines the impact of climate change on relocation. As research by Linnenluecke *et al.* (2011) indicates, climate change events such as droughts, floods, or sea level rise can lead to disruptions in a company's supply chains, customer base, or resource pool. Understanding

the implications of climate-related disruptions is of paramount importance for both companies and decision-makers in developing strategies to mitigate these risks and ensure business continuity.

The fourth and main part of this particular category of research consists of articles relating to relocations caused by military action and war threats. This group includes both historical articles, such as those on relocation during the Cold War, and much rarer studies on contemporary wars in Syria or Ukraine. The literature on corporate relocation during war highlights a complex and multifaceted process, as pointed out by Mulska *et al.* (2023). They emphasise that the relocation of companies during war occurs under difficult and dangerous conditions of deteriorating security, economic crisis, and humanitarian catastrophe. The process involves various forms of relocation, including full or partial, internal or external relocation, each with unique challenges and considerations. Legal and organisational issues take centre stage in this discourse, often focusing on emergency measures to relocate operators' production facilities from regions affected by ongoing military operations to safer areas (Korobka, 2023). As Vashkiv (2022) explains, the primary reasons for such relocations are the imperatives of maintaining business operations, ensuring the safety of employees, and protecting valuable assets.

The external relocation, particularly to areas characterised by stable political conditions, is a recurring theme in the literature, as noted by Salmon *et al.* (2018). For example, companies forced to cease operations in Syria due to the war have typically relocated to neighbouring countries in safe zones with stable economic conditions, such as Lebanon, Turkey, and Jordan, as well as to Gulf countries, such as the United Arab Emirates and Qatar. This strategic choice is motivated by the desire to create a secure environment conducive to business continuity. However, external relocation of the IT sector, especially to countries such as Poland, is a cause for concern in the context of Ukraine. Several sources, including Mulska *et al.* (2023) and Vasylytsiv *et al.* (2022) and The Economist (2022), highlight the perception of this trend as a potential threat to Ukraine's economy, finances, and innovation ecosystem.

Moreover, the literature analyses the various challenges accompanying relocation processes in Ukraine. These challenges include economic disruption due to the termination of internal and inter-regional economic ties, organisational obstacles due to the lack of suitable business locations, difficulties in establishing engineering networks, and inadequate social infrastructure for relocated workers. Demographic challenges arise from the shortage of qualified specialists for the disassembly and assembly of complex equipment and the loss of workforce potential due to migration. In addition, logistical challenges come to the fore, including blocking and disrupting supply chains and sales logistics, as well as the complex and lengthy transportation of equipment to relocation sites.

To shed light on practical strategies, the literature utilises case studies, exemplified by Polunina (2022), offering valuable insights into how companies navigate the complex terrain of relocation during armed conflict. Together, these findings highlight the nuanced and multifaceted nature of corporate relocation in wartime, with implications for legal, organisational, economic, demographic, and logistical issues, as well as the critical importance of strategic planning and case-based insights in this challenging context.

Building on the insights from the literature, the article focuses on the largely unexplored topic of high-tech business relocation during wartime, with particular emphasis on Ukraine following the Russian invasion in February 2022. It aims to assess the scale and direction of these relocations, highlighting both internal movements within Ukraine and cross-border relocations to Poland, while exploring the strategies, challenges, and outcomes associated with these processes. The study tests two hypotheses: (1) that security, legal, administrative, and institutional conditions collectively influence the strategies and challenges encountered by high-tech companies in the process of relocation; and (2) that the spatial dimension of relocation is shaped by the combined effects of security imperatives, the feasibility of remote work, proximity to technological ecosystems, and geographic proximity to Ukraine, particularly in the context of relocation to Poland.

By addressing these aspects, the article contributes to the understanding of wartime corporate relocation, offering insights into its implications for both the Ukrainian and Polish economies, and for broader theoretical perspectives on relocation under extreme uncertainty.

## RESEARCH METHODOLOGY

Assessing the scale of Ukrainian business relocation within Ukraine and from Ukraine to Poland presents a challenge. Access to data sources is limited, and the process under study is extremely dynamic. For this reason, we used a multifaceted approach combining desk research and various data sources to comprehensively investigate the phenomenon of corporate relocation. We conducted the study using a comparative approach, analysing the situation of relocated enterprises both within Ukraine and from Ukraine to Poland. The temporal scope of the study covers mainly the period of February 2022 to December 2022. However, some of the information obtained is more recent. Firstly, we conducted a secondary source analysis, reviewing both academic literature and newspaper articles to gain insight into the broader context of corporate relocation, particularly in situations of insecurity and war. This literature review provided a basis for understanding the key factors and challenges associated with such business relocations during wartime.

The study considered sparse quantitative data on state-supported relocation initiatives and high-tech companies published by the Ministry of Economy of Ukraine and the State Statistical Service of Ukraine. Data from DOU.ua regarding IT specialists and IT companies were also used. We analysed the scale and characteristics of the relocation of companies from Ukraine to Poland based on data from the Central Economic Information Centre (COIG) regarding companies with Ukrainian capital and data from the Central Register and Information on Business Activity (CEDIG) regarding sole proprietorships established by Ukrainians. The data were pre-processed and made available by the Polish Economic Institute (PIE). These datasets enabled us to conduct a detailed examination of the economic activities and movements of Ukrainian entrepreneurs and companies in Poland.

Moreover, between December 2022 and July 2023 the several in-depth interviews were conducted with officials from 13 Regional Military Administration Offices (Kyiv, Lviv, Ternopil, Rivne, Lutsk, Ivano-Frankivsk, Uzhhorod, Khmelnytskyi, Vinnytsia, Zaporizhia, Odesa, Sumy, and Kherson), as well as with five representatives of Municipal Offices responsible for entrepreneurship development in five big Polish cities Warsaw, Krakow, Wroclaw, Katowice, and Poznan. Moreover, five representatives of support institutions in these cities were interviewed, namely the Polish-Ukrainian Chamber of Commerce, Polish Investment and Trade Agency, Poland Business Harbor, Krakow Technology Park, and Dija. Business Warsaw. Furthermore, interviews were conducted with six IT companies, three of which relocated within Ukraine and another three from Ukraine to Poland (see *Appendix* for a list of institutions). These interviews provided qualitative insights and first-hand perspectives on the challenges and opportunities associated with the relocation of businesses with Ukrainian capital. We conducted the interviews in a mixed manner due to the locations and availability of the interlocutors, including face-to-face, online, and written forms.

