

WHICH ECONOMIC FACTORS ARE ASSOCIATED WITH MIGRATION INFLOWS FROM
UKRAINE TO EU COUNTRIES

by

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LIST OF ABBREVIATIONS

EU – European Union

GDP – Gross Domestic Product

TWFE – Two-Way Fixed Effects

LASSO – Least Absolute Shrinkage and Selection Operator

RMSE – Root Mean Squared Error

OLS – Ordinary Least Squares

OECD – Organisation for Economic Co-operation and Development

Abstract

This paper explores what economic characteristics of EU countries are appealing to migrants from Ukraine and how these characteristics affect migrant destination. The study is based on the data of 15 EU countries for the period 2013–2021 and deals with the logarithmic values of the migration flows.

The data is analyzed using a “two-way fixed effects” (TWFE) model, which also controls for country-year variation. In this model all the independent variables are lagged one year and the standard errors are clustered (grouped) at the country level. Further, I compare the LASSO model results to test the consistency of the results and test the predictions by the LASSO model based on the RMSE score of the test sample.

The results show that income level (GDP per capita) and labour demand (job vacancy rate) have the most stable and statistically significant association with migration inflows. In particular, a 1% increase in GDP per capita is associated with an increase in migration inflows of approximately 6.5% in the following year. This elasticity is relatively high compared to many cross-country migration studies, where income elasticities are usually closer to 1–2. One possible explanation is that the two-way fixed effects model captures within-country changes over time after controlling for fixed differences between countries and common year effects. Other variables, such as inflation, housing costs, and social protection, do not show consistent effects.

The findings should be interpreted with caution, as the analysis is conducted at the country level and does not include individual or non-economic factors, such as migration networks or cultural ties.

Chapter 1. Introduction

Migration has turned into a widespread process both to the sending states and the receiving states. Within the framework of Ukraine, the problem is especially relevant, as a significant part of the population has moved to other countries in search of a better life. Ukrainian migrants do not choose host countries by chance but usually have a number of options and make their choices on the basis of certain factors.

The European Union has wide-ranging potential migration destinations that differ in terms of income, labour market, and the cost of living. This fact raises an automatic question: why Ukrainian migrants choose some EU states more than others?

Migration is often explained by the general reasons, including the need to earn more money or to get a job. However, these broad descriptions do not specify the specific economic factors that are the most influential. In the range of economic conditions, different indicators can have different relationships and the relative significance is not always equal.

As a result, economic factors can be considered the most plausible explanatory framework. Destination choice may be determined by variables like income level, employment prospects and real living conditions. Nevertheless, these factors do not equally affect migration decisions, some of these factors might have a dominant role and some have a secondary or temporal effect.

Therefore, it is not only necessary to determine whether migration is determined by economic conditions, but also to determine the most important factors. This level of clarity helps make a shift between generic theoretical explanations of migration to a more detailed study of destination choice.

The proposed research focuses on economic factors and how they are associated with migration inflows between Ukraine and the EU member countries. The main hypothesis is the fact that migration is an economically responsive behavior which can vary in its salience across national settings.

The analysis uses panel data of EU countries over the period 2013–2021. The dependent variable is annual migration inflows, meaning the number of people moving to a particular country

in a given year, rather than the total stock of migrants already living there. This methodological option allows focusing on the time point of the decision to migrate, and not on the aggregate stock of migrants.

The methodology of the research uses a fixed-effects model to represent inter-country heterogeneity and changes in economic conditions over time and thus allows for a more accurate estimate of the relationship between economic variables and migration inflows. In turn, the LASSO method is used to assess the robustness of the findings.

In this regard, the main research question can be formulated as follows: What economic characteristics of European Union countries are associated with migration inflows from Ukraine, and how these factors contribute to differences in destination choice across countries?

The answer to this question would contribute to a better understanding of the migration processes and help to establish the economic conditions that have the greatest influence on destination choice.

Chapter 2. Literature review

Migration is a worldwide phenomenon and has generated the interest of many researchers, especially in an economic context. In the modern globalized world, international migration flows remain active and tend to increase. The Centre for Economic Strategy notes that international migration flows are generally directed from less developed countries to developed countries (Piontkovska et al. 5). This shows that migration is connected not only with individual decisions, but also with broader differences between countries. People cross borders for different reasons, including economic, political, social, and personal motives. In the case of economic migration, the decision to move can be understood as a comparison of the possible benefits and costs of moving abroad (Piontkovska et al. 10). Therefore, economic migration can be analysed at the macro level through differences in economic opportunities between origin and destination countries.

Economic factors are especially important when migrants choose between possible destination countries. In the Ukrainian case, the Centre for Economic Strategy discusses labour migration as a separate type of external migration and shows that Ukrainian labour migration is closely connected with employment abroad (Piontkovska et al. 16). The same report also notes that better wages and social benefits abroad attract Ukrainian labour migrants (Piontkovska et al. 23). This is directly related to the focus of this thesis, because the study examines how economic conditions in European destination countries are associated with Ukrainian migration flows.

The importance of economic attractiveness is also supported by international migration studies. Geis, Uebelmesser, and Werding explain that, from an economic perspective, people migrate when the expected utility of living abroad is higher than the expected utility of staying in the source country (Geis et al. 1). In their empirical framework, they focus on expected net income, social networks, labour-market institutions, and publicly provided goods such as health and education systems as factors that may influence destination choice (Geis et al. 1). Their estimation results show highly significant positive effects for wages, highly significant negative effects for unemployment rates, and a positive effect of immigrant networks on destination choice (Geis et al. 9). These findings

support the idea that income, employment prospects, and networks can shape migrants' location choices.

Lewis and Swannell also connect migration flows with macroeconomic conditions. They summarize previous findings by stating that lower GDP and higher unemployment in origin countries are associated with larger migration outflows, while higher GDP and lower unemployment in destination countries are associated with larger inflows (Lewis and Swannell 4). In their own results, they find that, on the destination side, higher output, higher expected growth, lower unemployment, and greater labour-market flexibility are associated with higher migration inflows (Lewis and Swannell 15). This supports the idea that migrants may respond not only to current income and employment conditions, but also to expectations about future economic prospects.

