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LONG-TERM DETERMINANTS OF ECONOMIC DEVELOPMENT: THE IMPACT OF MIGRATION FLOWS ON THE ECONOMY OF UKRAINE

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ABSTRACT

The article examines the present issues with Ukraine's long-term economic development in light of migratory movements following the end of the war. The authors point out that factors like economic expansion, which would provide jobs for them and draw in foreign capital, digitization of the economy, increased use of ICT and digital technologies, and improvements in population welfare could be the main causes of the return of refugees following the conclusion of the war. The authors came to the conclusion that while the mass return of refugees may, in the short term, result in overcrowding and a rise in the unemployment rate, which will have a negative impact on GDP, it may also, in the long run, lead to the emergence of new industries or the revitalization of declining regions, both of which will have a positive impact on GDP growth. Programs for the repatriation of refugees should be established by the state to support such a positive trend. Reconstruction after a war can involve refugees, who will boost the economy. In light of this, public-private partnerships are crucial for Ukraine as they foster effective communication among its constituents and guarantee the promptness and dependability of efforts to rebuild the nation's economy, particularly in times of crisis and during the post-war era. A significant quantity of debt, which is created during times of war, bolsters the downward trend. It can also result in a decline in GDP because of the destruction of some industries, limited production capacity, and a reduction in economic efficiency.

The study shows how the return of migrants will affect the level of employment, supply and demand in the labour market. The essay constructs a model of the economic growth of Ukraine and looks at the variables that affect GDP the most in light of the war-related migration surge.

Keywords: migration flows, refugees, economic development, GDP, sustainable development, public-private partnership, post-war recovery, foreign debt

JEL Classification: J61, O11

INTRODUCTION

The relevance of the study of long-term determinants of economic development in the context of the impact of migration on the economy of Ukraine is due to global factors that affect modern society and the near future. With the start of the full-scale invasion, Ukraine faced geopolitical and economic challenges. Understanding the impact of migration flows on the economy becomes important in the context of overcoming these challenges and increasing the sustainable development of the economy. In addition, migration flows affect not only the economy but also the social sphere, culture and other aspects of public life. Analyzing and understanding this impact will help to develop policies aimed at supporting the social integration and development of migrants. During the war, migration flows change dynamically, their change also affects the economic development of Ukraine. Understanding these changes is important for the adaptation of economic policies and for the development of effective development strategies.

At the same time, as globalization advances and takes into consideration de-globalization tendencies, technical advancements, and other economic considerations, it pre-

sents opportunities as well as obstacles, particularly for the Ukrainian economy. Analyzing the effects of migratory patterns will aid in determining potential strategies for boosting competitiveness and long-term economic expansion.

LITERATURE REVIEW

Many Ukrainian scientists began to study migration processes during the war, among which we can highlight the works of O. Lytvynchuk and O. Yurkivskyi [15], A. Simakhova [24], which reveal the positive and negative sides of migration for Ukraine. The authors analyze the number of registered refugees in certain European countries, in particular Poland, and reveal the importance of efforts by the state to return refugees to Ukraine in the future. Lytvynchuk O. and Yurkivskyi O. in their research reveal the perspective of the dynamics of migration as a complex, multifaceted phenomenon, and analyze the features of the successful policy of re-emigration of Ukrainian refugees. In the article by Fedun I., Kydirko L. and others. [10] at the theoretical and experimental level, the foundations of the main problems of international labour migration were identified, and their main sectoral priorities in Ukraine were revealed. The authors researched the influence of internal and external factors on labour migration in Ukraine and proved that political, economic and social factors are the driving force of migration processes, and the most widespread force of influence are factors of a socio-economic nature. Chernenko N. [3] examines possible ways of solving migration problems after the end of the war. In his work, he accentuates the provision of jobs for returning refugees, which, in his opinion, is possible due to digitalization, the development of digital transformations that will stimulate the development of the information society, contribute to the increase of labour productivity in the country, economic growth and the well-being of the population. Malinovska O. [16; 17] came to the conclusion that Ukrainian refugees will be less willing to stay abroad and more actively return to Ukraine if they are sure that, if necessary, they will be able to go abroad again. In her work, the author focuses on a new vision of the migration segment of security ("hard" and "soft" security threats). Emigration as a challenge to economic security is also considered by the team of authors of the Razumkov Center [27]. Bondar T. and Ganyukov O. [2] in their study analyze the migration stages before and after the full-scale invasion, identify their main causes, provide recommendations for improving the situation of migrants, and emphasize the need to develop a new migration policy for the purpose of returning refugees. Kuryliuk Y. [12] reveals the problems of migration processes as a result of the war in Ukraine and focuses more attention on border points, border control, and the very process of refugees crossing the border of Ukraine.

This issue – the return or non-return of refugees - began to be discussed a few months after the beginning of the full-scale invasion of the Russian Federation into Ukraine, when the migration flow reached large volumes. All Ukrainian researchers focus in their works on the need to return refugees and reveal possible ways of their return, which is an acute issue for the economy of Ukraine; and agree that the main drivers of the return of refugees after the end of the war can be economic growth, which will provide them with jobs, attracting foreign investments (Marshall's plan for Ukraine, etc.), digitalization of the economy, the use of ICT, digital technologies, and the increase in the welfare of the population.

Many studies have been conducted by Ukrainian research institutes and their specialists, such as the National Institute of Strategic Studies in the analytical report "The impact of migration on the socio-economic situation in Ukraine", where particular attention is paid to the return of migrants and their integration in the post-war period [26]; the Center for Economic Strategy, where the authors considered clusters of refugees and the possibility of their return [23]; the Razumkov Center, which reveals the impact of migration processes on the course of post-war recovery of Ukraine, migration challenges for the country's economy [27]; State Employment Service, Federation of Employers of Ukraine, [13]; etc.

This issue is relevant for foreign scientists, especially from those countries where refugees are observed the most. Thus, Polish scientists Maciej Duszczyk and Pawel Kaczmarczyk [5] investigate the relationship between immigrants from Ukraine and possible challenges for the Polish economy. We fully agree with the authors that Poland plays an important role among the countries that receive refugees, of which Poland has the largest number. This is due not only to a geographical factor but also to an ancient tradition - labour migration between Ukraine and Poland. In their research, the authors tried to assess the impact of such a large number of Ukrainian migrants on Poland's economy and identify possible problems.

Ukrainian refugees generally have a positive effect on Poland's economy, as noted in many foreign and domestic studies. Thus, according to research by the EWL group (the largest employment company in the European Union), the contribution of Ukrainian refugees to the Polish economy in 2023 was approximately 1% of GDP [33]. According to the latest research by Deloitte (an auditing and consulting company) commissioned by the UN, Ukrainian refugees (from the war) made a significant contribution to the Polish economy, the share in Poland's GDP in 2023 was 0.7-1.1% [21]. According to research by the National Bank of Poland and the Main Trade School, the influence of Ukrainian migrants who arrived before the war in 2013-2018 even reached 13% of GDP growth. In general, in the period 2014-2018, the work of Ukrainian migrants

contributed to the growth of Polish GDP by approximately 11% [14]. According to various studies, the data do not fluctuate significantly.

Polish scientists Agnieszka Pikulicka-Wilczewska & Greta Uehling [1], in their work, reveal migration processes occurring within Ukraine or associated with the migration of Ukrainian citizens outside the country since the Russian annexation of Crimea in 2014. These processes, in their opinion, can change the social landscape of the region for many years to come.

Elspeth Guild and Kees Groenendijk explored the challenges of migration for European countries; the study "Immigration of Ukrainians 2023: Impact of Ukraine-Russia war" [7 reveals not only the refugee crisis but also global security and global development. This topic attracts the attention of the EC, OECD and many other international and European institutions.

