

ISBN 978-83-975865-2-9

# Transport Problems 2026

## INTERNATIONAL CONGRESS PROCEEDINGS



fot. Wojciech Kamiński

UNDER THE HONORARY  
PATRONAGE OF



Silesian  
University  
of Technology



Polish National  
Association of  
Doctoral Candidates

**KRD**



XVIII INTERNATIONAL  
SCIENTIFIC  
CONFERENCE

24-26.06 2026

Katowice - Łódź

22-23.06.2026

Katowice

XV INTERNATIONAL  
SYMPOSIUM OF YOUNG  
RESEARCHERS



Silesian University of Technology  
Faculty of Transport and Aviation Engineering

# Transport Problems 2026

INTERNATIONAL CONGRESS

## Proceedings

XVIII International Scientific Conference

XV International Symposium of Young Researchers

UNDER THE HONORARY PATRONAGE OF



Silesian University  
of Technology



Polish National  
Association of  
Doctoral Candidates



Transport Problems  
*International Scientific Journal*

ISBN 978-83-975865-2-9

*editor-in-chief*

**A. Sładkowski**

*editorial board*

*M. Bepko, P. Czech, M. Cieśla, T. Haniszewski,  
M. Juzek, W. Kamiński, P. Marzec, G. Wojnar*

*CONFERENCE -  
TABLE OF  
CONTENTS*

*SYMPOSIUM -  
AUTHORS LIST*

*CONFERENCE -  
AUTHORS LIST*

*CONFERENCE &  
SYMPOSIUM  
PROGRAM*

*SYMPOSIUM -  
TABLE OF  
CONTENTS*

*CONFERENCE &  
SYMPOSIUM  
PROCEEDINGS*

*CONFERENCE  
PRESENTA-  
TIONS*

*SYMPOSIUM  
PRESENTA-  
TIONS*

**INTERNATIONAL CONGRESS  
“TRANSPORT PROBLEMS”  
22-26 June 2026  
includes  
XV International Symposium  
of Young Researchers  
TRANSPORT PROBLEMS**

**TABLE OF CONTENTS**

No.	Author, title	Pages	
		Begin	End
1	Lorenzo BROCCINI, Antonio PRATELLI, Daniele CONTE, Alessandro FARINA, Massimiliano PETRI A sustainable approach to tourism logistics: the “portable” research project	<a href="#">668</a>	681
2	Aleksander CETNAR, Szymon JAROSZ, Michał BIDAS, Wioletta CEBULSKA Analysis of drone propeller damage under operational conditions for selected materials	<a href="#">682</a>	690
3	Tatiana DUDNIK, Aleksander SŁADKOWSKI Analysis of transport flows in a context of political instability	<a href="#">691</a>	700
4	Andrzej FELSKI, Krzysztof JASKÓLSKI, Marek KUBICKI Is the ALPHA Russian radionavigation system still active?	<a href="#">701</a>	716
5	Wasihun KENO, Janusz SZPYTKO Reliability and life-cycle cost assessment of urban bus fleet maintenance strategies using Weibull analysis and multi-criteria decision analysis	<a href="#">717</a>	727
6	Wasihun KENO, Janusz SZPYTKO Leak detection mechanisms in large-format batteries for electrified public mass transport: safety, lifecycle impacts, and system-level integration	<a href="#">728</a>	739
7	Daud KHAN, Katarzyna MARKOWSKA Modeling fuel consumption and transportation emissions in mixed traffic based on driver response	<a href="#">740</a>	750
8	Marcin MICIAK, Nicolas KEPA, Łukasz GERST, Maria CIEŚLA Analysis of air traffic and assessment of the attractiveness and possibilities of aviation training in the Silesian voivodeship	<a href="#">751</a>	761

**Keywords:** global transportation; migration; Ukraine; Russia; logistics; political instability

**Tatiana DUDNIK\*, Aleksander ŚLADKOWSKI**

Silesian University of Technology  
Krasiński 8, 40-019 Katowice, Poland

\*Corresponding author. E-mail: [Tatiana.Dudnik@polsl.pl](mailto:Tatiana.Dudnik@polsl.pl)

## **ANALYSIS OF TRANSPORT FLOWS IN A CONTEXT OF POLITICAL INSTABILITY**

**Summary.** Political instability in Eurasia is particularly acute due to the long-running war between Ukraine and Russia. This conflict has caused significant disruptions to transport corridors, the supply of goods, and so on. However, no research has yet been conducted into how the migration of educated people from the warring countries has contributed to the development of global transport and logistics in the host countries. The aim of this article is to identify which European countries have benefited most from the migration of people from Ukraine and the Russian Federation. Using regression analysis, the paper demonstrates the relationship between the increase in the proportion of the aforementioned migrants and the development of transport and logistics in 10 European countries. The greatest beneficiaries were Bulgaria, Poland, Spain and Cyprus, and to a slightly lesser extent, Portugal.