The role of income differences is also emphasized by Mayda. She analyses bilateral migration flows and finds that pull factors, defined as improvements in mean income opportunities in destination countries, significantly increase emigration rates (Mayda 18). Mayda also notes that the effect of push factors from origin countries is smaller and less consistently significant than the effect of pull factors (Mayda 18). This is important for this thesis because the research question focuses on destination choice. It suggests that differences between destination countries may matter strongly for migration flows.

Social and non-economic factors are also discussed in the literature, but the evidence is less straightforward. Czaika and Reinprecht show that wage differentials and higher income levels in destination countries attract migrants, but they also note that other drivers may also be at play (Czaika and Reinprecht 64–65). This means that migration should not be reduced to only one economic reason. At the same time, Mayda finds no strong evidence that cultural variables play a significant role in explaining migration flows (Mayda 5). Therefore, social and cultural factors may matter, especially for adaptation and integration, but the quantitative studies used in this review give stronger direct support to economic factors such as income, unemployment, expected growth, and labour-market conditions.

The European Union was chosen as the focus of this study because it allows comparison between destination countries that are located in the same regional context but differ in economic conditions. EU countries differ in income levels, unemployment, labour-market conditions, social protection, and economic stability. This makes them suitable for studying economic determinants of destination choice. Lewis and Swannell find that under freedom of movement, the response to macroeconomic variables is stronger (Lewis and Swannell 24). This is relevant for the European context because lower mobility barriers may make economic differences between destination countries more visible in migration flows. In the Ukrainian case, migrants can choose between several European countries with different wages, job opportunities, and labour-market conditions. Therefore, the EU context provides a useful setting for analysing how economic factors are associated with Ukrainian migrants' destination choice.

Existing studies confirm the importance of wages, unemployment, GDP, expected growth, labour-market flexibility, networks, and institutional factors for migration decisions. However, these studies mostly analyse general international migration patterns or broad determinants of migration. They do not fully explain which economic factors are most important when Ukrainian migrants compare different European destination countries. Because of this gap, this thesis focuses not only on whether economic factors matter, but on which economic conditions have the strongest association with Ukrainian migrants' choice of destination country. The study examines how differences in job opportunities, wages, economic growth, unemployment, and other macroeconomic indicators help explain why Ukrainians choose one European country over another.

Chapter 3. Research Question and Hypotheses

Previous studies on the economics of migration show that economic conditions in the destination country play an important role in shaping migration flows. Most often, the literature considers indicators such as income levels, labour market conditions and the overall economic situation. At the same time, most studies focus on the general causes of migration and do not analyse in detail the process of choosing a specific destination country.

This study focuses on the choice of destination countries by Ukrainian migrants among the countries of the European Union. This approach allows us to consider countries with similar migration and labour regulations and reduce the influence of legal differences between them. This makes it possible to focus on the role of the economic characteristics of destination countries.

Accordingly, the research question is formulated as follows: What economic characteristics of European Union countries are associated with migration inflows from Ukraine, and how these factors contribute to differences in destination choice across countries?

Based on a review of the literature, the following hypotheses are put forward:

Hypothesis 1. Countries with higher income levels are associated with higher migration inflows from Ukraine.

Hypothesis 2. Countries with better labour market conditions are associated with higher migration inflows from Ukraine.

Hypothesis 3. Better real living conditions and economic stability are associated with higher migration inflows from Ukraine.

Chapter 4. Data and Methodology

4.1 METHOD OF ANALYSIS

The main purpose of the current research is to analyze how the current economic situation in the Member States of the European Union is related to the inflows of migrants with Ukrainian origin. The dataset includes a group of destination countries in 2013-2021, which makes a panel data approach quite appropriate. Panel data can be used to analyze cross-country differences and time effects in one analytical framework.

The fundamental empirical methodology used is the fixed-effects country-year panel regression. The country-specific fixed effects adjusts the time-invariant characteristics, including geographical location, the overall institutional quality, or migration networks. Year-fixed effects explain the shocks that are similar in time across all countries at the same time, such as economic crises or political transitions. Standard errors are concentrated at the national level so as to improve the reliability of estimation.

The dependent variable is the natural log of the annual inflow of Ukrainian migrants. A logarithmic specification was preferred over count-data models such as Poisson regression because migration inflows in the sample vary substantially across countries and years. In addition, the log transformation reduces distributional skewness and allows coefficients to be interpreted more naturally in relative (elasticity-type) terms. All the explanatory variables are one-year lagged, which is based on the assumption that migration decisions are made based on the economic conditions of the previous year rather than current indicators.

In addition to the fixed-effects specification, a time-respecting train/test split with LASSO regression is estimated. The sample is divided into a training period (2013–2018) and a hold-out test

period (2019–2021). To avoid information leakage, the model is trained only on past observations and evaluated on later years.

The LASSO penalty parameter is chosen during the training stage through rolling cross-validation, in which the model is re-estimated on previous years and tested on the following year. Model performance is evaluated using the Root Mean Squared Error (RMSE) on the hold-out test sample. All ten lagged macroeconomic indicators were retained by the LASSO procedure, including income-related variables (log GDP per capita, log median disposable income), labour-market indicators (unemployment rate, vacancy rate, employment protection index), cost-of-living measures (purchasing power index, housing cost overburden rate), and additional controls (tax wedge, inflation, and social protection expenditure). Therefore, the final interpretive specification remains the original two-way fixed effects model with all lagged predictors included. In this study, LASSO is used primarily as a robustness and predictive-performance check rather than as a strict variable-selection tool.

For comparison, a simple baseline model including only GDP per capita and job vacancy rate is also estimated to assess whether a more complex specification improves predictive accuracy. The comparison between the baseline and LASSO models is used to evaluate the additional predictive contribution of the remaining economic indicators.

4.2 ECONOMETRIC MODEL

The baseline model is specified as: $\log(\text{Migration inflow}_{it} + 1) = \beta_0 X_{i,t-1} + \alpha_i + \gamma_t + \varepsilon_{it}$

where i denotes the destination country and t denotes the year, $\log(\text{Migration inflow}_{it} + 1)$ is the logarithm of the annual inflow of Ukrainian migrants to country i in year t , β_0 is the intercept, $X_{i,t-1}$ is a vector of time-varying economic characteristics of the destination country, lagged by one year, α_i represents country fixed effects, which capture unobserved, time-invariant characteristics of

countries such as geography, long-term institutional features, or cultural factors, γ_t represents year fixed effects, which control for common shocks affecting all countries in a given year, such as macroeconomic crises or geopolitical events, ε_{it} is the error term.