This problem has also been widely raised in media publications.

AIMS AND OBJECTIVES

The article's aim is to investigate the long-term effects of migrant movements brought on by the war on the Ukrainian economy.

The main tasks, based on the stated aim, are as follows:

- analyze the effects of the migration crisis on Ukraine and the nations that have taken in the greatest number of Ukrainian refugees;
- evaluate the possibility and risks of refugee returns following the end of the war;
- analyze the challenges that Ukraine will face going forward in the process of restoring its infrastructure and fostering economic growth in general.

METHODS

The impact of migration on economic development is a topic of growing interest, as policymakers and academics seek to understand how migration can contribute to or hinder economic growth. Migration processes associated with a full-scale invasion deepen the demographic situation in Ukraine and raise questions about the future economic development of the state.

The destruction of infrastructural facilities, and migration - all of this has an impact on economic development and necessitates the establishment of post-war rebuilding strategies. Investigating such migration from Ukraine becomes an intriguing aspect of determining the impact that Ukrainian migrants have on the economies of recipient countries, the impact migration has on recipient countries' economic activity, the impact migrants have on public finances, the state of the labour market, and long-term economic development Ukraine.

The experience of many migration flows gives reason to assume that the return of refugees to their homeland will depend on the duration of the war, the developed state programs and instruments, and the prospects for economic growth.

Most of the scientific works are devoted to the analysis of refugees, their situation in other countries, the positive and negative aspects of migration processes for Ukraine and for recipient countries ((mainly European countries, the economy of Germany, Poland), possible ways, state programs for the return of Ukrainian refugees to their homeland.

According to UN statistics (April 2024), 6 471 600 refugees from Ukraine were recorded worldwide: 5 930,4 thousand refugees were recorded in Europe and 541.2 thousand refugees were recorded outside Europe [4].

In its study, the Center for Economic Strategy estimated that the total number of Ukrainian refugees (who left or were deported) is 6.8 million people (as of mid-2023); such a number of refugees was provoked by the war in Ukraine [23]. The data from the UN Refugee Agency shows a Total number of Ukraine people who are protected and/or assisted by UNHCR in the mid-year trends – 6 748 413 [28].

In general, data on the official number of registered refugees may be inaccurate. This is due to the fact that some Ukrainians who left at the beginning of the war have already returned home, left for other countries, or left through the territory of Russia or Belarus (some of them lived in the territories of these neighbouring states for a long time).

The Center for Economic Information predicted its calculations – from 1.3 million to 3.3 million Ukrainians may remain abroad, depending on various scenarios of the development of events in Ukraine; their failure to return will have a significant impact on the domestic economy, which could lose between 2.7% and 6.9% of its GDP each year [23, P.6]. The

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number of Ukrainians who do not intend to return is growing every day. This is a consequence of the increase in the duration of the war and the adaptation of Ukrainian refugees to living conditions abroad. That is why the process of increasing the number of non-returning refugees is taking place.

In addition to the migration wave that was observed in 2022, the country's GDP decreased by more than 30%, the national currency significantly depreciated, prices increased and the income level of the population has fallen greatly [13, P.12]. The decrease in GDP, as a rule, occurred at the expense of significant worsening macro indicators in war conditions (destruction of infrastructure, disruption of logistics, reduction of exports, annexation of territories). The world experience of wars shows that, as a rule, 30-40% of migrants return.

Data Federal Office for Migration and Refugees shows that at the beginning of 2023, almost half of the respondents intend to stay in Germany in the longer term [30]. Every year this figure will grow.

In this study, we propose to use the principle of a systemic approach to reveal the impact of war-related migration flows of Ukraine on GDP and economic growth. By applying this principle, you can get a deeper understanding of how migration flows interact with the economic system, understand the dynamic interactions and feedback loops between migration flows and other components of the economic system (how the return of migrants will affect the level of employment and wages, demand and supply in the market).

It should be noted, that the effects of migrant returns may not conform to simple causal relationships, but may involve multiple feedback mechanisms, delays, and unpredictable properties. In the short term, the return of refugees can lead to both an increase in the unemployment rate and the emergence of new industries or the revitalization of declining regions, which will ultimately affect GDP growth. Therefore, this issue requires constant monitoring and analysis, every year the continuation of the war can lead to different scenarios of the impact of migration processes on the economy of Ukraine.

The study of the impact of migration flows on the GDP of Ukraine requires a thorough approach, taking into account the analysis of how various economic and social factors:

1. This analysis collected official statistics on the number of refugees from Ukraine, the average population in Ukraine, GDP, the level of public debt in Ukraine, the attraction of FDI, and the level of inflation.
2. Analyzed effects of migration crisis (positive and negative factors), both for Ukraine and recipient countries.
3. The collected statistical data cover the fifteen-year period 2009-2023.
4. The analyzed statistics regarding internally displaced persons (IDPs).
5. Developed a model regarding the impact of refugee return on Ukraine's GDP growth.
6. The factors are revealed that will determine the possibilities of the refugees' return.

This approach will provide a deeper understanding of how migration flows shape the economic landscape of Ukraine, and form policy, based on actual data, to harness the potential benefits of migration for sustainable economic development.

Based on the analysis of collected statistical data, the study of economic and social factors of the impact of migration flows on GDP, economic growth of Ukraine and the use of the econometric program E-Views, a multivariate regression model was developed, which has the form:

$$Y = f(X_1 \ldots X_n), \quad (1)$$

The use of the program E-Views is due to the possibility of building an econometric model, forecasting and conclusions regarding the influence of factors on the country's GDP. In the process of developing the model, factors were checked, which have the greatest impact on GDP in the context of a war-related migration wave. Thus, the choice of the specified E-Views program is adequate and rational according to the possibilities that are set in accordance with the tasks of this study.

The authors propose to consider the impact of population and state debt on GDP in accordance with the goal set in this article (positive or negative). So, we have a function:

$$GDP = f(P, SD) \quad (2)$$

where, GDP – Nominal gross domestic product, USD million; P – Population, million people; SD – External debt, %.

To select these factors, the principle of information availability was used - the use of official data of the Ministry of Finance of Ukraine, the National Bank of Ukraine and the United Nations Office for Refugees; and the representative principle, which states that each variable chosen for the sample is the most significant and justified.

RESULTS

Ukrainian refugees

The number of Ukrainian refugees increased significantly after the full-scale Russian invasion of Ukraine. According to the Center for Economic Information, refugees from Ukraine are divided into four clusters (Figure 1).

The first cluster is mainly women with children, located in the territories of European countries.

The second cluster consists of people who are more adapted to life abroad, mostly know the language, and are more inclined to work abroad.

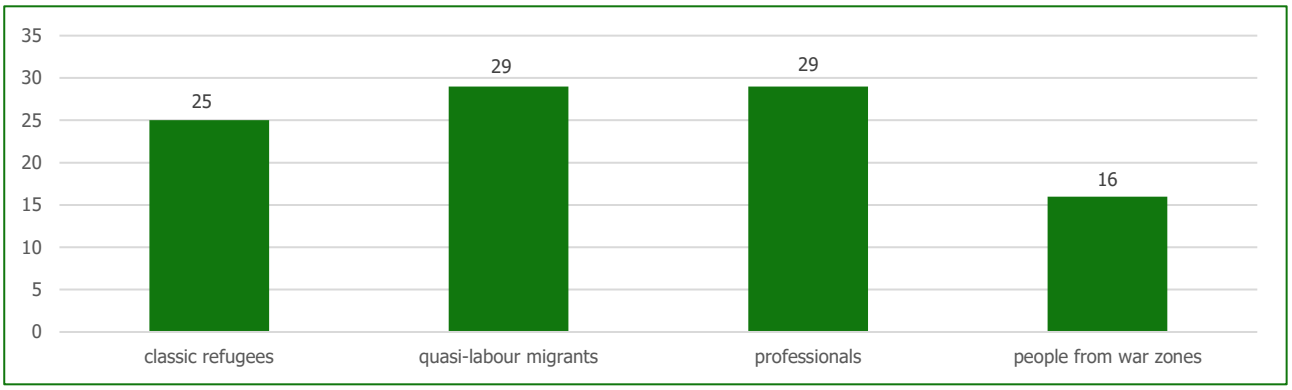

Figure. 1. Clusters of refugees from Ukraine, %. *(Source: [23, p.41])*

The third cluster is refugee professionals, specialists in their field, working abroad in a speciality or related specialities.