## RESULTS AND DISCUSSION

### The Scale of Business Relocation Within Ukraine

Analysing business registrations in Ukraine's regions during the full-scale war (March-April 2022), we can clearly see that there have been substantial shifts in the business attractiveness of Ukrainian territories, with 80% of regions changing their positions in the rankings due to the impact of Russia's invasion. It is evident that the positions of the north-eastern and southern regions, where combat operations took place, deteriorated, while western regions exhibited the opposite trend. In the Donetsk and Luhansk regions, where the war has been ongoing for 10 years, their positions remained relatively stable. The most damaging impact of the full-scale war was observed on the business activity in regions such as Sumy (dropped from 14th to 20th place in the ranking), Mykolaiv (dropped from 12th to 21st place), and Kherson (dropped from 11th to 24th place). Right-bank regions, including Ternopil (rose from 20th to 8th place in the ranking), Cherkasy (rose from 18th to 9th place), Ivano-Frankivsk (rose from 16th to 7th place), and Rivne (rose from 22nd to 13th place in the ranking) demonstrated significant improvements their positions (Decentralization, 2022).

According to the interviews, the dynamism of the relocation process makes it difficult to estimate its scale, particularly in obtaining statistical information on the scale of relocation of IT companies.

Moreover, the scope of state-supported relocation efforts within Ukraine is noteworthy, as reported by the Ministry of Economy of Ukraine in March 2023. A total of 800 companies decided to relocate from regions considered hazardous due to ongoing war and instability and received support under the state relocation programme. The primary region for business relocation encompasses nine specifically designated regions in Western Ukraine, namely Khmelnytskyi, Chernivtsi, Ivano-Frankivsk, Lviv, Rivne, Ternopil, Vinnytsia, Volyn, and Zakarpattia, which have been identified by the state as the safest due to their considerable physical distance from the ongoing war zones.

The Lviv region stands out as a major destination, hosting 192 of the relocated businesses, reflecting its attractiveness as a secure business environment. Moreover, the Zakarpattia region has accommodated 116 companies, further emphasizing the importance of regional stability. The resilience and adaptability of these enterprises are evident as they navigate the challenges posed by the ongoing war and prioritize the safety and continuity of their operations. Impressively, 78% of these 800 businesses successfully transitioned to their new locations, resuming their operations with a renewed sense of security. The majority of these companies are large enterprises operating in the wholesale and retail sector (40%) and manufacturing industry (30%) (such as LLC 'Pozhmyshyna,' LLC 'Korum' 'Druzhkivsky Machine-Building Plant,' LLC 'Staleks,' PJSC 'Kramatorsk Heavy Machine Building Plant'). Among the relocated firms, nearly 7% are involved in information and telecommunication (Mulska *et al.*, 2023).

However, some companies opted to safeguard their assets by temporarily suspending their operations. Interestingly, approximately 650 firms reconsidered their relocation plans as a result of positive developments, including the de-occupation of territories such as Kyiv, Kharkiv, and Kherson. This change in circumstances led them to remain in their current locations. Moreover, 44 businesses have decided to return to their original workplaces, benefiting from improved security conditions in areas such as Kharkiv, Chernihiv, and Sumy. These dynamic shifts in relocation patterns reflect the complex and evolving situation within Ukraine, as businesses respond to changing security and economic factors (calculated based on data from the Ministry of Economy of Ukraine, *Appendix*, Institution 1).

There is no direct statistical data on the extent of relocation of high-tech firms. The largest relocated and partially relocated firms include GlobalLogic, EPAM, Sigma Software, Luxoft, and Intellias, among others, which relocated within Ukraine and abroad by creating new offices or using existing branches as a base (DOU.ua).

The most important relocation regions within Ukraine are the Lviv region, which has seen a significant increase in the number of IT companies (41%); the Uzhhorod region, which attracts relocators due to its security and proximity to the border (an increase of 387 IT professionals and 369%); and the Ternopil region, where 4 IT companies and 277 professionals have settled (a 298% increase). However, regions under occupation and close to the front line have experienced significant losses. For example, the Kharkiv region lost 10 IT companies (40%) and more than 10 thousand employees (79%), while the Mykolaiv and the Zaporizhzhia regions lost 802 (83%) and 251 (91%) IT specialists respectively (DOU, 2020; 2021; 2023).

**Table 1. Dynamics of changes in the number of IT companies and specialists in the largest cities of Ukraine, 2020-2023**

City	2020		2021		2023	
	Companies	Specialists	Companies	Specialists	Companies	Specialists
Kyiv	45	25 623	44	31 767	44	21 773
Kharkiv	21	10 057	25	13 700	15	2 837
Lviv	23	10 938	22	13 905	31	15 191
Odesa	15	2 389	17	3 276	15	2 418
Dnipro	13	2 720	15	3 634	15	2 792
Vinnitsa	9	1 500	11	1 462	12	1 644

Source: own study based on data from (DOU, 2020; 2021; 2023).

The war in Ukraine has reshaped the landscape of business activity across its regions, with profound implications for economic development and stability. The relocation of businesses, particularly in the IT sector, underscores the adaptive response of enterprises to ensure operational continuity amidst challenging circumstances. Regions such as Lviv, Uzhhorod, and Ternopil have emerged as new hubs for business, benefiting from their perceived security and strategic locations. Meanwhile, areas directly affected by the war experienced significant setbacks, emphasizing the dynamic nature of economic migration in response to changing geopolitical realities. As Ukraine navigates these complexities, the resilience of its business community remains pivotal in shaping its future trajectory.

### **The Scale of Business Relocation from Ukraine to Poland**

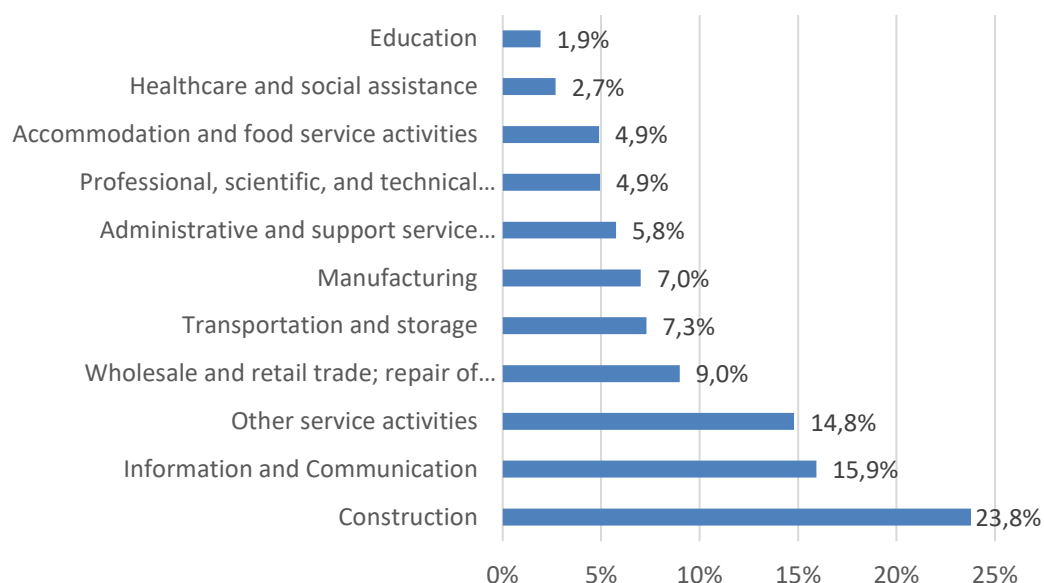
One way to gauge the extent of this phenomenon is through an analysis of the number of enterprises with Ukrainian capital operating in Poland. Based on data from Statistics Poland as of January 2023, it becomes evident that Ukrainian enterprises are playing a significant role in the country's economic landscape. They constitute 25% of all foreign capital enterprises in Poland, surpassing even Germany, which stands at 10%. A substantial 19% of these Ukrainian enterprises were established in the year 2022, underlining their dynamic growth. These entities exhibit diversified sectoral involvement, with a substantial presence in retail (22%), construction (19%), and the transport and warehousing sector (14%). Information and communication activities contribute 7% to their operational profile.