## **АНАЛИЗ ТРАНСПОРТНЫХ ПОТОКОВ В УСЛОВИЯХ ПОЛИТИЧЕСКОЙ НЕСТАБИЛЬНОСТИ**

**Аннотация.** Политическая нестабильность в Евразии особенно остро характеризуется долго длящейся войной между Украиной и Россией. Этот конфликт вызвал серьезные сбои в функционировании транспортных коридоров, поставок товаров и т.п. Однако до сих пор не было исследовано, как миграция образованных людей из воюющих стран помогла развитию глобальных перевозок и логистики в принимающих странах. Цель статьи: определить, какие страны Европы в наибольшей степени выиграли от миграции людей из Украины и РФ. С помощью регрессионного анализа показана зависимость между ростом удельного веса вышеуказанных мигрантов и развитием перевозок, логистики в 10 странах Европы. Наибольшими бенефициарами стали Болгария, Польша, Испания, а также Кипр, в несколько меньшей степени — Португалия.

### **1. INTRODUCTION**

Over the past few years, global trade, transport, and logistics have increasingly faced exogenous shocks, disrupting global shipping [1-3]. Along with increasingly frequent natural disasters and pandemics, new conflicts have emerged, and nationalism and protectionism have grown [4-6]. In 2025, trade wars became permanent, as the United States began imposing tariffs on virtually every country, then changing rates and deferring implementation of some decisions. The Russian-Ukrainian war has lasted for over four years, a war has broken out in Iran for the second time in a short period, and terrorist attacks on merchant ships remain a persistent problem.

The world has been plunged into political instability, and one of its most significant manifestations in Eurasia is the Russian-Ukrainian war. As shown in the next section, many academic papers attempt

to study the negative impact of this war on various sectors of shipping and transportation. However, war can generate multiple influencing factors, and not always negative ones. This paper focuses on migration to Europe from countries engulfed in military conflict. Consequently, the study fills a significant research gap by focusing on the following issue:

The impact of military migration on international transport and logistics in countries receiving relocated people. What is Europe's experience after four years of a full-scale Russian-Ukrainian conflict?

To address this issue, the following research objective was adopted: to determine which European countries—specifically, their logistics, transport, and international transport—have benefited most from the migration of people from Ukraine and the Russian Federation.

## 2. STATE OF ART

The assumption that European countries may have benefited from migration from the East in terms of transportation is not accidental. For example, studies of self-employment among foreign workers in the UK have shown that the reasons for immigration are a significant factor. Individuals who migrated for family reasons are 3 percentage points more likely to be self-employed than native-born Britons. Refugee migrants are 6 percentage points more likely to be self-employed than native-born Britons, while migrants who arrived for study and work are almost identical. The article concludes that the likelihood of self-employment is higher for groups receiving lower wages for waged employment [7].

As a result of the Russian-Ukrainian war, both Ukrainian refugees and Russians seeking refuge from a totalitarian regime arrived in Europe. Clearly, both sides included entrepreneurs saving their businesses and capital, skilled workers, and generally active individuals capable of improving their economic well-being. The authors of the article [8] tracked waves of Russian emigration following Russia's full-scale invasion of Ukraine, compiling a detailed sociological profile of the migrants. It turned out that the average age of these people was 32 years old, 80% of them had higher education, and there was a high concentration of specialists from the IT industry, science, and media.

An influx of migrants of this caliber, given demographic problems in Europe, should have had a positive impact on various economic sectors in the host countries. Moreover, some authors noted the "decoupling" of supply chains from Russia as an immediate business response to Russian aggression [9]. Some Ukrainian and Russian companies were forced to separate supply chains in order to move production out of the country engulfed in military action or to regain lost markets due to sanctions restrictions and increased risks to the company's existence. This thesis has been confirmed in a systematic literature review [6].

Many scholars have studied the impact of war and other factors of political instability on various sectors of the international economy and transport. Following Russia's initial occupation of Ukrainian territories in 2014, some assessed this impact on Ukrainian business by examining changes in firms' economic performance [10].

At the onset of the full-scale war, studies emerged documenting disruptions to established logistics routes and international trade and proposing urgent measures to optimize the management of these processes. For example, these articles described how the armed conflict caused flight cancellations and changes [11-12], redistributed Russian trade flows, primarily oil and gas [13], changed air, sea, and rail freight transport between Europe and Asia [14], and reshaped global trade—at the beginning of the war, Ukraine experienced significant export disruptions, while Russian exports declined less significantly [13, 15]. The author of the article [16] analyzed a factor that emerged as a result of the war, namely, the agreement between the EU and Ukraine on partial liberalization of road freight transport and its impact on the transformation of this market. Research has examined the combined impact of the COVID-19 pandemic and the Russian-Ukrainian armed conflict on the road freight transport sector in Central and Eastern European countries by analyzing the financial health and liquidity of the relevant companies [17]. The study found that the pandemic had the greatest impact, while the military situation, with some exceptions, did not affect the financial position of transport companies from countries bordering Ukraine. Other authors examined how war-related shocks affected the resilience of trade in Central and

Eastern European countries [18], proposing the Trade Vulnerability Index. The results showed that trade in these countries was resilient to disruptions during the first two years of the war, with the exception of the Baltic states and Poland.