4.3 DATA SOURCE

The data in this study is an annual data from 2013 to 2021. The information was obtained from official international statistical databases such as Eurostat, OECD and the World Bank. These sources are commonly referred to in many economic studies and are good indicators.

The unit of analysis is country of destination and year. Emphasis is laid on migration to the European Union countries from Ukraine. This way we can see which EU countries are more accepting of Ukrainians and how this situation has evolved over time. Meanwhile, Eurostat only offers data for a majority of EU countries and for some countries data on migration flows from Ukraine is lacking for several years.

The sample was originally the 27 European Union countries. Cyprus, Malta, France, Ireland, Poland, Portugal and Greece were not included, however, since they did not provide consistent migration inflow numbers from Ukraine for several years. This can either be due to underreporting in statistics or to a variation in the way migration is recorded between different countries and not because there are no migration flows. Furthermore, the Polish case may be related to the reporting differences of Eurostat, for example, Poland was one of the principal destinations for Ukrainian migrants in the period analysed, according to national administrative statistics.

The time period of 2013-2021 was selected as it falls within the pre-invasion period and is relatively stable in terms of availability of consistent annual data for the countries selected.

The data were initially limited to 20 destination countries in the EU, over 2013-2021 (unbalanced panel), due to availability of data on migration flows from Ukraine. The estimation

sample in the main regressions runs from the data preparation step includes 15 EU countries: Austria, Czechia, Estonia, Finland, Germany, Hungary, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Slovakia, Slovenia, Spain, and Sweden. It is important to note that this difference between the analytical sample (20 countries) and the estimation sample (15 countries) is due to the requirement for data to be complete for the econometric analysis.

4.4 SELECTION OF VARIABLES

Dependent variable means that in this study the dependent variable is the amount of Ukrainian migrants that will come to the European Union countries per year. The analysis is based on the number of people who immigrated to a specific country during a specific year (migration flows) and not on the total number of Ukrainians residing in this country (migration stocks). So, the variable indicates the number of Ukrainians who came to live in every EU country during the specific year. The data comes from Eurostat table 'Immigration by age group, sex and citizenship' which provides detailed information on the flows of immigrants by country of destination and by citizenship for each year. The use of flows is suitable since the study focus is on the choice of country at the time of migration, rather than migrants' long-term presence in the country. The Eurostat measure on citizenship includes formally registered immigration from Ukraine. It does not, however, cover undocumented migration, short-term seasonal labour mobility and ethnic Ukrainians with EU member state passports. However, the measure is likely to be an underestimate of overall migration flows, but is fairly well-specified in terms of the countries of destination.

The dependent variable was transformed by $\log(\text{Migration inflow}_{it} + 1)$ because there is a positive correlation between the size of countries and the number of migrants accepted. This makes the distribution of the variable closer together across different countries and brings the scale

dimension more in line. The addition of one then enables for cases where there is no influx of migrants. This log transformed variable is called `log_migration` in the empirical analysis.

Independent variables: the study uses several independent variables, which are divided into three main groups:

- Income and economic attractiveness
- Labour market opportunities
- Real living conditions

This division helps to see more clearly what matters most in migration choices: income level, chances of finding a job, or real living conditions after relocation.

Income and economic attractiveness: the first set of variables characterises the overall economic situation of the destination country and the potential income level for migrants. One of the key indicators used is GDP per capita. It reflects the overall level of economic development. The higher this indicator, the more opportunities there are for employment and higher income. Data obtained from the World Bank. For a better understanding of the real standard of living, median disposable income is taken into account. It shows the income of an ‘average’ household after taxes. Unlike the average, the median is not distorted by very high incomes, so it better reflects the financial situation of the majority of the population. The source of the data is the OECD. The tax wedge - the share of labour income paid in taxes and social contributions - is taken into account separately. It is important for potential migrants to understand not only the level of wages, but also what net income they will actually receive. The data is also taken from the OECD.

Labour market opportunities: the second set of variables describes the labour market situation in the destination country and the chances of finding a job. The unemployment rate is used as a general indicator of the difficulty of finding employment. If unemployment is high, this means greater competition for jobs and fewer opportunities, including for migrants. Data obtained from the World Bank. The vacancy rate reflects the demand for labour. It shows how many open positions employers are trying to fill. The higher this indicator, the more actively companies are looking for employees,

and therefore the greater the likelihood of finding a job. Data provided by Eurostat. The Employment protection legislation Index characterises the degree of regulation of the labour market. It shows how easy or difficult it is for an employer to hire or fire an employee. In countries with a more flexible labour market, it is usually easier for new employees, including migrants, to find employment. Data obtained from the OECD.

Real living conditions: The third set of variables reflects the living conditions that migrants encounter after moving. The purchasing power index is used to account for differences in the cost of living between countries. It shows how many goods and services can be purchased with a given level of income. In other words, this indicator helps to understand not only the size of earnings, but also their real value. Data obtained from Eurostat. The housing cost burden indicator is also taken into account. It shows what proportion of income a household spends on housing. If this proportion is high, housing is considered less affordable. For migrants, especially in the first years after moving, housing costs are one of the main practical problems. Data also provided by Eurostat.

Additional economic indicators: the model also includes inflation and social protection expenditure to take into account the overall economic situation in the country. Inflation shows how prices change over time and whether the cost of living is rising. Social protection expenditure reflects how developed the social support system is in a country. Together, these indicators allow for differences in economic stability and levels of social support between destination countries to be taken into account. Data obtained from Eurostat.

The complete list of variables used in the study, together with their definitions and data sources, is presented below (see Table A1).

4.5 DATA PREPARATION

First, all datasets were converted to a single format, where only three variables remained for each indicator: country, year, and indicator value, meaning that all tables looked the same. This made

it easy to combine them correctly without confusion in country names, years, or columns, and without losing data.

Since the names of countries could differ in different databases, they had to be standardized before merging. For example, some sources used the name ‘Czech Republic’, while others used ‘Czechia’, so all variants were replaced with a single agreed form. This was important because even a slight difference in spelling could cause the programme to perceive the same country as different entities. Harmonising the names ensured that the data for each country was correctly combined without technical errors.