Geographically, Warsaw emerges as the predominant location, housing 33.6% of these enterprises, followed by Krakow at 10%, and Wroclaw at 8%. Furthermore, the number of enterprises established in 2022 recorded a remarkable 9% increase compared to the preceding year, signifying a robust growth trajectory. Intriguingly, the most substantial year-on-year expansion was observed in 2015, with an impressive growth rate of 121%.

The magnitude of the relocation phenomenon from Ukraine to Poland is striking. According to data from the Central Register and Information on Economic Activity as of December 2022, Ukrainians established a significant number of sole proprietorships in Poland in 2022. The figures reveal that a remarkable 15.9% of sole proprietorships of Ukrainian origin were registered within this timeframe. Noteworthy, a staggering 97.6% of these registrations occurred between March and December, demonstrating a substantial and rapid increase, approximately 12 times higher than those registered in February. This influx of Ukrainian entrepreneurs contributed significantly to the overall business landscape in Poland, accounting for 5.7% of all companies established in the country in 2022. These statistics reflect the relocation of Ukrainian businesses to Poland in response to the ongoing war in Ukraine. This development is indicative of the resilience and adaptability of Ukrainian entrepreneurs who have sought opportunities and stability in Poland amidst the challenging circumstances in their home country (Figure 1).

According to the NACE Rev. 2 classification, which categorises businesses based on their research and development (R&D) intensity, 2 534 high-tech Ukrainian firms established themselves in Poland. This influx accounted for 15.9% of all Ukrainian businesses registered in Poland that year. Notably, these Ukrainian high-tech companies constituted 7.1% of all high-tech firms registered in Poland in 2022. It's important to highlight that 5.7% of all companies established in Poland in 2022 had Ukrainian capital, signifying that the share of Ukrainian high-tech companies in Poland exceeded the overall share. This data underscores Poland's growing appeal as a destination for high-tech enterprises and the significant contribution of Ukrainian firms to Poland's technological landscape and innovation.

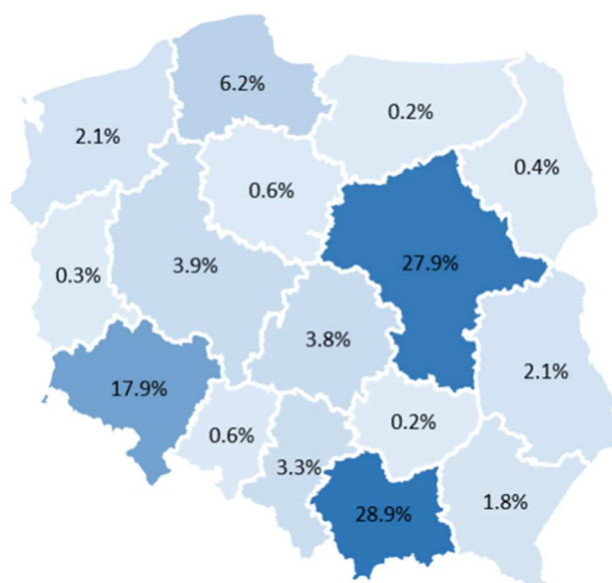
The majority of the 2 543 Ukrainian IT firms that registered in Poland in 2022, comprising 74% of these firms, are primarily involved in software-related activities, specialising in software development, including web and mobile applications, and software solutions. Moreover, around 13% of these firms focus on IT consultancy activities, offering expertise in IT infrastructure, cybersecurity, and technology strategies. The remaining 12% encompass a diverse range of fields, including IT services, hosting, internet portals, video production, and post-production processing (Figure 2).



**Figure 1. Ukrainian firms by sector or business activity, 2022**

Source: The Central Register and Information on Economic Activity, Statistics Poland 2022, [https://www.coig.com.pl/wykaz\\_lista\\_firm-z-ukrainskim-kapitalem\\_w\\_polsce.php](https://www.coig.com.pl/wykaz_lista_firm-z-ukrainskim-kapitalem_w_polsce.php)

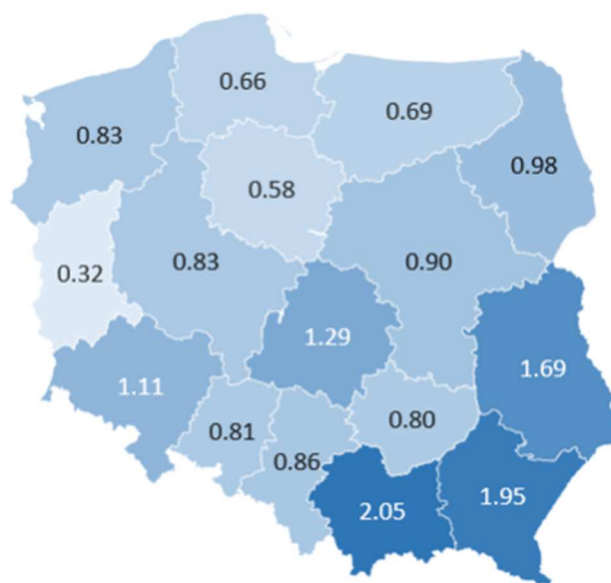
The Location Quotient (LQ) analysis of Ukrainian IT firms' presence in various Polish regions reveals significant disparities (Figure 3). Małopolskie, known for its robust IT ecosystem, exhibits the highest LQ value of 2.05, signifying a substantial concentration of Ukrainian IT companies compared to the national average. Meanwhile, Podkarpackie and Lubelskie, both bordering Ukraine, follow closely with LQ values of 1.95 and 1.69, respectively, highlighting their strategic appeal to Ukrainian IT firms due to their proximity to the Ukrainian border. Łódzkie shows a moderate concentration with an LQ of 1.29, while Mazowieckie, including Warsaw, maintains a presence below the national average with an LQ of 0.90. Most other regions display LQ values below 1, indicating a lower concentration of Ukrainian IT firms compared to the national average. These variations reflect the influence of geographical proximity, business environment, and policies on the location choices of these companies.