The researchers concluded that the influence of geopolitics on the global economy and logistics represents a new horizon for future research [19]. Policymakers also recognized that international trade was no longer simply about collective prosperity, but could be seen as a potential source of vulnerability, leading the European Union to significantly restructure its approach to international trade [20].

Some researchers, based on their study of changes during the first two years of the war, presented various forecasts and recommendations, such as the development of a network of transit routes through Ukraine [21]. Early forecasts claimed that the long-term global competitiveness of Russian businesses would decline sharply due to three main causes: reduced technology transfer, supply chain disruptions, and a "brain drain" [22]. Thus, the issue of war-induced migration was addressed, but the aim was not to analyze which countries were experiencing this "brain drain" and with what effect.

Migration from Ukraine has been studied since the very beginning of the war. An article [23] analyzed its impact on the labor markets of European countries, noting the significant burden on public funds in host countries, thus attempting to assess the consequences of forced migration. A similar article [24] concludes that a comprehensive approach to forced migration in Ukraine is necessary. Other authors [25] have examined the structure, dynamics, and causes of Ukrainian migration with the aim of proposing measures to return these individuals. The article acknowledges that it will be particularly difficult to influence the re-emigration of highly qualified specialists proficient in foreign languages and IT technologies, who are able to easily adapt to a different culture. However, the work does not address the impact of migration on transportation and logistics in host countries.

When it became clear that the war would not end quickly, forecasts disappeared from scientific papers on this topic, but research into its impact on various areas related to the transportation of goods and logistics continued. Some authors assessed the impact on Ukraine's transport infrastructure and identified financial problems associated with restoration [26], others focused on the dynamics of maritime oil trade, assessing its sustainability in various global corridors [27] and the redistribution of Russian oil markets in other directions [28], others focused on the overall sustainability of global maritime supply chains [29], identifying a certain decline in Russia and Ukraine, and others became interested in the long-term sustainability of alternative food transportation routes, using qualitative research methods [30], etc. Studies of global supply security in the context of the risk of armed and geopolitical conflicts appeared, with an emphasis on land and sea logistics corridors between Europe and Asia. As a result of the war, the capacity of many of them was limited, but strong interdependencies between different transport routes were revealed [31]. Several authors have continued to study the impact of the armed conflict on businesses, particularly transport companies in Poland, examining how they perceive changes in their economic situation and microenvironment compared to the pre-war situation [32]. Companies delivering cargo to Ukraine fared better.

Many authors have examined the impact of this war on the stock markets of BRICS countries [33], as well as on the imports, exports, and supply chains of individual countries, particularly Turkey [34].

Article [35] examines the political and economic situation of the EU as a result of military aggression, as well as European transport policy from the perspective of energy sustainability in the transport sector.

In recent years, studies have appeared on migration under the influence of global threats, but not only from Ukraine. For example, a review [36] examines the phenomenon of the mass exodus of Russian specialists, focusing on digital nomads, through the prism of lifestyle mobility and geopolitics, and analyzes the long-term economic effects on relocation hubs. The authors of the article [37] approached immigration as a crucial element of human capital in developed countries and examined the challenges faced by refugee entrepreneurs. They noted challenges in accessing finance, social support, education, and skills development. The review also highlights the strengths that refugee entrepreneurs can leverage to achieve success.

Obviously, the above-mentioned studies only partially overlap with the subject of the current study. Migration from Ukraine and Russia to European countries and the impact of this process on transportation and foreign trade activities in host countries have not yet been studied.

### 3. RESEARCH AND DATA COLLECTION METHODS

To address the problem, a purposive sampling method was chosen. The advantage of this method lies in its ability to examine the problem in more detail using a sample of countries that are particularly relevant to the research question [38]. For analysis, European countries were selected that had the highest number of citizens of warring countries moving to them between 2022 and 2024. This selection process took place in several stages.

First, a sample of European countries was selected that issued the first residence permit in 2024 to citizens of the top 5 non-EU countries, including Ukraine and/or Russia [39]. According to this criterion, the sample consisted of 18 countries: Bulgaria, Cyprus, Czechia, Germany, Estonia, Greece, Spain, Finland, Hungary, Italy, Lithuania, Latvia, Malta, the Netherlands, Poland, Portugal, Romania, and Slovakia. Panel data were collected for these countries from 2018 to 2024 on the number of first-time residence permits (valid for one year or more) issued annually to citizens of Ukraine and Russia [40]. The total number of such permits for Ukrainians and Russians was calculated.

In the second stage, countries were selected where the increase in the average number of permits issued during the war (2022-2024) compared to the pre-war period (2018-2021) was 40 percent or more. Fig. 1 shows all countries in the first sample with this indicator.