It should be noted that the analysis covers only European Union countries for the period 2013–2021. If some indicators were originally presented on a monthly or quarterly basis, they were converted to an annual format by calculating the average value for each year. This was done so that all variables had the same time structure, which allowed them to be correctly compared with each other and used in a single econometric model.

The final dataset was built on the basis of a table with migration indicators. Economic variables were added to it in turn using the left join procedure. This method of combining means that all available observations on migration were retained, even if some economic indicators were missing for certain years or countries. The result was an unbalanced panel, i.e. not every country has a complete data set for all years.

Before evaluating the models, the data was also checked separately to see where and how many gaps there were. If a country had no values for more than three consecutive years for any of the explanatory variables, that country was excluded from the sample. Belgium, Bulgaria, Croatia, Denmark and Romania were excluded according to this rule. For the remaining countries, the gaps were filled in carefully. If data was missing for no more than two consecutive years within a series, the values were restored using linear interpolation. If the gaps were at the beginning or end of the period, the method of carrying the nearest available value forward or backward was used. This

approach made it possible to preserve the logic of changes in indicators over time and not distort the results.

Detailed information on interpolation and forward/backward filling procedures is presented in Appendix A.

To make the indicators of different countries more comparable, income-related variables (GDP per capita, median disposable income and social protection expenditure) were converted to logarithmic form. This helped to reduce the difference in scale between countries and make the distribution of data more uniform.

The dependent variable - annual migrant inflow from Ukraine - was also transformed as $\log(\text{Migration inflow} + 1)$. Adding one allows for cases where the inflow is zero, and the logarithm reduces the impact of very large values.

All explanatory variables were shifted back one year. This means that migration in a given year is explained by the economic conditions of the previous year, as decisions to move are usually made on the basis of already known information.

The theoretical maximum number of observations for 15 countries over the period 2013–2021 is 135 country-year observations ($15 \text{ countries} \times 9 \text{ years}$). The one-year lag structure removes the first year of observations for each country, reducing the sample by 15 observations to 120. An additional four observations were excluded because of missing values in several explanatory variables. As a result, the final estimation sample includes 116 country-year observations.

As a result of the steps taken, the final analytical dataset covers 15 European Union countries: Austria, Czechia, Estonia, Finland, Germany, Hungary, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Slovakia, Slovenia, Spain and Sweden, for the period 2013–2021 and forms an unbalanced panel suitable for econometric analysis.

The sample selection process is presented below (see Table 1).

Table 1. Sample Selection

Step	Reason	Countries
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Initial sample	All EU countries	EU-27
Excluded	Missing migration data	Cyprus, Malta, France, Ireland, Poland, Portugal, Greece
Excluded	Missing economic data (>3 years)	Belgium, Bulgaria, Croatia, Denmark, Romania
Final sample	Data available	Austria, Czechia, Estonia, Finland, Germany, Hungary, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Slovakia, Slovenia, Spain, Sweden

Source: Author's compilation.

4.6 ROBUSTNESS CHECKS

An additional check was performed to ensure that the results were not due to exceptional events in the last years of the sample.

The main fixed effects specification was re-estimated using a limited time period from 2013 to 2019, thus excluding 2020 and 2021. These years coincide with the COVID-19 pandemic, which had a significant impact on labour markets, economic activity and international mobility. Due to quarantine restrictions and border closures, opportunities for relocation were limited, and many businesses operated intermittently or temporarily ceased operations.

As a result, both migration flows and economic indicators may have undergone temporary changes that do not reflect normal migration dynamics. By comparing the results obtained from the restricted 2013–2019 sample with the full 2013–2021 sample, it is possible to assess whether the estimated relationships remain stable when the COVID-19 period is excluded.

The robustness results show that the main relationships are fairly stable. In particular, the positive associations with migration inflows from Ukraine remain consistent with the main findings, in terms of GDP per capita and job vacancy rate.

In addition, two robustness checks were performed by comparing the periods before and after the introduction of the EU visa-free regime for Ukrainian citizens in 2017. This comparison is used to determine if only the migration environment after 2017 is driving the estimated relationships.

The trends are the same in both periods. The positive relationship between the labour demand and migration inflows is relatively stable, and the estimated GDP coefficient is decreasing since 2017. This could indicate that income differences were slightly less important since visa liberalisation lowered barriers to mobility in the European Union.

A further specification check was run with a reduced model with the two primary predictors, GDP per capita and job vacancy rate, using a Hausman test. The test of the random-effects specification was rejected ($p < 0.001$), indicating that the country-specific effects are correlated with the explanatory variables and fixed-effects should be used.

All of these robustness checks add to the trustworthiness and the stability of the empirical findings.

4.7 LIMITATIONS OF THE STUDY

Although the study relies on official international statistics and standard econometric techniques, several limitations should be acknowledged.

First, the analysis is carried out on the country level; thus, the results explain the macro-level cross-country inequalities instead of the process of decision making of individual migrants. The model does not take into consideration individual characteristics, such as age, educational level, family conditions, professional status, or inspirational elements.

Secondly, most of the variables used are national averages, which may be hiding intra-national heterogeneity. As an example, economic factors and job opportunities may differ significantly in different regions, which is particularly evident in large or economically diverse countries.

Third, the article focuses on the economic factors of migration which excludes other important variables like linguistic familiarity, cultural connections, historical connections and network effects

of migration. For example, migration flows may also be influenced by geographical proximity, existing diaspora communities, and established labour migration corridors. Countries such as Poland, Slovakia, Czechia, and Hungary are geographically close to Ukraine, while Italy and Spain had sizeable Ukrainian communities even before 2014. Similarly, Czechia and Poland developed long-standing labour migration channels and work-permit systems during the 2000s. As a result, the model does not cover the entire range of factors that affect migration decisions. In addition, the study focuses primarily on destination-side economic conditions (“pull factors”), while destination-specific responses to shocks originating in Ukraine are not explicitly modelled. A full analysis of push–pull interactions would require a bilateral origin–destination panel framework, which remains outside the scope of this study. In addition, the annexation of Crimea and the beginning of the Donbas conflict in 2014 represent major push factors within the sample period. Although year fixed effects absorb common shocks affecting all destination countries simultaneously, the model does not separately identify origin-side migration dynamics or destination-specific policy responses to the Ukrainian crisis. Another limitation is the introduction of the EU visa-free regime for Ukrainian citizens in June 2017. This reduced the administrative costs of short-term mobility and may have changed migration and registration patterns across destination countries. Although year fixed effects absorb this event as a common shock, they do not capture possible differences in destination-specific responses. The sample period 2013–2021 ends before the February 2022 full-scale invasion of Ukraine. Therefore, the findings reflect primarily economically-driven migration patterns before the large-scale war-related displacement. Post-2022 migration dynamics are qualitatively different and remain outside the scope of this study.