**Figure 2. The regional share of high-tech Ukrainian companies registered in Poland in 2022**

Source: own elaboration based on data from the Central Register and Information on Economic Activity provided by the Polish Economic Institute.





**Figure 3. The location quotient of high-tech Ukrainian companies registered in Poland in 2022**

Source: own elaboration based on data from the Central Register and Information on Economic Activity provided by the Polish Economic Institute.

### The Relocation Mechanisms in Ukraine and from Ukraine to Poland

#### Common Features of Relocation Mechanisms in Poland and Ukraine

Drawing from the interviews, we can assert that the relocation processes within Ukraine and from Ukraine to Poland share several features. Firstly, in both countries, the relocation processes were supported by favourable legal conditions. The State Relocation Programme launched on 25 March 2022 in Ukraine (Ministry of Economy of Ukraine, 2022) aims to rebuild the economy by relocating businesses from war-affected or nearby territories to safe backline regions in Western Ukraine. The state programme encompassed several key initiatives, prominently including the seamless registration of business relocations to new locations, facilitating the efficient relocation of workers, and providing businesses with the invaluable prospects of preferential taxation or state loans through the State Programme 'Affordable Loans 5-7-9%' implemented with the support of the President and the Government of Ukraine. The programme simplifies access to bank lending for enterprises, offering the opportunity to receive a loan at a reduced interest rate through state compensation of interest rates to the level of 5%, 7% and 9% per annum for loans in national currency. The compensation interest rate (rate for the client) depends on the purpose of financing, the amount of annual income from business activities, and the number of jobs created.

At the same time, in Poland, the Special Act is in force (Sejm of Poland, 2022), referring to a specific legislative measure aimed at assisting Ukrainian citizens affected by the Russian aggression. This act encompasses various provisions, including facilitating the attainment of legal residence in Poland, the establishment of new business activities, changes in tax residency, and granting access to EU loans and grants. The Special Act, implemented on 12 March 2022, specifically addresses the provision of assistance to Ukrainian citizens affected by the armed conflict. Its objectives include facilitating the acquisition of legal residence in Poland, enabling the establishment of new business activities, facilitating changes in tax residency, and granting access to EU loans and grants.

Moreover, the favourable legal conditions were accompanied by an immediate response from state and regional institutions, government agencies, and public organisations. In Ukraine, the regional military offices play a crucial role. Since March 2022, the provincial offices across Ukraine have been transformed into 25 regional military offices, which are responsible for coordinating with the military command, defence, civil defence, public safety, and order. In the regional military administrations of Ukraine, specialists were appointed within the departments of economics to provide direct support to

relocated enterprises through close collaboration with other departments of the administrations, local communities, and civil organisations. The assistance provided to relocated businesses focused on finding suitable premises, connecting to infrastructure, addressing the transportation of assets, employees, and their families, as well as offering support for psychological and social adaptation in the new location (interviews, companies 1-3, institutions 7-8).

‘We have a fairly open administration; they have worked in business and have known each other for many years. We focus specifically on what is needed, and we provide help where necessary... As regional authorities, we offer assistance and support but do not insist – everything is voluntary... Overall, we have good cooperation with all clusters’ (interview, institution 7).

‘Our strength lies in the fact that, as an investment team, we are positioned at the intersection of business needs, and the interests and needs of the community and the region as a whole’ (interview, institution 8).

While in Poland, the existing bodies and agencies aided in the main relocation challenges. The Polish-Ukrainian Chamber of Commerce (PUIG), established in 1992, actively supports companies relocating from Ukraine to Poland. PUIG provides entrepreneurs with information on the local market, laws and regulations, making it easier to adapt to the Polish business environment. The Chamber also offers training and facilitates the establishment of contacts with business partners in Poland. ‘Usually, relocation practices with us are very quiet; however, I must say that we adopt the position ... that no one here is waiting for you with their product, everything is already here. If you want to enter the market, get to know the market, find your place, or decide to leave’ (interview, institution 21). Most of PUIG’s activities during the war were directed at manufacturing companies, not high-tech companies, so the aid was short-term. ‘These are manufacturing companies, for example, producing sweets or canned goods. Moreover, these are training companies’ (interview, institution 21). ‘Individual cases include either family businesses (for example, chocolate manufactories) or smaller production plants’ (interview, institution 18).

In contrast, let us look at the government programme in Poland. Business Harbour (PBH), launched in 2020, aims at enabling individual IT specialists, start-ups, and IT companies from the high-tech or highly specialised manufacturing sector to quickly relocate to Poland. At the same time, it is not a programme dedicated exclusively to Ukrainians, it was created in 2020 as an initiative of the Chancellery of the Prime Minister and the Ministry of Development and Technology in cooperation with the Ministry of Foreign Affairs, the Polish Investment and Trade Agency, the Polish Agency for Enterprise Development, the Startup Hub Poland Foundation, and the Software Development Association Poland (SoDA) IT Services Employers’ Organisation. Initially, it supported Belarusian companies, but in 2022, it extended its support to companies from other post-Soviet countries: Armenia, Azerbaijan, Belarus, Georgia, Moldova, Russia and Ukraine.

‘The Wroclaw Agglomeration Development Agency was directly approached by several companies, particularly from the ICT sector; a significant number of enquiries also came to us through the Polish Investment and Trade Agency and their ‘Poland. Business Harbour’ programme’ (interview, institution 18).

‘The main objective of the Poland Business Harbour programme, in addition to providing broad support, was to facilitate obtaining a Poland Business Harbour – type national visa. This visa essentially allows smooth passage to Poland. Individuals holding these visas as part of their corporate relocation needed neither a residence permit nor permission to undertake professional work. During the duration of this visa, typically the first year, they could immediately take up employment in Poland. We issue so-called visa recommendations, which are then forwarded to ministries, consulates, or visa centres’ (interview, institution 22).

Participants of the PBH Programme Business Path receive assistance in the visa application procedure and can also rely on free support in obtaining macroeconomic, human resources, and sector reports, assistance in finding the optimal location for an investment or office, facilitating contacts with government and local government institutions, organising site visits and meetings with stakeholders, providing information on public funding, and identifying potential business partners. The programme was expanded as a result of the war in Ukraine to include dedicated training for Ukrainian businesses fleeing the war (for example, a series of training courses on ‘Relocation from A to Z’ conducted in 2022).

‘We are Ukrainian firms with a strong presence in Poland, but we are also firms that have been newly established in Poland. We are start-ups that have been founded in Warsaw, and we are firms that have launched typical ventures in Poland. Currently, we have about 15 active projects involving Ukrainian firms, but we can say that since the beginning of the war, there have been about 10 projects at the relocation stage, meaning they are exploring the possibility of establishing a company in Poland’ (interview, institution 22).