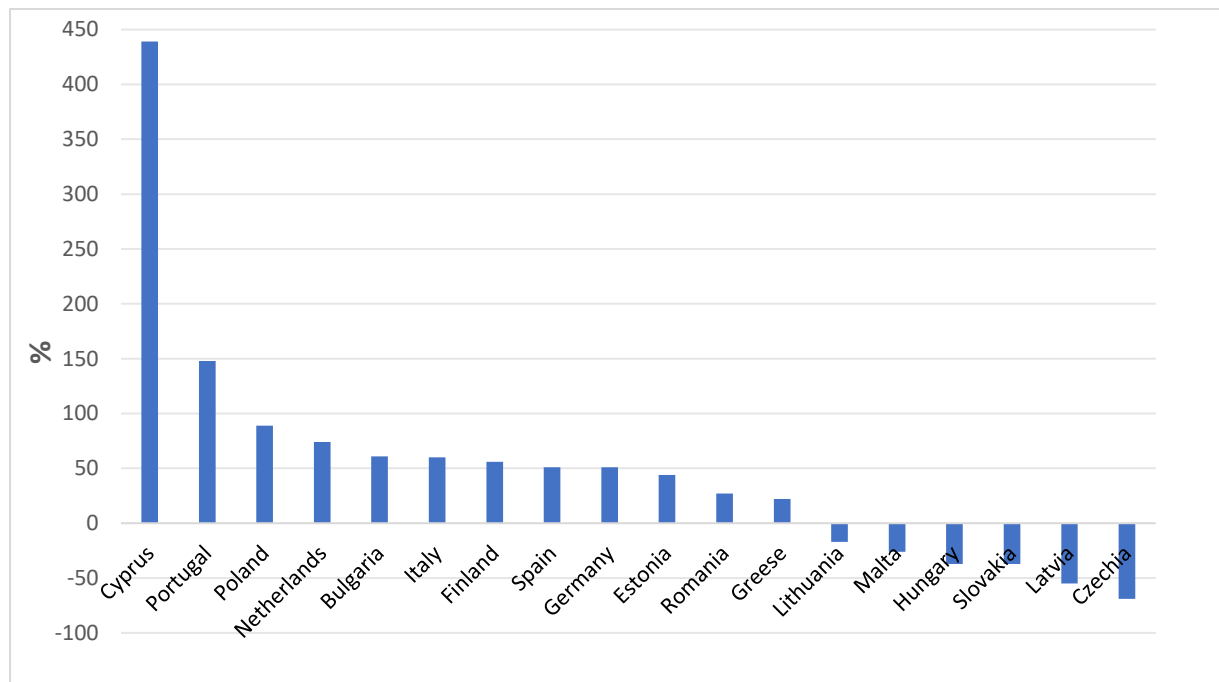


Fig. 1. Change in the number of residence permits issued to citizens of Ukraine and the Russian Federation during the war compared to the pre-war period, %

Рис. 1. Изменение количества выданных гражданам Украины и Российской Федерации видов на жительство в период войны по сравнению с довоенным периодом, %

The second sample included 10 countries: Bulgaria, Cyprus, Germany, Estonia, Spain, Finland, Italy, the Netherlands, Poland, and Portugal. For each country, the proportion of migrants (Ukrainians and Russians) to the total population was calculated [41] for each year of the period under review. This indicator was selected as the independent variable for further analysis using regression analysis with tables and graphs in WPS Spreadsheets software.

As dependent variables, the author used available Eurostat data on transportation in the selected 10 EU countries, namely: passenger air transport, air cargo transport, passenger rail transport, freight rail transport, and freight road transport. In addition, macroeconomic indicators characterizing international transport and supply chains, such as exports and imports, were used [42]. A regression analysis of the above data from 2021 to 2024 demonstrated a correlation between the influx of migrants from Ukraine

and Russia, presumably of "high quality," and the development of transportation and international deliveries in countries that received the largest number of such migrants during the war, thus creating the most favorable conditions for them.

To confirm the positive impact of the above-described migration on logistics quality in the selected countries, the author used the Logistics Quality and Competence subindex, which is a component of the multidimensional LPI index calculated by the World Bank to assess the logistics performance of different countries [43]. In this case, data for 2023 and 2018 were compared (the World Bank published only two reports during the study period) to determine whether there was a positive trend. The author did not consider the LPI index as a whole or the remaining subindices (Customs, Infrastructure, International Shipments, Timeliness), as they are less susceptible to rapid change.

#### 4. RESULTS

The study yielded interesting results in several areas. The war years and associated migration impacted the development of transportation and logistics in the analyzed countries.

Regression analysis revealed a strong correlation ( $R^2 > 0.8$ ) between the share of migrants in the country's population and air passenger transportation in 6 out of 10 cases, and between the share of migrants in the country's population and air cargo transportation in 3 out of 10 cases (two of these countries—Finland and Italy—showed a significant inverse relationship). A strong correlation was found between the share of migrants in the country's population and rail passenger transportation in 5 out of 9 cases. Among the analyzed countries, Cyprus, which has no rail transport, was not included in this analysis. In rail freight transport, a strong correlation was observed in only 2 out of 9 cases (one of which was Finland, where an inverse correlation was observed), while in road freight transport, a strong correlation was observed in 5 out of 10 cases (two of which—Poland and Estonia—with an inverse correlation). Consequently, the influx of migrants from Ukraine and Russia had a positive impact primarily on passenger transport. The exceptions to this trend were Germany and the Netherlands, and partially Finland and Italy, where there was no strong correlation in air transport.