The fourth cluster is refugees from war zones, most often not adapted to life abroad, but taking all possible steps to adapt.

Table 1 shows official data on refugees by European countries. It should be noted that in 2022, the majority of refugees were women – 85% and most of them were productive age groups (35-59 years - 47%, 18-34 years - 25%) [13, P.22]. The challenge is the outflow of children and young people abroad, who quickly adapt to new conditions; the majority of school graduates remained abroad in 2022-2023.

Table 1. Statistical data of refugees by European countries. *(Source: [4])*

Country	data	Refugees from Ukraine recorded in the country as of date	Refugees from Ukraine who applied for Asylum, TP or similar national protection schemes to date
Austria	01.04.2024	73585	112 045
Belgium	31.03.2024	78580	83 085
Bulgaria	08.03.2024	72775	172 290
Greece	31.12.2023	27365	27 850
Denmark	01.04.2024	38025	50 985
Estonia	31.03.2024	36250	58 725
Ireland	16.04.2024	106355	106 355
Spain	31.03.2024	192380	203 455
Italy	15.03.2024	172495	192 760
Cyprus	07.04.2024	18740	21 705
Latvia	18.04.2024	48090	54 420

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Table 1. Continued.

Country	data	Refugees from Ukraine recorded in the country as of date	Refugees from Ukraine who applied for Asylum, TP or similar national protection schemes to date
Lithuania	02.04.2024	41075	85 150
Luxembourg	29.02.2024	4260	6 470
Malta	29.02.2024	2435	2 710
Netherland	31.03.2024	122535	148 640
Germany	31.03.2024	1152640	1 072 035
Poland	15.12.2023	956635	1 640 510
Portugal	29.02.2024	60215	37 275
Romania	21.04.2024	77900	161 370
Slovakia	14.04.2024	118960	142 840
Slovenia	03.04.2024	11240	10 875
Hungary	21.04.2024	58995	42 505
Finland	29.02.2024	66195	67 455
France	29.02.2024	68780	104 070
Croatia	31.03.2024	24850	25 970
Czech Republic	01.04.2024	339305	599 353
Sweden	27.03.2024	41670	66 885
Total EU		**4012330**	**5 297 778**
Other European countries		662690	251 935
Total		**4675020**	**5 549 713**

Analyzing Table 1, we see that Poland accepted more than 1.6 million refugees, Germany – about 1.1 million, and the Czech Republic – about 600 000; these are the European countries that accepted the largest number of Ukrainian refugees. 2024 – the war continues, and in case of a repeated attack by the Russian Federation and the situation worsens, the number of refugees will increase.

The consequences of the migration crisis for both Ukraine and the EU are not fully determined. Simultaneously, European countries have concerns regarding the financial burden on the budgets of countries, the threat to the security and well-being of European countries, as well as the threat of social, political and economic problems (which periodically already occur in European countries) [15, P.75]. However, there are positive factors: Ukrainian refugees contributed to the revival of the economy, particularly in Poland and the Baltic countries; Ukrainian refugees filled the labour shortage in Poland and the Netherlands.

The negative aspects of migration processes in Ukraine as a result of the war are caused by the demographic crisis and the loss of intellectual potential, on which the director of the Institute of Demography E. Libanova focuses his attention, as well as taking business abroad (especially small), growing inflation during the war, economic recession, and mobilization processes that have a direct impact on GDP. However, for Ukraine, among the positive aspects, Ukrainian scientists attribute the reduction of pressure on the economy and the state budget of Ukraine due to the departure of a significant number of the population abroad; preserving the lives of youth and children who left Ukraine in the war; reducing pressure on the labour market of Ukraine; improving the qualifications of migrants who, after victory, will partially return to Ukraine with new knowledge and skills; the growth of Ukraine's GDP as a result of remittances from migrants, which is relevant in wartime conditions; increasing the level of well-being and the possibility of providing for migrant families through remittances" [24, P.62–63].

In addition, some refugees left for other countries (Table 2).

Table 2. Other countries neighbouring Ukraine. *(Source: [4])*

Country	data	Refugees from Ukraine recorded in the country as of the date	Refugees from Ukraine who applied for Asylum, TP or similar national protection schemes to date
Russian Federation	31.12.2023	1212585	14970
Belarus	29.02.2024	42785	3695
Total		**1255370**	**18665**

We draw attention to the fact that Ukrainian refugees who are already working abroad mostly make remittances to their families in Ukraine. According to the NBU and the Ministry of Finance of Ukraine, remittances from wage-earners amounted to [19]:

- in 2019 about USD 11.9 billion;
- in 2020 nearly USD 12 billion;
- in 2021 about USD 14 billion;
- in 2020 nearly USD 13 billion;
- about USD 11.6 billion in 2023.

According to NBU forecasts, the amount of remittances to Ukraine in 2024 will amount to about USD 12.6 billion, and in 2025, the NBU expects an even greater increase in remittances.

At the same time except for external migration processes from Ukraine, internal migration processes are relevant to the phenomenon of internally displaced persons. Table 3 shows data on internally displaced persons.

Social factors—like social cohesion, cultural integration, and demographic shifts brought on by migration—are crucial for internally displaced people. These variables can influence consumption trends, investment decisions (choices), and the overall economic development of the region to which individuals have been relocated.

Table 3. Internally Displaced Persons (IDPs) by Oblast (27.12.2023). *(Source: [4])*

Oblast	%	IDPs	Oblast	%	IDPs
Dnipropetrovsk	12.8	474 000	Khmelnytskyi	2.7	98 000
Kharkiv	12.2	451 000	Ivano-Frankivsk	2.5	93 000
Kyiv city	9.9	364 000	Donetsk	2.5	92 000
Kyiv	8.8	326 000	Kirovohrad	2.2	82 000
Zaporizhzhia	6.1	226 000	Zhytomyr	2.0	75 000
Odesa	5.1	188 000	Zakarpattia	1.8	67 000
Lviv	4.7	173 000	Ternopil	1.6	58 000
Poltava	4.6	171 000	Chernihiv	1.5	57 000
Mykolaiv	3.8	141 000	Kherson	1.5	55 000
Vinnytsia	3.5	128 000	Chernivtsi	1.4	53 000
Sumy	3.1	116 000	Volyn	1.3	47 000
Cherkasy	3.0	110 000	Rivne	0.7	27 000
Other	0.5+0.2	17 000			
Total	**100**	**3 689 000**			

Econometric modelling of the effect of migration on GDP: testing for autocorrelation, heteroscedasticity

Forming an econometric model of the influence of migration flows on GDP, we checked the following factors: the average population in Ukraine, the level of public debt in Ukraine, the attraction of FDI, and the inflation rate. Taking into account the level of significance of the tested selected factors, a regression equation was constructed:

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$$GDP = C(1) * P + C(2) * SD + \varepsilon \quad (3)$$

Where C (1, 2, ..., n) – the regression coefficients for the selected variables, ε – a measure of the dispersion of the values of a random variable relative to the mean value of the distribution.