Moreover, the Diia Agency established a branch in Warsaw, as an extension of one of the most widespread business support institutions in Ukraine under the Ministry of Digital Transformation of Ukraine. It began its operations on 18 May 2022 in response to the demands of the current military situation, migration, and the relocation of business entities. It provides professional consultations on legal matters, accounting, taxation, auditing, recruitment of skilled personnel, and other issues related to the management and development of entrepreneurial activities in Poland for Ukrainian citizens and small and medium-sized businesses in Ukraine. In summary, these institutions have provided access to information and comprehensive support of a legal, logistical, organisational, and psychological nature. ‘In addition to the main types of business consulting for Ukrainians abroad, we offer a lot of interesting information, including general cases, news, and information for those who decide to register as entrepreneurs, as well as trainings’ (interview, institution 23).

Another common feature was the high level of collaboration in the relocation process. This collaboration was evident on many levels, starting from business organisations and clusters to company branch networks, and even family and social networks, which were particularly important in the case of SMEs.

‘We still began with the needs of the entrepreneur. We had a database of resources... we shared direct phone numbers to the facilities’ owners. The relocants made their own choices and arrangements. Then came the process of establishing infrastructure. We launched a Telegram channel to search for facilities. We approached strong players in the region who acted as psychologists for the relocators, simply talking to them in a genuine way. Scaling up within Ukraine during the war, I saw companies entering foreign markets, not only within Ukraine, and for them, it was a kind of bridge that all the big companies actually needed. Now, there is a completely different dynamic. They are looking at how they can not only save their business but also improve their economic model’ (interview, institution 8).

Lastly, it is noteworthy that a common characteristic of the relocation processes, both within Ukraine and from Ukraine to Poland, was the arduous task of conducting operations amidst the unique and challenging war conditions. These circumstances were characterised by the complex psychological states experienced by entrepreneurs and employees, which were unquestionably more severe in Ukraine compared to Poland.

### **Differences in the Relocation Mechanisms Between Poland and Ukraine**

Despite some common features, the relocation processes in Ukraine and Poland differ in many aspects and on many levels. Firstly, there are two distinct approaches to relocation. In Ukraine, the emphasis is on maintaining and developing the domestic IT sector, which was regarded as a strategic sector during the war. The reasons for this are manifold. Firstly, there is financial support for war efforts and innovations in the military-tech sector.

In Poland, the relocation of firms from Ukraine is regarded as FDI and support for innovation ecosystems. The following quote from an interview (interview, institution 18) illustrates this point: ‘Companies that decided to relocate and accomplished it quickly found their place in the local market and contributed to the development of the local business ecosystem. Some of these companies joined existing regional associations, such as IT Corner or SoDA. These companies also started participating in increasingly frequent events, such as meetups, conferences, trade fairs, *etc.* The presence of new IT entities in the local market enriched our local ecosystem.’

The processes themselves were also organised in different ways. In Ukraine, a centralised approach was adopted due to Marshal Law, with assistance provided through the PROZORO platform (Ministry of Economy of Ukraine, Ministry of Infrastructure of Ukraine), logistical support for asset and employee

relocation (Ukrposhta, Ukrzaliznyca), and on-site adaptation (regional military administration). In Poland, apart from organisations with a nationwide reach, a decentralised approach prevailed. This meant that each city prepared support for relocated Ukrainian businesses in its way.

For example, in Warsaw, there was no significant involvement of the Municipal Office in the relocation processes, with institutions directly dealing with foreign enterprises, such as the Polish Investment and Trade Agency and Polish-Ukrainian Chamber of Commerce, being more involved. In Wroclaw. However, ‘as the local agency for the relocation of foreign companies,’ the Investor Support Department, Business Support Centre of the Wroclaw Agglomeration Development Agency ‘has been actively involved in the relocation of foreigners to Wroclaw’ (interview, institution 18).

These contrasting approaches illustrate not only the distinct strategic priorities of each country but also their varied methods of supporting and integrating businesses relocating from Ukraine, reflecting broader economic and geopolitical contexts. Understanding these differences is crucial for all stakeholders aiming to optimize support frameworks and foster sustainable economic growth in both regions.

### **Varied Challenges Faced by Relocated SMSs in Poland and in Ukraine**

Moreover, as reported by the interviewees, the challenges related to high-tech SMSs relocation vary between Ukraine and Poland (Table 2). In Ukraine, businesses encounter critical issues such as securing suitable premises with reliable utilities like electricity, heating, and internet amidst the backdrop of military mobilisation and ongoing war. Furthermore, psychological strain among employees and the threat of material damage due to military actions pose significant hurdles. Ensuring business continuity under wartime conditions adds another layer of complexity, requiring measures such as alarm systems and proximity to bomb shelters.

**Table 2. Specific challenges of relocated SMEs: Insights from interviews**

Ukraine	Poland
<ol style="list-style-type: none"> <li>1. Renting premises with proper electricity, heating, and internet connection.</li> <li>2. Availability of electric generators.</li> <li>3. Military mobilisation of employees.</li> <li>4. Complex psychological state of people.</li> <li>5. Destruction of material assets due to military actions.</li> <li>6. Ensuring business continuity and employee safety during wartime (availability of alarm notifications, proximity to bomb shelters, or compliance with the ‘two-wall rule’).</li> </ol>	<ol style="list-style-type: none"> <li>1. Correct choice of form of economic activity during company registration.</li> <li>2. Need to conduct thorough market analysis.</li> <li>3. Adjustment to the EU tax system and significant level of bureaucratisation.</li> <li>4. Adaptation to the business culture in Poland.</li> <li>5. Lower intensity of conducting economic activities.</li> <li>6. Need to ensure transparency of activities – exclusion of corrupt elements.</li> <li>7. Language barrier.</li> <li>8. Adaptation of employees and their families in a foreign country.</li> </ol>

Source: own study based on the interviews.

Support in Poland focuses on differences in legal regulations, business culture (transparency, taxes), and language. Conversely, SMEs relocating to Poland encounter challenges more aligned with navigating legal frameworks, adapting to EU tax standards, and managing bureaucratic procedures. The adjustment to Polish business culture and overcoming language barriers also feature prominently. The emphasis on transparency and the exclusion of corrupt practices further distinguishes the challenges faced by businesses in Poland.

This comparative analysis underscores the diverse operational landscapes SMEs navigate when relocating between Ukraine and Poland, shaped by unique socio-economic contexts and regulatory environments.