The author found an even more significant correlation between the dynamics of the share of migrants in a country's population and exports/imports, which characterize the development of international transport. A strong correlation ( $R^2 > 0.8$ ) was recorded for both exports and imports in 7 out of 10 cases (see Tab. 1).

Accordingly, a positive correlation between the influx of migrants from countries experiencing military conflict and the growth of foreign trade overall is evident. The exceptions to this trend are Estonia, Italy, and the Netherlands.

Due to its geographical location, Estonia is heavily dependent on trade with Russia and Belarus, so the war and sanctions against its main trading partners have reduced its exports and imports. The exceptional nature of the other aforementioned countries (Italy, the Netherlands, Finland, and Germany) is explained by other factors.

An analysis of the dynamics of the share of Ukrainian and Russian migrants in the country's population during the war shows that this figure began to decline significantly in some countries as early as 2023 (see Tab. 2).

Many countries failed to create comfortable conditions for these migrants, and some even imposed restrictions. For example, Finland imposed entry and transit restrictions for Russian citizens in the fall of 2022, and completely closed its land border in 2023, which impacted passenger traffic. A decline in migrant numbers in 2023 and 2024 was observed in four countries: Italy, the Netherlands, Finland, and Cyprus. This may explain the exceptional nature of the first three countries' trends. Cyprus was no exception, likely because it experienced the largest overall influx of migrants from Ukraine and Russia during the war (see Fig. 1).

The change in logistics performance in these countries was tracked through the dynamics of the Logistics Quality and Competence subindex (in the World Bank LPI) during the war (2023) and before the war (2018). In 8 out of 10 countries, the quality of logistics increased (see Tab. 3), which indicates a positive relationship between the migration in question and the growth of logistics quality.

Table 1

Final results of regression analysis, values of R

Country	Air transport of passengers	Air transport of goods	Rail transport of passengers	Goods transport by rail	Goods transport by road	Export	Import
Bulgaria	0,82	0,37	0,98	0,02	0,59	0,97	0,96
Cyprus	0,93	0,54	-	-	0,91	0,83	0,98
Germany	0,59	0,49	0,63	0,03	0,13	0,96	0,88
Estonia	0,86	0,7	0,93	1	0,95	0,45	0,28
Spain	0,95	0,68	0,9	0,28	0,1	1	0,98
Finland	0,02	1	0,01	0	0,1	0,86	0,99
Italy	0,38	0,99	0,27	0,57	0,8	0,38	0,63
Netherlands	0,15	0,49	0,48	0,57	0,39	0,57	0,72
Poland	1	0,99	0,99	0,99	0,84	1	0,95
Portugal	0,93	0,66	0,86	0,51	0,94	0,83	0,81

Table 2

The proportion of migrants from Ukraine and the Russian Federation to the country's population, %

Country	2018	2019	2020	2021	2022	2023	2024	2023/2022	2024/2023
Bulgaria	0,018	0,025	0,022	0,027	0,036	0,043	0,034	1,19	0,80
Cyprus	0,098	0,098	0,105	0,147	0,802	0,558	0,364	0,70	0,65
Germany	0,021	0,016	0,014	0,019	0,028	0,030	0,021	1,08	0,71
Estonia	0,196	0,239	0,225	0,255	0,381	0,414	0,176	1,09	0,43
Spain	0,021	0,022	0,023	0,029	0,034	0,036	0,035	1,08	0,97
Finland	0,053	0,067	0,074	0,093	0,141	0,107	0,085	0,75	0,80
Italy	0,013	0,015	0,008	0,022	0,039	0,023	0,009	0,59	0,39
Netherlands	0,018	0,021	0,017	0,022	0,044	0,033	0,022	0,76	0,65
Poland	0,162	0,179	0,134	0,142	0,281	0,302	0,314	1,07	1,04
Portugal	0,018	0,023	0,019	0,017	0,024	0,056	0,060	2,34	1,07

Germany and Portugal were exceptions. For Germany, this is explained by the high base effect (in 2018, Germany ranked first in this indicator), as well as the World Bank's transition to Big Data, which resulted in a decline in the scores of many developed countries. The latter factor apparently also impacted Portugal.

To determine which countries benefited most from migrants, the author compiled all indicators for which a correlation was found into a single results matrix (see Tab. 4). Indicators were assigned binary values: where a strong correlation was observed — 1; where there was no correlation — 0.

As a result, we can conclude that the greatest positive effect from migration from Ukraine and Russia during the war years was experienced by Bulgaria, Poland, Spain, and also Cyprus, and to a somewhat lesser extent, Portugal.