In this regard, the findings should be taken with care. Another limitation is the potential reverse causality between migration inflows and labour market conditions in destination countries. Large inflows of Ukrainian migrants may themselves affect labour demand, vacancy rates, or wages, particularly in smaller economies. Although the explanatory variables are lagged by one year, this approach reduces but does not fully eliminate the possibility of endogeneity. In addition, the study

relies on cluster-robust standard errors with a relatively small number of country clusters (15). In such settings, conventional cluster-robust inference may overstate statistical precision, and therefore the reported p-values should be interpreted with caution. In addition, several explanatory variables in the model are conceptually related and may exhibit relatively high collinearity, particularly among income-related indicators such as GDP per capita, disposable income, purchasing power, and social protection expenditure. Therefore, individual coefficient magnitudes should be interpreted cautiously and primarily as conditional associations within a broader set of correlated economic factors rather than as isolated causal effects. The Employment Protection Legislation (EPL) indicator required a comparatively larger share of interpolated observations because of lower data availability across countries and years. Therefore, the estimated coefficient for this variable should be interpreted with additional caution. Although the results show a relationship between economic conditions in destination countries and migration inflows from Ukraine, they do not provide an exhaustive explanation of individual migration decisions.

Chapter 5. Results

The statistics in Figure 1 show that migration and economic conditions change a lot between countries and over time (Figure 1). For example, the main variable, `log_migration`, has a mean of 7.4. Its values go from 4.6 to 10.4. This substantial variation across countries supports the use of panel-data methods in this study.

The variation in unique values across indicators is attributed to both the data preparation process and the inherent nature of the variables. For instance, institutional indices and labour market regulations often remain constant over several periods, leading to a lower count of unique observations compared to more volatile macroeconomic flows.

In the final sample ($N = 116$), every variable is complete. It is important to understand that having fewer unique values does not mean the data is missing. Instead, it shows that some variables change more slowly than others.

The labour market data also shows a lot of variety. The unemployment rate is between 2.0% and 26.1%, and the job vacancy rate is between 0.4% and 6.2%. This variety is very helpful for the model. It helps us see exactly how changes in jobs affect migration.

Finally, income variables also show enough variation for the analysis. Overall, the data is diverse and good for testing the hypotheses of this thesis.

	Unique	Missing Pct.	Mean	SD	Min	Median	Max	Histogram
<code>log_migration</code>	114	0	7.4	1.5	4.6	7.1	10.4	
<code>log_gdp_lag</code>	114	0	10.8	0.4	10.3	10.7	11.8	
<code>log_income_lag</code>	109	0	0.3	0.0	0.2	0.3	0.3	
<code>log_social_lag</code>	111	0	3.2	0.2	2.8	3.2	3.6	
<code>tax_lag</code>	112	0	42.9	3.8	36.1	42.6	49.6	
<code>unemployment_lag</code>	114	0	7.8	4.1	2.0	6.8	26.1	
<code>vacancy_lag</code>	35	0	1.8	1.0	0.4	1.6	6.2	
<code>epl_lag</code>	26	0	2.4	0.4	1.8	2.5	3.1	
<code>purchasing_power_lag</code>	96	0	31441.1	14083.5	16500.0	27700.0	79000.0	
<code>housing_lag</code>	62	0	8.1	3.0	2.7	8.2	15.9	
<code>inflation_lag</code>	87	0	102.6	3.2	99.0	101.2	113.2	

Figure 1. Descriptive Statistics; Author's calculations based on Eurostat, OECD and World Bank data.

As shown in Figure 2, the average migration from Ukraine to EU countries grew steadily between 2014 and 2019. However, this trend changed in 2020 when the numbers declined, followed by a partial recovery in 2021 (see Figure 2).

The decrease in 2020 was mostly caused by COVID-19 restrictions, which made international travel very difficult. It is important to look at this sudden change because it might affect how economic factors and migration flows relate to each other in the model.

To make sure the results are reliable, the analysis also includes a robustness check. This means I ran the model again without the COVID-19 data to see if the main conclusions stay the same.