Statistical data for building the model, which were accepted for calculation, are given in Table 4.

Table 4. Database for the model. *(Source: [19])*

Obs	GDP, USD million	P, USD million	USD, % to GDP
2009	117228	46.1	34.7
2010	136419	45.9	39.9
2011	163160	45.7	35.9
2012	175781	45.6	36.6
2013	183310	45.5	40.1
2014	131805	43.0	70.2
2015	90615	42.8	79.4
2016	93270	42.6	81
2017	112154	42.5	71.8
2018	130832	42.3	60.9
2019	153781	42.0	50.3
2020	155582	41.7	60.8
2021	199770	41.4	48.9
2022	160500	35.9*	78.4
2023	178775,6*	34.9*	84.4

The results of the regression analysis are given in Table 5; it provides an opportunity to assess the impact of selected variables on Ukraine's GDP using data for the period 2009-2023.

Table 5. The Results of Multi-Factor Regression of GFSI (Method Least Squares). *(Source: authors development by the Multiple Regression procedure in eViews)*

Dependent Variable: GDP				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
P	-11083.80	2323.516	-4.770272	0.0005
SD	-2205.053	423.3536	-5.208537	0.0002
C	745267.6	118499.5	6.289203	0.0000
R-squared	0.706287	Mean dependent var		145532.2
Adjusted R-squared	0.657335	S.D. dependent var		32996.65
S.E. of regression	19315.45	Akaike info criterion		22.75205
Sum squared resid	4.48E+09	Schwarz criterion		22.89366
Log likelihood	-167.6404	Hannan-Quinn criter.		22.75055
F-statistic	14.42810	Durbin-Watson stat		1.017468
Prob(F-statistic)	0.000642			

We check the significance of the constructed regression model.

1. So, as Prob. (F-statistic) = 0.000642, there are still less than 0.05 and 0.01 levels of significance, so this means the significance of the regression in general and confirms the alternative hypothesis, which indicates the significance of the equation as a whole. The results of multifactor regression showed that the constant is statistically significant (its value is less than 1%); in addition, usually strict requirements are not applied to the constant. This means that all selected indicators are statistically significant.
2. We check the coefficients. In our equation, all coefficients have Prob. less than 0.01 and 0.05 significance level. This means that all variables are significant.
3. R-squared = 0.706287, which means that in 70.6% of cases changes in X lead to changes in Y (GDP), i.e., the model is of proper quality and is adequate/
4. Let's analyze the value of the Durbin-Watson test (DW), which shows the presence or absence of autocorrelation of the first order. The DW criterion is analyzed by zones: zone with no autocorrelation, zone with positive autocorrelation, zone with negative autocorrelation and critical zone (zone of uncertainty); this criterion has limits from 0 to 4. According to the data in Table 5, DW = 1.017. The critical points of this d_L and d_U criteria were determined using Durbin-Watson statistics. We have 2 variables and 15 observations (from 2009 to 2023), which have the following meanings: if the level of significance α=5%, 0.946 < DW < 1.543; if the level of significance α=1%, 0.700 < DW < 1.232.

   The DW statistic is used to detect the presence of autocorrelation in the residuals of a regression model. Usually, if the DW is in the range of 0 to 2, it means that there is no serious autocorrelation. However, in the case of multiple regression, the limit of 2 can be lowered. Our result is DW = 1.017, which is close to 2. The results made it possible to make an assumption that the autocorrelation in the residuals of the model is either absent or small.

   We check the model for the presence of higher (second) order autocorrelation using the Breusch-Godfrey test (Table 6). Testing second-order autocorrelation is reduced to testing the null hypothesis. The Breusch-Godfrey Serial Correlation LM Test is aimed at detecting autocorrelation in the residual terms of the regression model. That is, we check once again whether the null hypothesis is accepted or rejected. Prob. F (2,10) = 47.97% and Prob. Chi-Square(2) = 35.89%, which is greater than the 5-10% significance level. This test showed that the null hypothesis (H_0.) can be accepted since there is no autocorrelation of the second (higher) order.
5. When building a model, it is customary to analyze information criteria such as Akaike (AIC) and Schwarz (BIC). Table results. 5 showed that their small value of the given criteria Akaike (AIC) = 22.75 and Schwarz (BIC) = 22.89 are acceptable for our model.

Table 6. Breusch-Godfrey Serial Correlation LM Test (Method Least Squares). *(Source: authors development by the Multiple Regression procedure in eViews)*

F-statistic	0.791200	Prob. F(2,10)		0.4797
Obs*R-squared	2.049317	Prob. Chi-Square(2)		0.3589
Test Equation: Dependent Variable: RESID				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
P	140.6052	2471.390	0.056893	0.9558
SD	104.2058	580.1845	0.179608	0.8610
C	-11744.36	131710.8	-0.089168	0.9307
RESID(-1)	0.371874	0.314645	1.181883	0.2646
RESID(-2)	-0.283020	0.446059	-0.634490	0.5400
R-squared	0.136621	Mean dependent var		-8.19E-12
Adjusted R-squared	-0.208730	S.D. dependent var		17882.63
S.E. of regression	19660.57	Akaike info criterion		22.87182
Sum squared resid	3.87E+09	Schwarz criterion		23.10784
Log likelihood	-166.5386	Hannan-Quinn criter.		22.86931
F-statistic	0.395600	Durbin-Watson stat		1.600344
Prob(F-statistic)	0.807455			

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The constructed correlation matrix of the variables indicates an inverse relationship for changes in Ukraine's GDP (Table 7).

Table 7. Correlation matrix of selected variables. *(Source: authors development by the Multiple Regression procedure in eViews)*

	GDP	P	SD
GDP	1	-0.2056	-0.3864
P	-0.2056	1	-0.7485
SD	-0.3864	-0.7485	1

The next step in model validation is testing for heteroscedasticity, which allows you to evaluate other members of the model for uneven variance, i.e., whether the error variance changes in relation to the independent variable values. Heteroskedasticity can impair the efficiency and consistency of model parameter estimates.

We conduct this check based on White's tests (Table 8), Breusch-Pagan-Godfrey (Table 9), Glejser (Table 10), ARCH (Table 11).

Table 8. White Heteroskedasticity Test (Method Least Squares). *(Source: authors development by the Multiple Regression procedure in eViews)*

F-statistic	0.886917	Prob. F(5,9)		0.5276
Obs*R-squared	4.951310	Prob. Chi-Square(5)		0.4219
Scaled explained SS	3.298645	Prob. Chi-Square(5)		0.6540
Test Equation: Dependent Variable: RESID^2				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	8.08E+10	2.15E+11	0.376033	0.7156
P	-3.33E+09	8.98E+09	-0.370977	0.7192
P^2	34737225	92690344	0.374766	0.7165
P*SD	7491543.	21884356	0.342324	0.7400
SD	-3.70E+08	9.80E+08	-0.377462	0.7146
SD^2	326819.3	1187333.	0.275255	0.7893
R-squared	0.330087	Mean dependent var		2.98E+08
Adjusted R-squared	-0.042086	S.D. dependent var		4.46E+08
S.E. of regression	4.55E+08	Akaike info criterion		42.99892
Sum squared resid	1.86E+18	Schwarz criterion		43.28214
Log likelihood	-316.4919	Hannan-Quinn criter.		42.99590
F-statistic	0.886917	Durbin-Watson stat		1.528840
Prob(F-statistic)	0.527628			

Table 9. Breusch-Pagan-Godfrey Heteroskedasticity Test (Method Least Squares). *(Source: authors development by the Multiple Regression procedure in eViews)*