## 5. DISCUSSION AND CONCLUSIONS

This paper explores an original research problem concerning the impact of military migration on the development of transportation and logistics in EU countries that have received relocated migrants from warring countries. The experience of European countries after three years of the full-scale Russian-Ukrainian conflict was analyzed, as all data for four years had not yet been published.

Table 3

## Logistics Competence and Quality Score

Country	2018	2023	Dynamics
Bulgaria	2,88	3,3	0,42
Cyprus	3	3,2	0,20
Germany	4,31	4,2	- 0,11
Estonia	3,15	3,7	0,55
Spain	3,8	3,9	0,10
Finland	3,89	4,2	0,31
Italy	3,66	3,8	0,14
Netherlands	4,09	4,2	0,11
Poland	3,58	3,6	0,08
Portugal	3,71	3,6	- 0,11

Tab. 4

## Results matrix

Country	Air transport of passengers	Rail transport of passengers	Export	Import	Logistics	SUM
Bulgaria	1	1	1	1	1	5
Cyprus	1	-	1	1	1	4
Germany	0	0	1	1	0	2
Estonia	1	1	0	0	1	3
Spain	1	1	1	1	1	5
Finland	0	0	1	1	1	3
Italy	0	0	0	0	1	1
Netherlands	0	0	0	0	1	1
Poland	1	1	1	1	1	5
Portugal	1	1	1	1	0	4

As a result, the study's objective was achieved: identifying which European countries benefited most from migration from Ukraine and the Russian Federation. The research question was answered.

It turned out that transportation and logistics improved in countries that received large numbers of migrants and created favorable conditions for their resettlement. The greatest beneficiaries of these changes in transportation during political instability were Bulgaria, Poland, Spain, and Cyprus, and, to a lesser extent, Portugal. Subsequently, research will examine how willingly EU countries accept refugees from Ukraine and Russia, whether the conditions for starting a new business differ for migrants from other countries, and whether there is excessive bureaucracy and financial difficulties. For example, how have restrictions on Russians opening bank accounts in Europe affected transportation and logistics in these countries?

This study faced certain limitations, namely the lack of precise data on the number of migrants from countries affected by military conflict who arrived in Europe and remained there long-term. The number of residence permits issued for one year or more does not guarantee that recipients will remain in the host country.

This study, while not exhaustive, reveals certain trends and relationships. Identifying these is important for understanding emerging patterns in transportation and logistics in a context of political instability. Political shocks are likely to persist for many years to come.

## References

1. Bednarski, L. & Roscoe, S. & Blome, C. & Schleper, M.C. Geopolitical disruptions in global supply chains: a state-of-the-art literature review. *Production Planning & Control*. 2023. P. 1-27. DOI: 10.1080/09537287.2023.2286283.
2. Yang, C. & Chan, D.Y.-T. Geopolitical risks of strategic decoupling and recoupling in the mobile phone production shift from China to Vietnam: Evidence from the Sino-US trade war and COVID-19 pandemic. *Applied Geography*. 2023. Vol. 158. No. 103028. DOI: 10.1016/j.apgeog.2023.103028.
3. Dudnik, T. Kierunki rekonfiguracji międzynarodowych łańcuchów dostaw w kontekście globalnej niestabilności. *Management and Quality – Zarządzanie i Jakość*. 2024. Vol. 6. No. 2. P. 61-77. Available at: <https://zjz.edu.pl/wp-content/uploads/2024/06/Vol-6-No-2.pdf>. [In Polish: Directions of reconfiguration of international supply chains in the context of global instability].
4. Bathelt, H. & Li, P. The interplay between location and strategy in a turbulent age. *Global Strategy Journal*. 2022. Vol. 12. P. 451-471. DOI: 10.1002/gsj.1432.
5. Hess, M. & Horner, R. Driving change in troubling times: security, risk and the state in global production networks. *ZFW – Advances in Economic Geography*. 2024. Vol. 68. Nos. 3-4. P. 145-150. DOI: 10.1515/zfw-2024-0085.
6. Narkhede, G. & Samuel, C. & Mahajan, S. & Sakhare, N. & Chaudhari, T. Beyond traditional supply chain management: Addressing sociopolitical challenges in increasingly turbulent global trade landscape. *Business Strategy and Development*. 2024. Vol. 7(2). No. e397.
7. Kone, L. & Ruiz, I. & Vargas-Silva, C. Self-employment and reason for migration: are those who migrate for asylum different from other migrants? *Small Business Economics*. 2021. Vol. 56. No. 3. P. 947-962.
8. Kozhevnikova, M. & Lejman, M. Between the Individual and the Collective: Identity Dilemmas of Russian Migrants after the Russian Invasion of Ukraine. Sample Research in Poland and Germany. *Adeptus*. 2025. No. 22. DOI: 10.11649/a.3267.
9. Srari, J.S. & Graham, G. & Van Hoek, R. & Joglekar, N. & Lorentz, H. Impact pathways: unhooking supply chains from conflict zones—reconfiguration and fragmentation lessons from the Ukraine–Russia war. *International Journal of Operations & Production Management*. 2023. Vol. 43. No. 13. P. 289-301. DOI: 10.1108/IJOPM-08-2022-0529.
10. Błażek, J. & Lypianin, A. Military conflicts and the performance of state-owned enterprises: a study of Ukraine's aerospace, defense, and electro-engineering industries before and after the 2014 Crimea and Donbas occupation. *ZFW – Advances in Economic Geography*. 2024. Vol. 68. Nos. 3-4. P. 182-194. DOI: 10.1515/zfw-2024-0049.
11. Xue, D. & Du, S. & Xu, Y. et al. Airspace closure challenges: Exploring the impact of the Russia-Ukraine conflict on flight operations and pathways to solutions. *Transportation Research Interdisciplinary Perspectives*. 2025. Vol. 31. No. 101396.
12. Chu, C. & Zhang, H. & Zhang, J. et al. Assessing impacts of the Russia-Ukraine conflict on global air transportation: From the view of mass flight trajectories. *Journal of Air Transport Management*. 2024. Vol. 115. No. 102522. DOI: 10.1016/j.jairtraman.2023.102522.
13. Steinbach, S. The Russia–Ukraine war and global trade reallocations. *Economics Letters*. 2023. Vol. 226. No. 111075. DOI: 10.1016/j.econlet.2023.111075.
14. Duplan, T. & Espérandieu, M. *Les Conséquences du Conflit Russo-Ukrainien sur la Filière Transport et Logistique*. 2022. Available at: [https://www.cncccf.org/wp-content/uploads/2022/05/Note\\_TLI\\_RUSSUK.pdf](https://www.cncccf.org/wp-content/uploads/2022/05/Note_TLI_RUSSUK.pdf). [In French: Consequences of the Russia-Ukraine Conflict for the Transport and Logistics Sector].
15. Kóczán, Z. & Chupilkina, M. Trade, Deteriorating Terms of Trade and FDI. In: Mátyás, L. (ed.). *Central and Eastern European Economies and the War in Ukraine*. Contributions to Economics. Cham: Springer. 2024. DOI: 10.1007/978-3-031-61561-0\_7.
16. Popławski, K. *Unequal competition. The consequences of the liberalisation of EU–Ukraine road carriage for Central Europe*. 2024. Available at: <https://www.osw.waw.pl/en/publikacje/osw-commentary/2024-04-04/unequal-competition-consequences-liberalisation-eu-ukraine>.