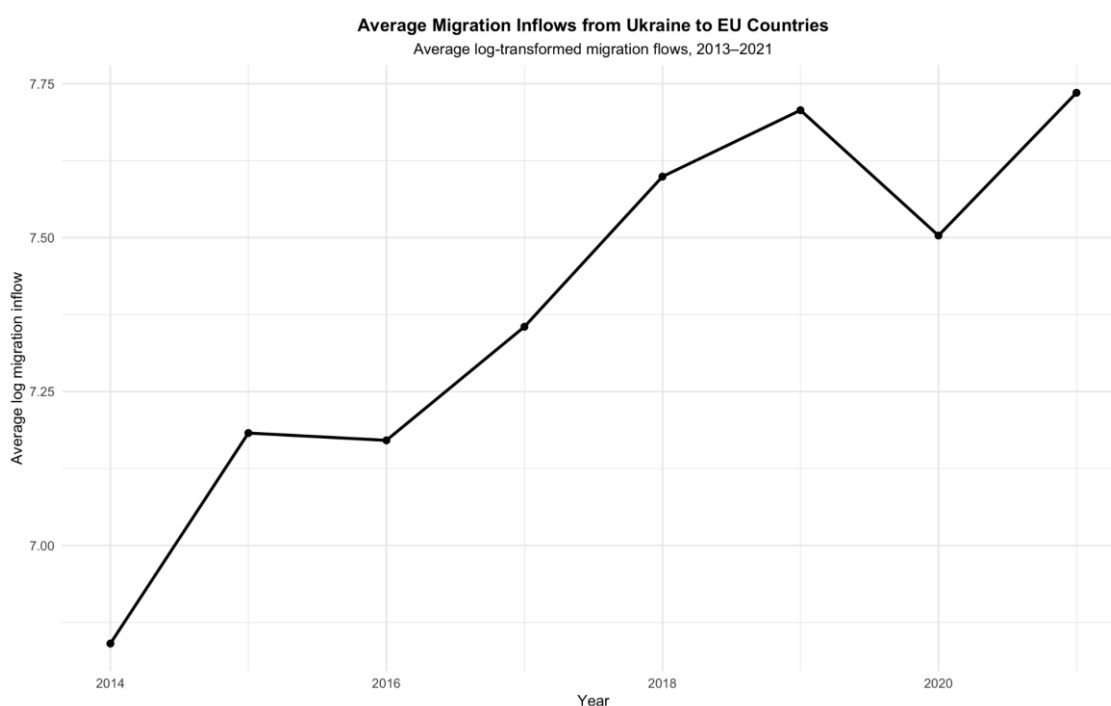


Figure 2. Average migration inflows from Ukraine to EU countries over time; Author's calculations in R based on Eurostat data.

To further evaluate model performance, the predictive accuracy of the LASSO model was assessed on the test sample (2019–2021). The model achieved an RMSE of 1.16 on the hold-out test period. For comparison, a simple baseline model including only GDP per capita and job vacancy rate was estimated. This model achieved an RMSE of 1.39. The relatively similar RMSE values suggest that GDP per capita and vacancy rates capture most of the explainable temporal variation in migration inflows, while additional variables provide only limited improvement in out-of-sample prediction.

Figure 3 shows the main results of the two-way fixed effects (TWFE) regression for the period 2013–2021 (Figure 3). The specification includes both country and year fixed effects, thus ensuring that the estimated coefficients reflect the dynamics of intra-country change over time while holding fixed cross-country differences in structural factors and common shocks to the macroeconomy. Standard errors are clustered at the country level.

Given that the dependent variable is logged, the estimated coefficients can be interpreted as approximate percentage changes in migration inflows. The results show that only income levels and labour demand have a stable and statistically significant association with migration inflows from Ukraine.

The results show that only income level and labour demand have a stable and statistically significant association with migration inflows, while other variables do not exhibit consistent effects. Lagged GDP per capita gets a positive and statistically significant coefficient ($\beta = 6.31$, $p < 0.05$). Since both the dependent variable and GDP per capita are measured in logarithms, the coefficient can be interpreted as an elasticity. Using the exact transformation, a 1 per cent rise in GDP per capita within a country over time is associated with an increase in migration inflows in the following year of around 6.51 per cent, other factors being equal. This estimated elasticity is relatively high compared to many cross-country migration studies, where income elasticities are often closer to 1–2. One possible explanation is that the two-way fixed effects specification captures within-country changes over time after controlling for permanent country characteristics and common year effects. In addition, the model focuses specifically on migration inflows from Ukraine, which may be particularly sensitive to economic differences across destination countries. These findings provide empirical support for Hypothesis 1.

Labour demand, operationalised through the job vacancy rate, also has a positive and statistically significant coefficient ($\beta = 0.49$, $p < 0.01$). The vacancy rate variable is measured in percentage points, with observed values ranging from 0.4 to 6.2 across the sample. Therefore, the estimate implies that a one-percentage-point increase in the job vacancy rate is associated with an

increase in migration inflows of approximately 63 per cent in the following year, holding other factors constant. Although this magnitude appears relatively large, it may reflect the strong responsiveness of migration inflows to labour-demand conditions within the fixed-effects specification. Overall, the results suggest that migrants respond not only to higher income levels but also to signals of labour-market demand, providing support for Hypothesis 2.

On the other hand, other economic variables do not have statistically significant effects in the TWFE specification. Variables such as purchasing power, social protection expenditure, tax wedge, unemployment rate, housing cost overburden, employment protection, inflation and median disposable income produce coefficients indistinguishable from zero. Although some signs are consistent with theoretical expectations, their lack of statistical significance sends a message that short term within country variations in these indicators do not independently explain migration inflows once income levels and labour demand are taken into account. Accordingly, Hypothesis 3 receives limited empirical support, as indicators related to real living conditions and economic stability do not remain statistically significant in the TWFE specification.

The overall R^2 of the model is very high (0.97). However, in a two-way fixed effects model this value is strongly influenced by country and year fixed effects, which absorb a large share of the variation in migration inflows across countries and over time. Therefore, the within- R^2 (0.58) is a more informative measure of how strongly the economic variables explain changes in migration within countries over time. For migration-related panel studies, this still represents a relatively strong explanatory result.

Dependent Variable:	log_migration
Model:	Dependent variable: log migration inflow (1)
<i>Variables</i>	
GDP per capita	6.31** (2.43)
Median disposable income	2.15 (4.54)
Social protection expenditure	-1.55 (0.942)
Tax wedge	-0.181* (0.092)
Unemployment rate	-0.022 (0.049)
Job vacancy rate	0.490*** (0.123)
Employment protection legislation	-0.109 (0.500)
Purchasing power index	-0.0002* (9.71×10^{-5})
Housing cost overburden rate	0.031 (0.030)
Inflation rate	0.029 (0.056)
<i>Fixed-effects</i>	
country	Yes
year	Yes
<i>Fit statistics</i>	
Observations	116
R ²	0.97033
Within R ²	0.58058
<i>Clustered (country) standard-errors in parentheses</i>	
<i>Signif. Codes: ***: 0.01, **: 0.05, *: 0.1</i>	

Figure 3. Main Regression Results; Author's calculations in R.

As shown in Figure 4, the coefficient plot visualizes the estimated effects and their 95% confidence intervals (see Figure 4). Variables whose confidence intervals do not cross zero are statistically significant. The figure confirms that GDP per capita and job vacancy rate have robust positive effects on migration inflows. Other variables display wider confidence intervals overlapping zero, indicating weaker or statistically insignificant relationships. The visual evidence reinforces the conclusion that income levels and labour demand are the dominant economic factors in the model.