F-statistic	2.334620	Prob. F(2,12)		0.1392
Obs*R-squared	4.201667	Prob. Chi-Square(2)		0.1224
Scaled explained SS	2.799220	Prob. Chi-Square(2)		0.2467
Test Equation: Dependent Variable: RESID^2				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	1.29E+09	2.51E+09	0.514586	0.6162
P	-4856025.	49142918	-0.098814	0.9229
SD	-13478589	8954031.	-1.505310	0.1581
R-squared	0.280111	Mean dependent var		2.98E+08
Adjusted R-squared	0.160130	S.D. dependent var		4.46E+08
S.E. of regression	4.09E+08	Akaike info criterion		42.67087
Sum squared resid	2.00E+18	Schwarz criterion		42.81248
Log likelihood	-317.0315	Hannan-Quinn criter.		42.66936
F-statistic	2.334620	Durbin-Watson stat		1.421797
Prob(F-statistic)	0.139185			

Table 10. Glejser Heteroskedasticity Test (Method Least Squares). *(Source: authors development by the Multiple Regression procedure in eViews)*

F-statistic	3.176739	Prob. F(2,12)		0.0781
Obs*R-squared	5.192595	Prob. Chi-Square(2)		0.0745
Scaled explained SS	4.186640	Prob. Chi-Square(2)		0.1233
Test Equation: Dependent Variable: ARESID				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	68772.49	57986.15	1.186016	0.2586
P	-702.9521	1136.981	-0.618262	0.5480
SD	-431.5473	207.1624	-2.083135	0.0593
R-squared	0.346173	Mean dependent var		13753.59
Adjusted R-squared	0.237202	S.D. dependent var		10822.00
S.E. of regression	9451.757	Akaike info criterion		21.32265
Sum squared resid	1.07E+09	Schwarz criterion		21.46426
Log likelihood	-156.9198	Hannan-Quinn criter.		21.32114
F-statistic	3.176739	Durbin-Watson stat		1.365536
Prob(F-statistic)	0.078123			

Table 11. ARCH Heteroskedasticity Test (Method Least Squares). *(Source: authors development by the Multiple Regression procedure in eViews)*

F-statistic	0.035223	Prob. F(1,12)		0.8543
Obs*R-squared	0.040973	Prob. Chi-Square(1)		0.8396
Test Equation: Dependent Variable: RESID^2				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	1.93E+08	86939929	2.216951	0.0467
RESID^2(-1)	0.030091	0.160331	0.187678	0.8543
R-squared	0.002927	Mean dependent var		2.02E+08
Adjusted R-squared	-0.080163	S.D. dependent var		2.54E+08
S.E. of regression	2.64E+08	Akaike info criterion		41.75234
Sum squared resid	8.36E+17	Schwarz criterion		41.84364
Log likelihood	-290.2664	Hannan-Quinn criter.		41.74389
F-statistic	0.035223	Durbin-Watson stat		1.591077
Prob(F-statistic)	0.854265			

All Probs obtained during Heteroskedasticity tests are greater than 5%, so it is possible to accept H0:

- test White Prob. F (5, 9) = 52.7%;
- test Breusch-Pagan-Godfrey Prob. F (2, 12) =13.9;
- test Glejser Prob. F (2, 12) =7.8;
- test ARCH Prob. F (1, 12) =85.4.

Econometric modelling of the impact of migration on GDP: descriptive statistics and forecasting

The next step is to analyze the descriptive statistics of the built model (Table 12).

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Table 12. Descriptive statistics of the model. *(Source: authors development by the Multiple Regression procedure in eViews)*

	GDP	P	SD
Mean	145532.2	42.52667	58.22000
Median	153781.0	42.60000	60.80000
Maximum	199770.0	46.10000	84.40000
Minimum	90615.00	34.90000	34.70000
Std. Dev.	32996.65	3.350579	18.38917
Skewness	-0.177935	-1.111248	0.048789
Kurtosis	2.029649	3.567580	1.449216
Jarque-Bera	0.667640	3.288525	1.509034
Probability	0.716183	0.193155	0.470238
Sum	2182983.	637.9000	873.3000
Sum Sq. Dev.	1.52E+10	157.1693	4734.264

In general, descriptive statistics show the normality and adequacy of the built model.

In the model, the Skewness indicator indicates the asymmetry of the distribution of the residuals of the regression model. The Skewness value indicates how much the distribution deviates from the normal distribution. The value of Skewness = -0.177935 means a slight left skew of the distribution of the residuals of the regression model, and therefore, as a whole, such a distribution is considered quite symmetrical.

Kurtosis is greater than 0, which means a sharply peaked distribution, the value is not large, which means that the distribution is close to normal.

To check for a normal distribution of residuals of the regression model in Table 12, the Jarque-Bera indicator is used. The residuals will have a symmetrical and normal distribution if the value of the Jarque-Bera indicator approaches zero. In our study, Jarque-Bera = 0.667640, which means that the residuals of your regression model are fairly close to a normal distribution.

The analysis of the data in Table 12 showed a high probability of accepting the null hypothesis - 71.6% (which is more than 5% significance level), and confirms the normal distribution.

The next step of checking the built model is the explanatory power, i.e., to what extent the selected factors resulting from changes in the studied variables reflect the possibility of GDP growth (Figure 2). The simulated values quite accurately correspond to all the necessary criteria of the built model, and mean its full acceptability.

We observe in Figure 3 the fall in GDP after the beginning of the Russian invasion in 2014, and the beginning of the fall after the full-scale invasion. Classically, attention is paid to MARE = 9.43, the average deviation of the actual number from the calculated one. It is accepted that a good forecast quality is from 0 to 10; acceptable forecast quality, high model quality - 10-20; and up to 30 - you can generally work with the built model. The lower the value, the better, because MAPE implies great forecast accuracy.

The next stage of forecasting involves the transition to trend analysis, which reflects the development trends of the national economy (based on the use of MS Excel). We have calculated three probable scenarios of the forecast regarding the increase in the average population in Ukraine as well, including due to the possible return of refugees (Table 13).

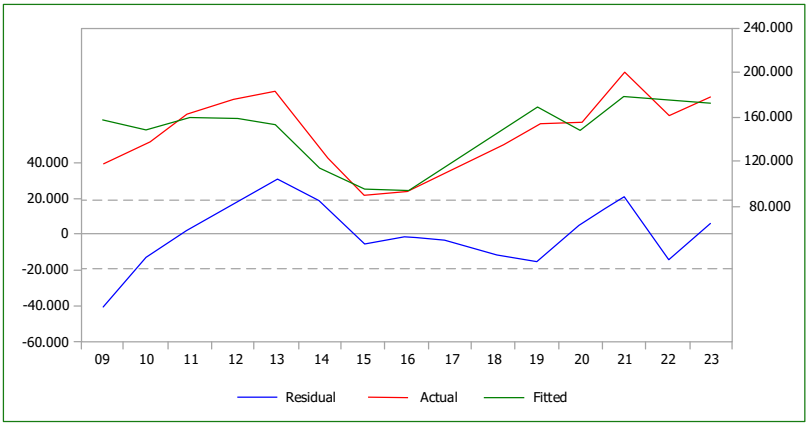

Figure 2. Explanatory ability of the model.

We build a forecasting trend based on selected variables of influence on GDP (Figure 3).