17. Karaś, D. & Wielechowski, M.W. & Zajac, A.A. Financial performance of road freight transport companies bordering Ukraine in Central and Eastern Europe: The impact of the COVID-19 pandemic and the Russia–Ukraine war. *Transportation Research Interdisciplinary Perspectives*. 2025. Vol. 34. No. 101668. DOI: 10.1016/j.trip.2025.101668.
18. Kos-Labedowicz, J. & Talar, S. Trade Resilience of Central and Eastern European Countries to the Shock Caused by the Russia–Ukraine War. *Forum Scientiae Oeconomia*. 2024. Vol. 12. No. 4. P. 156-171. DOI: 10.23762/FSO\_VOL12\_NO4\_9.
19. Yeung, H.W.-C. Troubling economic geography: New directions in the post-pandemic world. *Transactions of the Institute of British Geographers*. 2023. Vol. 48. P. 672-680. DOI: 10.1111/tran.12633.
20. Padovan, M. & Cusimano, N. The future of international trade and the European economic security strategy. *Global Trade and Customs Journal*. 2025. Vol. 20. No. 2. P. 79-88. DOI: 10.54648/GTCJ2025010.
21. Nikiforenko, V. & Kuryliuk, Yu. Ukraine's transit potential amid the Russian invasion and European integration. *Lex Portus*. 2024. Vol. 10. No. 4. P. 7-19. DOI: 10.62821/lp10401.
22. Markus, S. Long-term business implications of Russia's war in Ukraine. *Asian Business & Management*. 2022. Vol. 21. P. 483-487. DOI: 10.1057/s41291-022-00181-7.
23. Atamanenko, A. & Avgustiuk, M. Forced migration from Ukraine during the Russian-Ukrainian war: Impact on the EU and Ukraine. *Nowa Polityka Wschodnia*. 2023. Vol. 38. No. 3. P. 38-59. DOI: 10.15804/npw20233802.
24. Maidanik, I. The forced migration from Ukraine after the full-scale Russian invasion: dynamics and decision-making drivers. *European Societies*. 2024. Vol. 26. No. 2. P. 469-480. DOI: 10.1080/14616696.2023.2268150.
25. Nikolaiets, K. & Shkuropadska, D. & Ozhelevskaya, T. et al. External migration in the conditions of the Russian-Ukrainian war. *Financial and Credit Activity: Problems of Theory and Practice*. 2023. Vol. 2. No. 49. P. 445-456. DOI: 10.55643/fcaptp.2.49.2023.4005.
26. Skowronek-Grądział, A. Ukraine's transport infrastructure in the face of war – the context of the financial challenges of reconstruction. *Scientific Papers of Silesian University of Technology. Organization and Management Series*. 2025. Vol. 227. P. 337-354. DOI: 10.29119/1641-3466.2025.227.26.
27. Si, R. & Wang, N. & Jia, P. et al. Unraveling structural shifts and resilience patterns of global and intercontinental crude oil maritime transportation networks under geopolitical conflicts: A multiplex network model. *Transportation Research Part E: Logistics and Transportation Review*. 2026. Vol. 206. No. 104550. DOI: 10.1016/j.tre.2025.104550.
28. Jia, H. & Wu, Z. The impact of Russia-Ukraine war on international maritime petroleum trade and tanker fleet productivity. *Journal of Transport Geography*. 2026. Vol. 131. No. 104543. DOI: 10.1016/j.jtrangeo.2025.104543.
29. Chen, J. & Fang, Q. & Li, C. et al. Impact of the Russia-Ukraine conflict on the resilience of global shipping supply chains. *Regional Studies in Marine Science*. 2025. Vol. 91. No. 104502. DOI: 10.1016/j.rsma.2025.104502.
30. Marzęda-Młynarska, K. & Kięczkowska, J. Alternative food transportation routes from Ukraine. *Transportation Research Procedia*. 2026. Vol. 93. P. 1062-1067. DOI: 10.1016/j.trpro.2025.12.043.
31. Sielker, F. & Dannenberg, P. New economic geographies of war: risks and disruptions in Eurasian transport routes and supply chains through the military conflict in Ukraine. *ZFW – Advances in Economic Geography*. 2025. DOI: 10.1515/zfw-2024-0059.
32. Sadłowski, A. & Kijek, A. & Zajac, A. Wpływ rosyjskiej inwazji na Ukrainę na polski sektor transportowy. *Ekonomista*. 2026. No. 1. P. 28-44. DOI: 10.52335/ekon/200606. [In Polish: Impact of the Russian invasion of Ukraine on the Polish transport sector].
33. Gopal, S. & Thangaraj, V. & Kumara, N.R. & Rupa, R. Geopolitical shockwaves: the Russia-Ukraine war's impact on BRICS financial markets. *Cogent Economics & Finance*. 2025. Vol. 13. No. 2476096. DOI: 10.1080/23322039.2025.2476096.