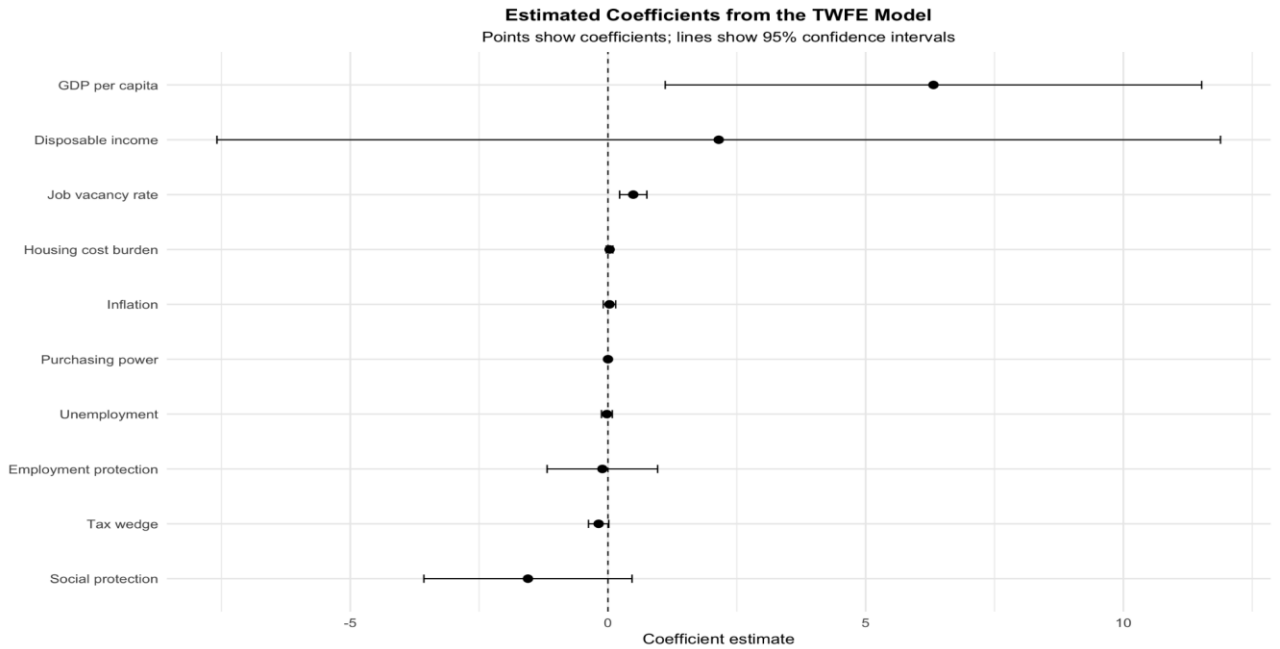


Figure 4. Estimated coefficients from the LASSO-selected two-way fixed effects model; Author's calculations.

The top panel is a summary of the combined relationship between lagged GDP per capita and Ukrainian migration inflows. As shown in Figure 5, the line fitted shows a negative correlation of the cross-section data in a modest way (see Figure 5). On the one hand, this result might seem paradoxical with the panel regression results, but on the other hand, the observed correlation is a manifestation of structural heterogeneity between countries and not intra-country economic processes.

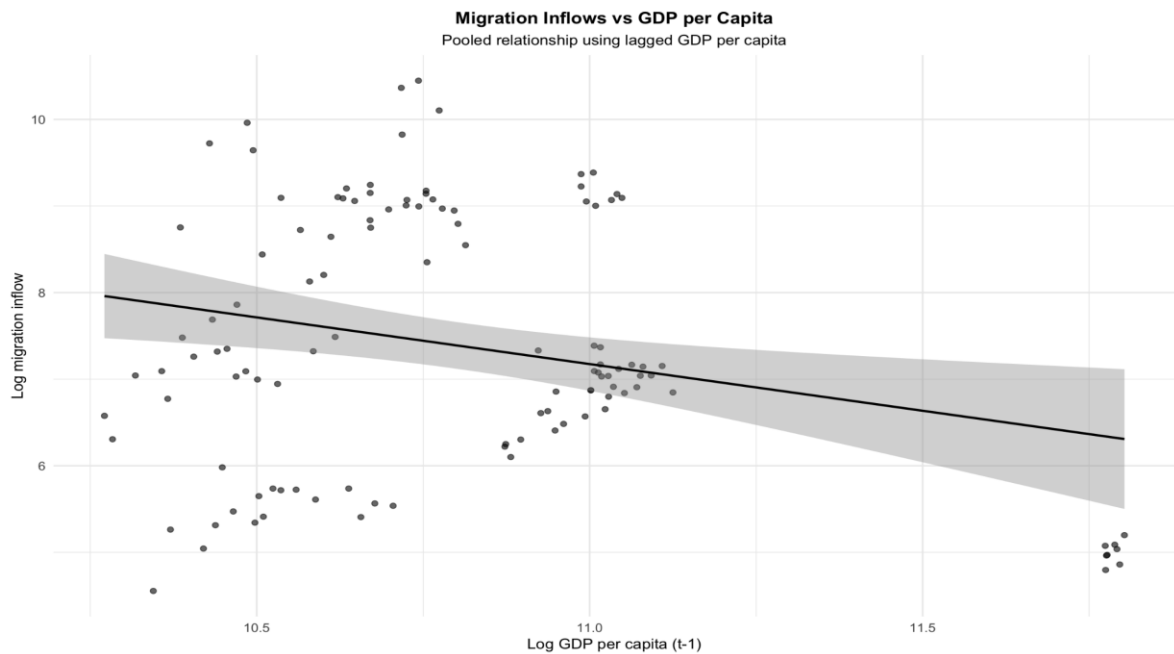


Figure 5. Migration inflows vs GDP per capita (lagged); Author's calculations.

As can be seen, more affluent EU member states have historically received fewer Ukrainian migrants, which can be explained by the higher distance between countries, the existence of an already established network of migration, and the development of a set of preferences towards destinations. On the other hand, there are some middle-income nations, which have comparatively more extensive Ukrainian communities. The negative slope most of the time is therefore pooled and thus reflects cross-country heterogeneity and not the effect of the variation of income over time.

The lower panel depicts within country relationship, which has eliminated country and year fixed effects, thus reflecting the two way fixed effect regression model. As shown in Figure 6, the relationship is purely positive when country-specific traits and shared time shocks have been adjusted (see Figure 6). The positive trend indicates that the growth in the GDP per capita in a specific country is associated with the further growth in Ukrainian migration inflows. This visual data supports the results of the regression analysis and gives strong evidence to Hypothesis 1: higher income levels are associated with higher migration inflows.