## Companies' Relocation Strategies

### Specificity of IT Companies' Relocation

We can analyse the importance of the Ukrainian IT sector during the war in military, economic, volunteer, product, and cyber terms (Mukhina, 2023). Firstly, more than 7 000 IT specialists joined the Ukrainian army (about 3% of the total). These include former software and product design engineers in infantry, artillery, and airborne brigades. Secondly, the IT sector is a strong and stable element of the Ukrainian economy, showing high resilience to war risks due to its specific characteristics. According to the National Bank of Ukraine, in 2022, IT companies paid USD 1 billion in taxes to the state budget and attracted USD 350 million in investments. Thirdly, the IT sector provides voluntary financial support for Ukraine's armed forces. High and stable incomes allow IT professionals to contribute significant funds to help Ukraine through individual contributions (monthly salaries often exceed USD 3 000, which is five to six times higher than the average salary in the country). As of March 2023, the IT industry has contributed more than USD 500 million to the country's victory over Russian invaders. Fourthly, the IT sector has focused some of its activities on developing technological solutions and products that save lives and provide an edge in military operations. Successful and socially useful examples of tools developed as a result of the Russian invasion include the interactive map that provides an up-to-date and detailed visualisation of military operations (DeepStateMap.Live), alert applications (Alert), and a machine learning-based missile defence system (Zvook). Fifthly, IT specialists are fighting in virtual space. Their mission is both to repel Russian cyberattacks and to take countermeasures.

According to the interviews, IT company relocation has its characteristics. First of all, relocating an IT company is less complicated because these companies require specialised equipment, warehouses, and production spaces to a lesser extent than other companies, such as manufacturing. The IT business primarily requires access to computers, a stable power source, and the internet, as servers are usually located abroad. Therefore, employees can, at least for some time, work from home or in coworking spaces (interviews, institutions 9, 11, and 15). Another factor explaining the specificity of the relocation of Ukrainian IT companies is their prior experience of operating in an international environment, which is richer than the experience of companies from other sectors. Retaining current clients from different countries favours the fluidity of business operations (interviews, institutions 8, 14, 16, and 24). The experience of Ukrainian IT companies is due to high professional competence and business English skills. Furthermore, young IT professionals are highly prepared to start their business in new conditions and understand the benefits of such a move (stability, comfort, official salary in Europe, *etc.*). An interview at Polish-Ukrainian Chamber of Commerce confirms this: 'Indeed, people who leave are valuable people in economic life because they are entrepreneurs who can function ... beyond borders' (interview institution 21). Ukrainian IT professionals are highly valued abroad, so it is easier to confirm their qualifications and professional skills compared to other industries (interviews, institutions 7, 8, and 12).

The high degree of adaptability and self-determination is attributed to the limited support provided to such companies by various support institutions, owing to their high level of independence and rapid adaptation in areas of relocation (interviews, institutions 15 and 18). 'Those entrepreneurs who can manage on their own go to Warsaw, because those who have their own companies will find a way to manage, one way or another' (interview, institution 15).

Favourable conditions for foreign IT professionals in Poland have streamlined procedures for foreign IT specialists, facilitating the process of obtaining work permits and integrating into the local business environment. Poland offers special working conditions for foreign IT specialists, particularly from other post-Soviet countries, which is crucial when preparing a package of documents to obtain a work permit abroad. 'The programme implemented by the Polish Investment and Trade Agency, Poland Business Harbour, has been a great help. It was instrumental in handling the formalities related to relocation to Poland, such as obtaining appropriate visas, *etc.*' (interview, institution 18).

'Our work is to assist Ukrainian companies that are forced to relocate to Poland or are planning to relocate to Poland. The Poland Business Harbor programme is mainly designed for high-tech compa-

nies that relocate not only from Ukraine but also from other countries. The main purpose of this programme, in addition to providing broad support for these companies, was the ability to obtain a national D-type visa. This visa essentially allowed for a very smooth transition to Poland ... Individuals who held this visa as part of company relocation needed neither a residence permit nor permission to undertake professional activities. During the visa's validity, typically the first year, we could take up employment in Poland immediately' (interview, institution 22).

Each relocation is a unique economic and social phenomenon, and the impact on an IT firm can vary depending on the specific circumstances. Planning and coordination of the relocation process are essential to maximise the benefits and mitigate potential negative impacts. There are differences in the planning, coordination, and financing of the relocation process between large and small IT companies.

### **Strategies for Relocation of Small IT Firms**

The interviews allowed us to distinguish several features of the relocation strategies of small Ukrainian firms under wartime conditions. The foundation is prioritizing employee safety during wartime relocation. Entrepreneurs and business owners took necessary steps to reduce risks for themselves and their employees by implementing emergency evacuation measures: 'The most important thing now is to preserve the remaining potential of the firm and the talent pool we have (...) the region we chose is calm, safer, and therefore allows us to work productively, unlike the eastern regions' (Company 2). Owners have also worked to re-register their businesses in new locations and secure internally displaced person status for employees to restore operational processes and maintain team integrity. For example, employees were provided with workspace during the relocation, rented hotel accommodations for themselves and their families, and received financial assistance for adaptation (Company 1).

Another essential feature of wartime relocation strategies is a short-term planning horizon, evident in the tendency among employees to continue working with an expectation of return. This mindset is often accompanied by psychological strain due to the ongoing threats to life and health, sudden forced relocation, and drastic changes in personal and professional plans. Firms typically remain in a 'wait-and-see' mode regarding future developments and outcomes of the conflict: 'As for new opportunities for the company's development in a new location, we do not talk about it' (Company 2).

For companies that relocated abroad, an additional feature involves adapting to differences in the legal framework between Poland and Ukraine. Establishing a new business entity, changing tax residence, and legalizing employee activities through relevant legal mechanisms in Poland were mandatory to continue business operations. Owners often encountered challenges in restoring team integrity and adapting to the numerous and slow-paced bureaucratic processes: 'We chose Poland as the place of relocation because it has the simplest tax legislation and comfortable conditions for starting a business. The downside is the significant bureaucracy in the state authorities and their slowness' (Company 4).

A prevailing feature of these firms' relocation strategies is cost-cutting; however, some new opportunities have also been recognized. Lower operational costs and existing family and business ties were significant factors in selecting a new location. Company 3 noted: 'We expressed a desire to move to Rivne, a much smaller city. Here, we were satisfied with much lower prices for apartments for employees and office rent' (Company 3). Company 6 similarly shared: 'Together with my family, we moved to a small town in Poland, where all logistical issues are easier to resolve. We work online. We gathered information bit by bit (...), and there have been no significant changes' (Company 6).

Additionally, some respondents identified benefits from relocating to EU countries. A notable case involved a double relocation, where the owner initially left Donetsk in 2014 for Rivne, later moving to Poland and establishing a business there during the full-scale invasion. 'The choice to relocate to Poland came about spontaneously in the early summer of 2022. I left with my family, and the adaptation process was difficult for them. Since we also have family members in other European countries, we will most likely make a third relocation' (Company 5). Another company observed: 'there is some positive momentum because we are in Europe. We have the opportunity to consider where to move forward and how to develop' (Company 6).

The interviews allowed also to identify the factors determining the choice of a particular relocation site. The dominant elements in this respect were randomness, combined with the use of existing con-

tacts, both business and personal, and, in the case of relocation to Poland, the vision of a change in the concept of business operation concept – *i.e.* using the threat as an opportunity for a new way of operating the company – played a major role. Based on the knowledge gained we formulated four types of relocation strategies implemented by small and medium-sized businesses. These are as follows:

1. Strategy for maintaining and restoring business operations (for firms that have been severely or partially affected by the hostilities) (Company 2 and 3).
2. Diversification strategy (entering new markets, including export markets) (Company 4).
3. Cost-cutting strategy (to reach or maintain business operations at a level that is viable during a full-scale war) (Company 6).
4. Strategy to revive the business in a radically new environment (Company 5).