34. Fidanoğlu, A. & Değirmenci, B. Reflections of the Ukraine-Russia war on world trade and supply chain and examination of its effects on Turkey. In: *Strategic Innovations for Dynamic Supply Chains*. Hershey, PA: IGI Global. 2024. P. 275-300. DOI: 10.4018/979-8-3693-3575-8.ch012.
35. Ślusarczyk, B. & Kozłowska, M.A. & Brożek, K. Sustainable Development of Transport in the Context of Russia's Invasion of Ukraine. *Internal Security*. 2025. Vol. 17. No. 1. P. 181-203. DOI: 10.5604/01.3001.0055.4514.
36. Cohen, S. & Hannonen, O. A review of research into lifestyle mobilities and digital nomadism. *Annals of Tourism Research*. 2025. Vol. 116. No. 104067. DOI: 10.1016/j.annals.2025.104067.
37. Sharma, G.D. & Chopra, R. & Kraus, S. et al. Fostering refugees' entrepreneurial instincts: Lessons from the past, learning for the future. *European Management Review*. 2026. P. 1-20. DOI: 10.1111/emre.70062.
38. Ahmed, S.K. How to choose a sampling technique and determine sample size for research: A simplified guide for researchers. *Oral Oncology Reports*. 2024. Vol. 12. No. 100662. DOI: 10.1016/j.oor.2024.100662.
39. Eurostat. *Residence permits – statistics on first permits issued during the year*. 2025. Available at: [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Residence\\_permits\\_-\\_statistics\\_on\\_first\\_permits\\_issued\\_during\\_the\\_year](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Residence_permits_-_statistics_on_first_permits_issued_during_the_year).
40. DBnomics – the world's economic database. *First permits by reason, length of validity and citizenship*. Available at: [https://db.nomics.world/Eurostat/migr\\_resfirst](https://db.nomics.world/Eurostat/migr_resfirst).
41. Eurostat. *Population on 1 January*. 2026. Available at: [https://ec.europa.eu/eurostat/databrowser/view/tps00001/default/table?lang=en&category=t\\_demo\\_t\\_demo\\_pop](https://ec.europa.eu/eurostat/databrowser/view/tps00001/default/table?lang=en&category=t_demo_t_demo_pop).
42. Eurostat. *International trade, by reporting country, total product*. 2026. Available at: [https://ec.europa.eu/eurostat/databrowser/view/tet00002/default/table?lang=en&category=t\\_ext\\_go\\_lti.t\\_ext\\_go\\_lti\\_int](https://ec.europa.eu/eurostat/databrowser/view/tet00002/default/table?lang=en&category=t_ext_go_lti.t_ext_go_lti_int).
43. World Bank. *Logistics Performance Index*. 2026. Available at: <https://data.worldbank.org/indicator/LP.LPI.OVRL.XQ>.