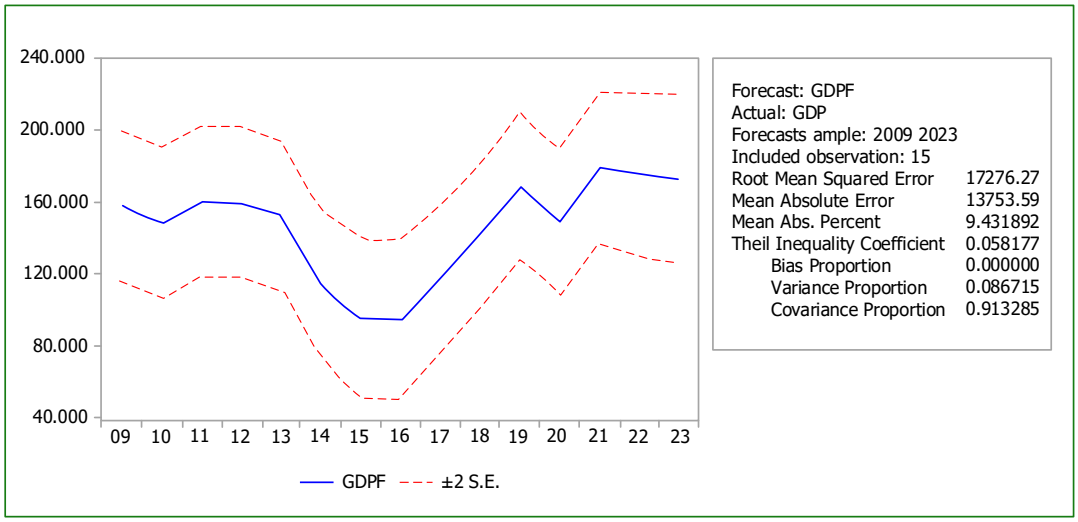

Figure 3. Forecast of GDP

Table 13. Scenarios of forecasting.

Obs	The most probable forecast	Pessimistic forecast	Optimistic forecast
2023	**The population of Ukraine, the base value is based on 34.9 million**		
2024	35.510124	32.56	38.46
2025	34.838629	31.54	38.14
2026	34.167133	30.55	37.79
2027	33.495638	29.58	37.41
2023	**GDP of Ukraine, the base value is taken as a basis of USD 178 775.6 million**		
2024	180949.1	117430.50	244467.70
2025	183122.59	93338.63	272906.56
2026	185296.09	75315.31	295276.87
2027	187469.59	60432.36	314506.82

At the same time, many factors influence the return of refugees:

1. The duration of the war, which continues for 2023.
2. Security and stability, including political stability (risk of persecution or violence, and especially for men aged 18-60).
3. Political rights, the government's commitment to protect the rights of returnees, which will give refugees confidence to return.
4. Infrastructure, which is especially important for the part of refugees who have lost their homes. The state should make every effort to restore the affected territories and attract refugees to return to Ukraine with various programs and tools.
5. Restoration of infrastructure and economic growth can contribute to the increase of jobs and new employment opportunities. Availability of work and access to financial resources are essential for returnees to rebuild their lives and sustain themselves economically upon return.
6. Social cohesion, acceptance and support from local communities, as well as the availability of psychosocial support services, can significantly influence returnees' well-being and sense of belonging.
7. Reunification with loved ones can encourage refugees to return despite the difficulties they may face.

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8. Overcoming corruption, access to justice are the reforms that must continue to be implemented in Ukraine, and which will become an attractive factor for the return of refugees.
9. International support and assistance, including humanitarian aid, development assistance and capacity-building initiatives, can play a critical role in facilitating refugee return. Cooperation between governments, international organizations, civil society and donor organizations is essential to address the multifaceted challenges of return and support sustainable reintegration efforts.

Therefore, a small part of the refugees will definitely return to Ukraine. GDP per capita has a positive trend (Figure 4).

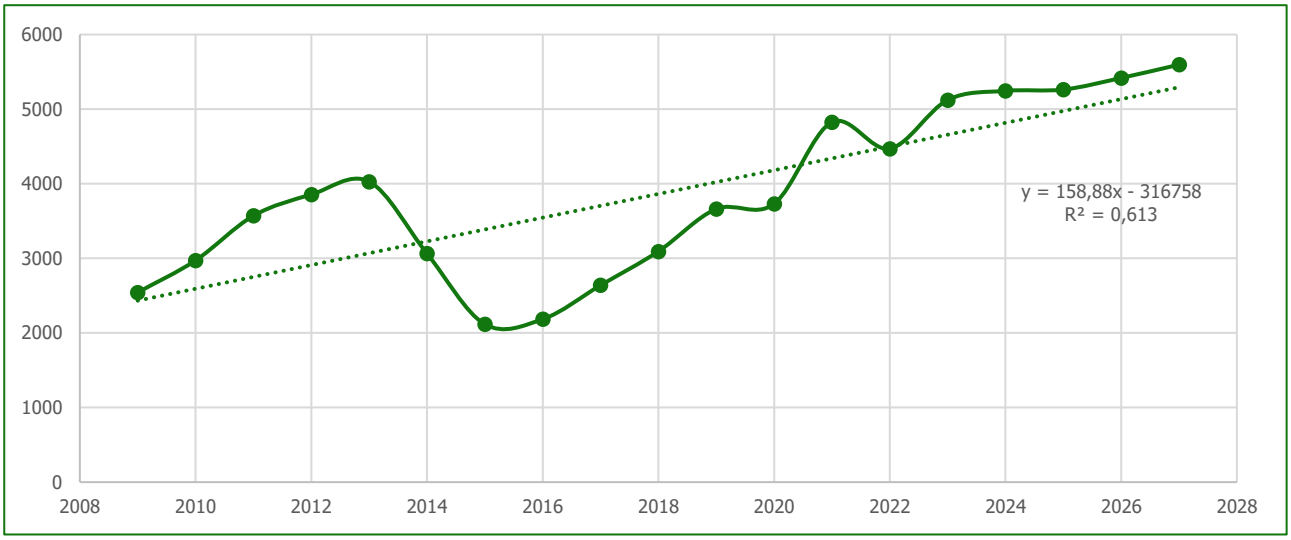

Figure 4. GDP trend per capita for the period 2024-2027.

The level of approximation in Figure 4, which is equal to 61.3%, indicates that the trend is approaching reliable data (the trend equation can be used for further forecasts if this level is at least 50%). So, despite what exists from the experience of previous major wars, there is a high probability that refugees will not return to Ukraine, GDP per capita will grow.

So, we have a statistically significant equation with a high coefficient of determination:

$$GDP = -11083.8026951*P - 2205.05321516*SD + 745267.5808 \quad (3)$$

The multiple regression model predicting the development of GDP based on independent factors was successfully tested. All examinations and testing have confirmed the accuracy of this model for Ukraine. This means that:

- the equation represents an economic-mathematical model at a high level of quality;
- the equation is statistically significant with a high coefficient of determination;
- the model built by the authors is adequate and fully acceptable for forecasting in the future with a deviation of 9.43% from the actual values.

DISCUSSION

Today, it is quite difficult to fix the most significant decisions in the future regarding the return of refugees and the mechanism of implementing an effective migration policy, but the experience of recent wars (for example, Bosnia and Herzegovina, etc.) should be analyzed in order to develop a correct policy for the return of refugees in Ukraine.

The future difficulties that Ukraine will face in the process of restoring the infrastructure and the economy in general are connected with the fact that:

- experts currently cannot name the number of financial losses as the war continues. At the same time, according to various experts' estimates, the Ukrainian economy has lost from 30% to 50% of its production capacity by 2023, while the losses are concentrated in economically important regions in the east and south of Ukraine, where hostilities continue today [25];

- limited data, i.e., it does not have definitive data on how the population of Ukraine is decreasing (declining birth rate, civilian and military deaths, missing persons, return/non-return of refugees). What is the real number of the population of Ukraine currently living outside the country, as well as in Ukraine, cannot be definitively stated? As Doctor of Philosophy, demographer, and visiting professor-researcher at El Colegio de Mexico, Jose Miguel Guzman noted, according to the results of a study funded by the Council of the EU, depending on the duration of the war, the population of Ukraine may decrease by 24-33% [27, P.153];
- the fact remains unclear, what will happen to the industrial production that was destroyed by the war, will reparations be directed?
- national initiatives for post-war recovery and reconstruction in the conditions of the continuation of the war cannot yet be finalized; it is not clear how their coordination will take place.