### **Strategies for the Relocation of Large IT Companies**

Based on desk research, we identified several distinctive elements characteristic of the relocation strategies implemented by large companies with more than 1 500 IT employees. Firstly, strategic preparedness emerged as a crucial aspect of relocation strategies of these companies. GlobalLogic, EPAM, and SIGMA Software demonstrated their preparedness by implementing well-coordinated plans. These plans involved close collaboration with hotels and transportation companies to ensure a seamless transition for their employees.

Secondly, business continuity was a top priority for these IT firms. GlobalLogic's notable efforts included organising the evacuation and relocation of 14 000 employees from various regions in Ukraine. To support their employees during this transition, the company established a 24/7 helpline and provided financial assistance. EPAM also prioritised business continuity, offering financial support to its employees and successfully resuming project work without interruptions.

Thirdly, agile adaptation was a shared approach. These firms relocated specialists within Ukraine to ensure uninterrupted operations. Moreover, some firms, including SIGMA Software, expanded internationally by establishing branches in locations such as Burgas (Bulgaria), Lisbon (Portugal), New York (USA), Prague (Czech Republic), Stockholm (Sweden), and Hungary. This agile approach allowed the firms to diversify their presence and mitigate risks.

Fourthly, accommodation management played a crucial role in facilitating the relocation process. Luxoft, GlobalLogic, and EPAM implemented effective practices in this regard. Luxoft established an accommodation team that assisted over 140 employees and their families in finding suitable housing. Similarly, GlobalLogic and EPAM ensured smooth accommodation logistics for their relocated employees, minimising disruptions during the transition. Furthermore, future expansion plans were considered by some firms. EPAM planned to open new offices in Poland, while Itellias aimed to establish new offices and development centres in various locations (Polunina, 2022).

These expansion initiatives demonstrated the firms' growth vision and confidence in adapting to new markets. The relocation of large IT firms was part of important strategic decisions aimed at achieving various goals, primarily saving employees and preserving business units. Beforehand, we thoroughly evaluated the relocation decisions with a rapid but consistent assessment of potential locations. The main criteria for making a relocation decision, in addition to safety, included developed infrastructure, tax advantages, economic stability, a robust business ecosystem, and the availability of a highly skilled workforce, among others.

Relocation requires consideration of socio-cultural aspects. Firms provided support to their employees to help them adapt to the new location. One of the key factors for IT firms' relocation is access to highly skilled and talented workers. Companies sought regions or cities with a significant concentration of tech professionals.

Furthermore, IT companies have considered relocating to countries where tax policies are favourable to their business, such as Poland. Some regions or countries offer special tax conditions to attract investment and business. Relocation has provided large IT firms with the opportunity to expand their global presence by accessing new markets where the demand for technology may be greater. By making strategic relocation decisions and consistently adapting both firms and employees in a reasonable

manner, choosing a strategy that is adaptive to the situation, can help large IT firms maximise the benefits of relocation and reduce the potential risks.

## CONCLUSIONS

The study revealed the multifaceted nature of the relocation of Ukrainian IT companies during Russian aggression of Ukraine. Interestingly, the proactive large-scale relocation that began before the full-scale war, indicating the severe security challenges these companies faced and the precautionary measures they took to safeguard their operations.

Different sets of rules and factors shape the relocation patterns within Ukraine and from Ukraine to Poland. In Ukraine, government programmes and regional marketing strategies played critical roles in identifying host regions and competing for relocation volumes. Conversely, in Poland, institutions such as the Polish-Ukrainian Chamber of Commerce (PUIG) and the Polish Investment and Trade Agency (PAIH) facilitated the relocation process. In both cases: Poland and Ukraine, the attractiveness of recognised regional IT ecosystems, particularly in cities such as Krakow and Warsaw in Poland and Lviv in Ukraine, played an important role. These regions, characterised by well-established business networks and personal connections, have become attractive locations for relocating IT companies, however, the concentration measures are the highest in regions neighbouring Ukraine. The importance of existing business networks of family and friends used by companies in the relocation process and the serendipity of some relocations should also not be overlooked. The findings underscore also the importance of flexible and adaptive strategies in business relocation during crises. Smaller SMEs tend towards short-term planning, reacting pragmatically to the dynamic situation, whereas larger companies show strategic adaptability.

## Recommendations and Implications

The relocation of Ukrainian IT companies in response to Russia's aggression has complex and multifaceted implications at organisational, regional, and national levels. At the organisational level, the primary motivation for relocation was to secure business operations, protect employee welfare, and preserve corporate assets. The strategic decision to relocate a company unlocks access to new markets in the European Union, diversifying revenue streams. Relocated IT companies integrate into established innovation and economic ecosystems, fostering synergies that stimulate growth. Moreover, these facilitate access to new sources of grants and credit, supporting sustainable business growth.

At the regional level, these relocations revitalise innovation ecosystems and contribute to regional budgets. In Poland, the relocated IT entities are treated as foreign investors and their presence is assessed in positive terms as a factor strengthening regional economies and demonstrating investment attractiveness. Research has not revealed any significant competition between Polish regions in terms of attracting Ukrainian IT companies. The situation is different in Ukraine, where the backward regions, where relocated companies are located, compete to attract relocated companies by offering incentives to stimulate regional development.

At the national level, while relocation helps preserve Ukraine's vital IT sector, it also poses challenges such as brain drain and economic weakening due to reduced tax revenues. However, in the long term, these relocations could result in positive outcomes as Ukrainian companies better adapt to the EU framework, enhancing transparency and corporate governance standards, thus supporting Ukraine's economic convergence with the EU.

Despite the significant criticism of the relocation of Ukrainian IT companies abroad, several concurring arguments can be identified. The first is related to the complexity of the relocation process. Many companies, despite their physical presence in Poland, still carry out similar work remotely, serving the same markets. Secondly, the dynamics of relocation processes are very high, we are aware on the multiple relocations of the companies long term effects are speculative. Thirdly, in the long term, relocations to countries such as Poland can bring positive results. With the experience gained in Poland, Ukrainian companies are likely to better adapt to the EU legal framework and business culture,



increasing transparency and corporate governance standards. Such adaptation has the potential for Ukraine's long-term convergence with the economic and regulatory framework of the European Union.

Effective support for the relocation of small IT firms requires, first and foremost, continuous monitoring of relocation processes and regular assessments of the evolving needs of these businesses. Insights from this monitoring can inform targeted support measures, allowing governments and regional authorities in both Ukraine and Poland to enhance infrastructure, offer tax incentives, and create favourable business environments. Additionally, international cooperation, especially with the EU, could aid in aligning business practices with European standards, promoting long-term economic stability and growth.

### Research Limitations

The study focused on companies that physically relocated either within Ukraine or to Poland, excluding those that continue to operate remotely, which poses a limitation in capturing the full scope of the phenomenon. Moreover, the dynamic nature of the war and the ongoing relocations make it challenging to provide a comprehensive analysis of long-term effects. The reliance on interviews and limited available data also introduces potential biases, limiting the findings' generalisability.

### Suggestions for Further Studies

Future research should explore the long-term economic impacts of these relocations on both the Ukrainian and Polish economies. It would be valuable to assess how relocated companies adapt to new legal and business environments over time and how these relocations influence the broader IT ecosystem in both countries. Comparative studies involving other war-affected regions could also provide deeper insights into the global dynamics of business relocation under similar conditions.

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**Appendix: List of interviews****Table A1. List of interviewed companies and their characteristics**

<b>Company designation</b>	<b>Characteristics based on the interviews</b>	<b>Date</b>
<b>Ukraine</b>		
Company 1	Relocated from Kyiv (UA) to Ivano-Frankivsk (UA) The employees of the relocated IT company's department were provided with a secure workplace and rented hotels for the relocated employees and their families.	10 March 2023
Company 2	Relocated from Dnipro (UA) to Ternopil (UA) Complicated psychological state of workers, the constant expectation of return.	20 March 2023
Company 3	Relocated from Kyiv (UA) to Rivne (UA) Relocation due to familiarity with the new facility and low cost of living.	22 March 2023
<b>Poland</b>		
Company 4	Relocated from Kyiv (UA) to Wroclaw (PL) Small company, operating in the field of software and information and computer technology services. After relocation, the owner had problems with the legalisation of workers not from Ukraine but from other foreigners.	21 March 2023
Company 5	Relocated from Rivne (UA) to Poznan (PL) Small company, engaged in data processing, website management, service activities in the field of information and computer technologies, and Internet portals. The owner of the company as an individual relocated at the beginning of the war from Donetsk to Rivne, since the full-scale war his second relocation already as the owner of the company from Rivne to Poznan took place.	12 April 2023
Company 6	Relocated from Lviv (UA) to Czerwone (PL) Small company, engaged in activities related to software, IT consultancy, data processing, and website management. After relocation, only remote work was organised.	18 April 2023

Source: own study.

**Table A1. List of interviewed institutions**

<b>Institution Designation</b>	<b>Interviewee/Department</b>	<b>Date</b>
<b>Ukraine</b>		
Institution 1	Ministry of Economy of Ukraine, First Deputy Minister	09 January 2023
Institution 2	Sumy Regional Military Administration, specialist of the Department of International Cooperation and Economic Policy	25 November 2023
Institution 3	Zaporizhzhia Regional Military Administration, First Deputy Head of the Regional Military Administration	05 December 2022
Institution 4	Kyiv Regional Military Administration, Head of the Economic Department	07 December 2022
Institution 5	Kherson Regional Military Administration, Director of the Department of Economic Development	15 December 2023
Institution 6	Odesa Regional Military Administration, specialist of the Department of Economic Policy and Strategic Planning	16 December 2023
Institution 7	Rivne Regional Military Administration, specialist of the Department of International Cooperation and European Integration	19 December 2022
Institution 8	Lviv Regional Military Administration, Head of Investment Attraction Department	21 December 2022
Institution 9	Ternopil Regional Military Administration, Director of the Department of Economic Development and Trade	12 January 2023
Institution 10	Vinnytsia Regional Military Administration, Specialist of the Department of International Cooperation and Regional Development	20 January 2023
Institution 11	Volyn Regional Military Administration, Deputy Head of the Economic Department	25 January 2023
Institution 12	Khmelnyskyi Regional Military Administration, Department of Economic Development	17 February 2023
Institution 13	Ivano-Frankivsk Regional Military Administration, Deputy Head of the Regional State Administration for Digital Development, Digital Transformation and Digitalisation	03 March 2023
Institution 14	Zakarpattia Regional Military Administration, specialist of the Department of Regional Development	25 April 2023
<b>Poland</b>		
Institution 15	Municipal Office, Warsaw, specialist of the Economic Development Office with the Entrepreneurship Centre in Warsaw City Hall	15 December 2022
Institution 16	Municipal Office, Cracow, specialists of the Investor Service Department in Cracow City Hall	11 January 2023
Institution 17	Municipal Office, Katowice, Head of Investor Support Department, Business Incubator, Deputy Head of Investor Support Department	21 February 2023
Institution 18	Municipal Office, Wroclaw, Head of Investor Support Department, Business Support Centre of Wroclaw Agglomeration Development Agency	25 May 2023
Institution 19	Municipal Office, Poznan, Specialist of Investor Service Office	20 June 2023
Institution 20	Polish Investment and Trade Agency, Warsaw, Project Department Expert	09 December 2022
Institution 21	Polish-Ukrainian Chamber of Commerce, Warsaw, Director of Business Consultancy Centre (Business Relocation Centre) Polish-Ukrainian Chamber of Commerce	12 December 2022
Institution 22	Poland Business Harbor, Warsaw, Trade Programme Experts and Experts of Poland Business Harbor	16 December 2022
Institution 23	Dija Business Warsaw, expert of the Dija Business centre in Warsaw	18 January 2023
Institution 24	Cracow Technology Park, Vice President of the Management Board of the Cracow Technology Park	23 January 2023

Source: own study.

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Agnieszka Olechnicka (65%): Conceptualization, Methodology, Data Acquisition, Analysis and Curation, Conducting Interviews in Poland, Structuring the Paper, Writing the Original Draft, Reviewing and Editing, Funding Acquisition. Anna Kniazevych (35%): Conducting Interviews in Ukraine and Poland, Reviewing Ukrainian Literature and Law, Writing the Original Draft, Reviewing and Editing.

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### Acknowledgements and Financial Disclosure

The authors thank all interviewees from various institutions for sharing their insights on firm relocations. They also express gratitude to the Polish Economic Institute (PIE) for providing pre-processed data from the Central Economic Information Centre (COIG) and the Central Register and Information on Business Activity (CEIDG) regarding companies with Ukrainian capital and sole proprietorships established by Ukrainians in Poland. Additionally, they appreciate the editorial board of the journal *International Entrepreneurship Review* and the reviewers for their valuable comments, which inspired further research.

The University of Warsaw supported this publication under Excellence Initiative – Research University (IDUB) New Ideas Ukraine.

### Use of Artificial Intelligence

AI/GAI tools were used in a limited and non-substantive capacity. Specifically: 1. an automatic transcription tool integrated with Google Docs was used to transcribe recorded interviews; 2. ChatGPT was used for linguistic proofreading of the manuscript. No AI tools were involved in data analysis, interpretation, or the formulation of research conclusions.

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Published by Krakow University of Economics – Krakow, Poland