The phase of post-war reconstruction will start once the war is over. The human aspect (migration flows), infrastructure (which is continuously attacked and destroyed), and financial resources are the primary levers of control on the economy. There will undoubtedly be an economic rebound; however, the exact date of this recovery will depend on the methods and plans selected. First, despite incredibly challenging circumstances, the national economy continues to grow and operate, guaranteeing job availability. In fact, there are gaps in the form of declining earnings as a result of inflation and a lack of funds in relation to the overall state of the economy. Statistical indicators, however, attest to the alleged stability of Ukrainian business. Specifically, if 79% of the nation's enterprises were closed or about to close in March 2022, this number dropped to 32% by the end of the year, a surprising result given the extent of the devastation. Second, the rehabilitation of devastated cities and the assistance of the most vulnerable segments of the populace were made possible by the help and assistance of international allies. Positive examples include: the reconstruction of Bucha, Kyiv region following deoccupation at the expense of grant programs with UNDP participation and support [31]; humanitarian organizations have already allocated USD 75.7 million in 2024 [29] for the immediate and priority needs of the affected population (IDPs and other vulnerable population groups).

It should be highlighted that the examples provided attest to the successful and long-lasting collaboration between public-private partnership issues in Ukraine and around the globe for the advancement and execution of initiatives and programs in utterly unrelated fields. In addition, national and international cooperation in public policy is required to establish an ecosystem of this kind of interaction that promotes sustainable development, aids in the resettlement of refugees, and facilitates post-war rehabilitation. Thus, putting any plans and successful initiatives into action with the help of partnerships is a crucial component of the economy's recovery and stabilization. In order to carry out initiatives in post-war infrastructure rebuilding, territorial development, and/or service provision, we define such a partnership as a collaboration between authorities, local self-government, and the private sector. This strategy will help projects become more efficient, competitive, and of higher quality.

At the same time, we need to note that postwar reconstruction is a difficult process that must be informed by the experiences of other countries. The Balkan countries' recovery programs (PHARE, EAP, OBNOVA, SAP, and BiH programs) are the most well-known examples of countries recovering from the 1990s. These EU programs and financial instruments provided assistance to Central and Eastern European countries, allowing for the development of infrastructure and economic recovery, particularly in countries that suffered after the war (the Federal Republic of Yugoslavia, Croatia, Bosnia and Herzegovina, Macedonia). It is also necessary to take into account the experience of these countries in returning refugees. It is necessary to give Ukrainian citizens the prospect of staying in their country and soften further immigration flows.

In Ukraine, a draft Recovery and Development Plan has been developed as an overall framework guiding the recovery process, allowing for coordinated multi-stakeholder participation and partnership [9; 22]. The recovery plan of Ukraine is aimed at accelerating sustainable economic growth, within which a list of National programs for achieving key results is defined. Rebuilding the country will require the return of refugees to pave the way for long-term sustainable growth.

"At the same time, no matter how effective the state's policy is, it is necessary to understand that all Ukrainians who have gone abroad will not return. Refugees who lost absolutely everything in Ukraine started a new life abroad, they may not have the desire to go through this path again in Ukraine" [15, p.76].

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CONCLUSIONS

Conclusions of the developed model:

1. The return of migrants to Ukraine, i.e., the increase in population can have two-fold consequences for GDP. Although it should be noted as the experience of the Second World War showed, only 30-40% of refugees returned; of course, the percentage of returns directly depends on the length of the war in Ukraine, and the longer the war lasts, the fewer refugees will return to Ukraine.
2. Classical macroeconomic postulates indicate a clear connection between the dynamics of GDP and employment. The higher the employment of returned refugees, the more positive is the factor of monetary and fiscal stabilization, which means an increase in GDP and economic growth.
3. Thus, population expansion may, on the one hand, boost domestic demand for products and services, which may then help the GDP grow. However, if labour productivity and production do not rise in tandem with the population growth, and if the war destroys a lot of industries, particularly in the east, this can result in overcrowding in the country's central and western regions and a rise in unemployment that will hurt GDP. These kinds of effects are more likely to occur in the early post-war years.
4. State programs should facilitate the return of migrants. Ukrainian migrants can help with postwar reconstruction, contributing to economic growth. In this context, the public-private partnership is relevant, as it ensures the speed and reliability of the processes of restoring countries' economies, particularly in emergency situations and during the postwar period.
5. The debt-to-GDP ratio typically rises in response to rising debt payment expenses, which can cut into the amount of money available for infrastructure, economic development, and education. It makes sense that Ukraine's debt will increase in the third year of the war. In addition, as debt levels rise, the economy's efficiency and output potential are reduced, which can result in a decline in GDP.
6. Ensuring GDP growth and sustainable economic growth will be difficult in Ukraine due to the debt burden. According to the NBU, in relation to GDP, the amount of debt in war conditions is only increasing, so by the end of 2023 it was 82.3% [20]. In general, changes in P and SD variables can have a compound effect on a country's GDP, and the actual effects will depend on the specific conditions and context of the economy.

ADDITIONAL INFORMATION

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Investigation: *Svitlana Tkalenko*

Visualization: *Roksoliana Liubachivska, Viktoriia Kosytska*

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Writing – original draft: Svitlana Tkalenko

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CONFLICT OF INTEREST

The Authors declare that there is no conflict of interest.

REFERENCES / ЛІТЕРАТУРА

1. Pikulicka-Wilczewska, A., & Uehling, G. (2017). Migration and the Ukraine Crisis. A Two-Country Perspective. E-books, 220 p. https://www.e-ir.info/publication/migration-and-the-ukraine-crisis-a-two-country-perspective/
2. Bondar, T.V., & Ganyukov, O.A. (2023). External migration of Ukrainians before and after the full-scale aggression (comparative analysis). *Ukrainian society, 1*(84), 32-53. https://doi.org/10.15407/socium2023.01.032
3. Chernenko, N.I. (2023). Migration processes in the conditions of war: ways to solve problems. *Tavriysk Scientific Bulletin*, *16*, 229-235. https://doi.org/10.32782/2708-0366/2023.16.30
4. Collection of statistical data of UNHCR. (n.d.). https://data.unhcr.org/en/situations/ukraine
5. Duszczyk, M., & Kaczmarczyk, P. (2022). The War in Ukraine and Migration to Poland: Outlook and Challenges. *Intereconomics*, *3*. https://www.intereconomics.eu/contents/year/2022/number/3/article/the-war-in-ukraine-and-migration-to-poland-outlook-and-challenges.html
6. Economic Information Center. (2023, August 29). *Analytical note. Refugees from Ukraine: who are they, how many are there and how to return them?* https://ces.org.ua/wp-content/uploads/2023/09/refugees.pdf
7. Elspeth, Guild, & Kees, Groenendijk. (2023). The impact of war in Ukraine on EU migration. *Frontiers in Human Dynamics*, *02 June*. https://doi.org/10.3389/fhumd.2023.1189625
8. External debt of Ukraine at the end of 2023. (n.d.). NBU. https://bank.gov.ua/files/ES/ExDebt_y.pdf
9. Government portal. (n.d.). https://www.kmu.gov.ua/news/opryliudneno-dlia-komentuvannia-rozdily-planu-vidnovlennia-ukrainy
10. Alareeni, B., Hamdan, A. et al. (2023). Latest Challenges of International Migration for Ukraine: Theoretical and Empirical Aspects. *Sustainable Finance, Digitalization and the Role of Technology*. *Lecture Notes in Networks and Systems, 487*. Springer, Cham. https://doi.org/10.1007/978-3-031-08084-5_9
11. Immigration of Ukrainians 2023: Impact of Ukraine-Russia war. (2023). LegaMart. https://legamart.com/articles/immigration-of-ukrainians/
12. Kuryliuk, Y. (2022). Impact of the russian-Ukrainian war on migration processes in the region. *Customs Scientific Journal*, *2*, 48-54. https://doi.org/10.32782/2308-6971/2022.2.7
13. Sudakov, M., & Lisohor, L. (2023). Labor market of Ukraine 2022-2023: state, trends and prospects. State Employment Service of Ukraine, Federation of Employers of Ukraine, Ministry of Education and Science of Ukraine, European Bank for Reconstruction and Development, Solidarity Fund PL.
14. Lomonosova, T. (2020). 1% of Poland's GDP growth was provided by Ukrainian migrants. *Independent cultural journal*. http://www.ji-magazine.lviv.ua/2020/11proc-zrost-VVP-polschi-zabesp-ukr-migranty.htm
15. Lytvynchuk, O.V., & Yurkivskyi, O.Y. (2023). Migration processes in Ukraine: threats in the conditions of the Russian-Ukrainian war. *Economy, management and administration*, *2*(104), 71-76. https://doi.org/10.26642/ema-2023-2(104)-71-78
16. Malinovska, O. (2024, April 17). The return of forced migrants to their homeland as the best solution: factors and means of its provision. https://niss.gov.ua/doslidzhennya/sotsialna-polityka/povernennya-vymushenykh-mihrantiv-na-batkivshchynu-yak-naykrashche
17. Malinovska, O. (2023). Ukrainian war refugees in Europe: between integration and return. https://niss.gov.ua/doslidzhennya/sotsialna-polityka/ukrayinski-bizhentsi-viyny-v-yevropi-mizh-intehratsiyeyu-ta
18. Ministry of Finance of Ukraine. (2023, March 23). Employees transferred almost $13 billion to Ukraine in 2022. https://minfin.com.ua/ua/2023/03/23/102854923/
19. Ministry of Finance of Ukraine. (n.d.). https://index.minfin.com.ua/ua/finance
20. National Bank of Ukraine. (2023). https://bank.gov.ua/files/ES/ExDebt_y.pdf
21. Menok, D. (2024). Financial report: in 2023, the share of Ukrainians in Polish GDP was from 0.7 to 1.1 percent. *Polska Agencja Prasowa*. https://www.pap.pl/ua/ukrainian/news/finansoviy-zvit-u-2023-roci-chastka-ukrainciv-u-polskomu-vvp-stanovila-vid-07-do-11
22. Recovery of Ukraine. (n.d.). https://recovery.gov.ua/
23. Refugees from Ukraine: who are they, how many are there and how to return them? (2023). *Center for Economic Strategy*, *07 September*. https://www.sapiens.com.ua/ua/publication-single-page?id=280
24. Simakhova, A.O. (2022). Migration processes in Ukraine during the war: social aspect. *Economy, management and administration, 4*(102), 60-64. https://doi.org/10.26642/ema-2022-4(102)-61-64
25. The IMF expects a fall in Ukraine's GDP in the fourth quarter of 2022 by 40,5%. (n.d.). https://gmk.center

DOI: 10.55643/fcaptp.6.59.2024.4559

26. Potapenko, V. et al. (2023). The impact of migration on the socio-economic situation in Ukraine. Analytical report. The ed. Kyiv: *NISS*, 33 p. https://niss.gov.ua/sites/default/files/2023-01/ad_mihratsia_gotove_03_01_2023.pdf

27. Yakymenko, Yu. (2023). The influence of migration processes on the course of post-war reconstruction of Ukraine, migration policy of the EU and Eastern Partnership countries. Kyiv: *Razumkov Center*. https://razumkov.org.ua/images/2023/10/25/2023-Pyshchulina-MIGRACIA.pdf

28. The UN Refugee Agency. (n.d.). https://www.unhcr.org/refugee-statistics/insights/annexes/trends-annexes.html?situation=1

29. Ukraine Humanitarian Fund: First Standard Allocation 2024 (2024, June 30). https://reliefweb.int/report/ukraine/ukraine-humanitarian-fund-first-standard-allocation-2024-30-june-2024-enuk

30. Ukrainian refugees: Nearly half intend to stay in Germany in the longer term. (2023, July 25). Federal Office for Migration and Refugees. Joint research project of the Institute for Employment Research (IAB), the Federal Institute for Population Research (BiB), the Research Centre of the Federal Office for Migration and Refugees (BAMF-FZ) and the Socio-Economic Panel (SOEP) at the German Institute for Economic Research (DIW Berlin). https://www.bamf.de/SharedDocs/Meldungen/EN/2023/230725-am-ukr-projekt-zweite-welle.html?nn=285460

31. UNDP will help restore destroyed houses in Kyiv region. (2023, October 10). Kyiv: *Public Kyiv*. https://suspilne.media/kyiv/591325-proon-dopomagatime-vidnovluvati-zrujnovani-budinki-na-kijvsini/

32. Verhovetska, A., & Kyrychenko, Yu. (2024, March 07). Ukrainian refugees in Poland have a positive effect on the country's economy. The United Nations Office for Refugees has released a report. https://naszwybir.pl/vplyv-ukr-na-pl-ekonomiku/

33. Volosatska, N. (2024, March 25). The largest employment companies in the European Union. https://www.radiosvoboda.org/a/ty-iak-bizhentsi-ekonomika-rynok-pratsi-polshcha/32874526.html

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ДОВГОСТРОКОВІ ДЕТЕРМІНАНТИ ЕКОНОМІЧНОГО РОЗВИТКУ: ВПЛИВ МІГРАЦІЙНИХ ПОТОКІВ НА ЕКОНОМІКУ УКРАЇНИ

У статті розглянуті актуальні проблеми економічного розвитку України в довгостроковій перспективі після закінчення війни в контексті руху міграційних потоків. Автори зазначають, що драйверами повернення біженців по закінченні війни можуть стати: економічне зростання, що забезпечить їм робочі місця; залучення іноземних інвестицій, диджиталізація економіки, використання ІКТ, цифрових технологій і зростання добробуту населення. Автори дійшли висновку, що в короткостроковій перспективі, з одного боку, масове повернення біженців може призвести до перенаселення (особливо в центральній і західній частинах країни) та підвищення рівня безробітних, що негативно вплине на ВВП; з іншого боку, це може призвести до появи нових галузей промисловості або пожвавлення регіонів, які занепадають, що зрештою позитивно вплине на зростання ВВП. Для такого позитивного тренду мають бути розроблені державні програми для повернення біженців. Біженці можуть брати участь у повоєнному відновлені, що сприятиме економічному зростанню. У цьому контексті важливим для України стає публічно-приватне партнерство, що сприяє ефективності взаємодії між його суб'єктами, забезпечує стрімкість і надійність процесів відновлення економіки країн, особливо в умовах надзвичайних ситуацій та в повоєнний період. Негативний тренд підсилюється великим обсягом боргу, який формується в умовах війни, що також може призвести до зменшення ВВП через обмеження виробничих можливостей і знищення певних виробництв, а також зниження ефективності економіки.

У досліджені показано, як повернення мігрантів уплине на рівень зайнятості, попит і пропозицію на ринку праці. Побудована модель економічного зростання України та перевірені фактори, які здійснюють найбільший вплив на ВВП в контексті міграційної хвилі, що пов'язана з війною.

Ключові слова: міграційні потоки, біженці, економічний розвиток, ВВП, сталий розвиток, державно-приватне партнерство, повоєнне відновлення, зовнішній борг

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