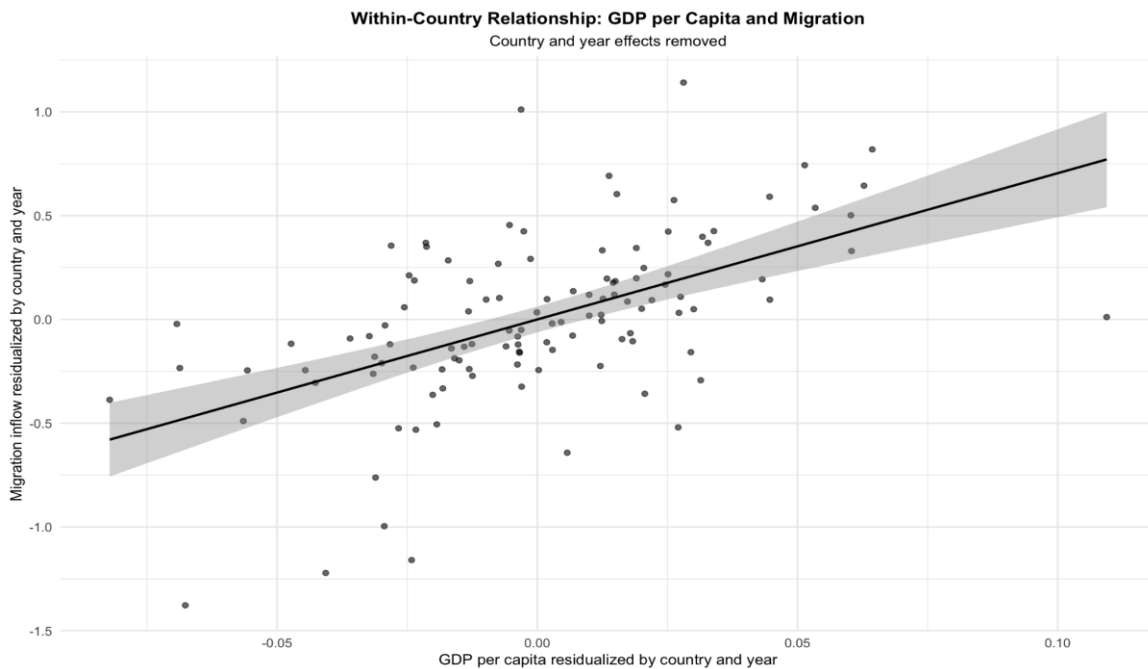


Figure 6. Within-country relationship between GDP per capita and migration inflows (two-way fixed effects); Author's calculations.

The top panel illustrates the summed up correlation between lagged job vacancy rates and inflows of migration. As shown in Figure 7, unlike the GDP scatter, the unconditional association is

positive and the regression line indicates that countries that feature higher labour demand are more likely to receive higher levels of migration inflows (see Figure 7). Therefore, without the adjustments involving the use of fixed-effects, the labour market conditions seem to be closely related to the flows of migration.

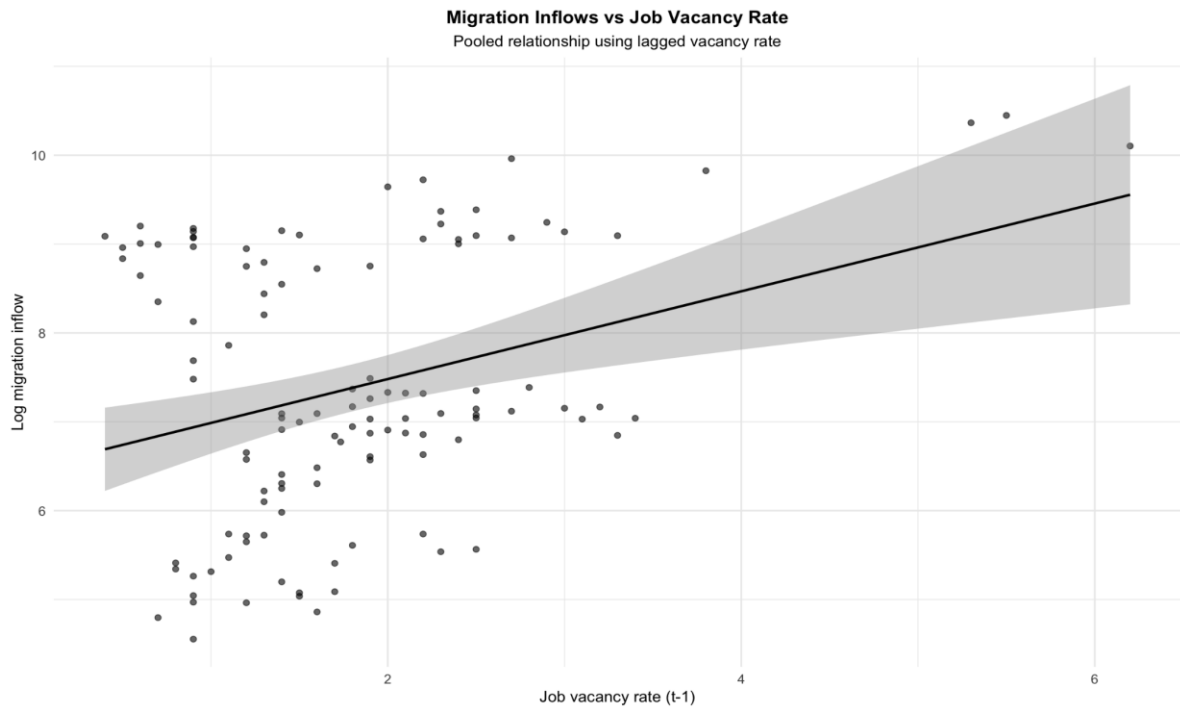


Figure 7. Migration inflows vs job vacancy rate (lagged); Author's calculations.

The relationship is presented in the lower panel having controlled the country and year fixed effects. As shown in Figure 8, the positive slope continues and is consistent with the respective two-way fixed-effects (TWFE) regression estimates (see Figure 8). The modified scatter shows that the time-dependent rise in job vacancy rates within a country is associated with higher migration inflows. The positive relation that persists despite controlling against unobserved heterogeneity supports the interpretation of a stable within-country association rather than a causal relationship.

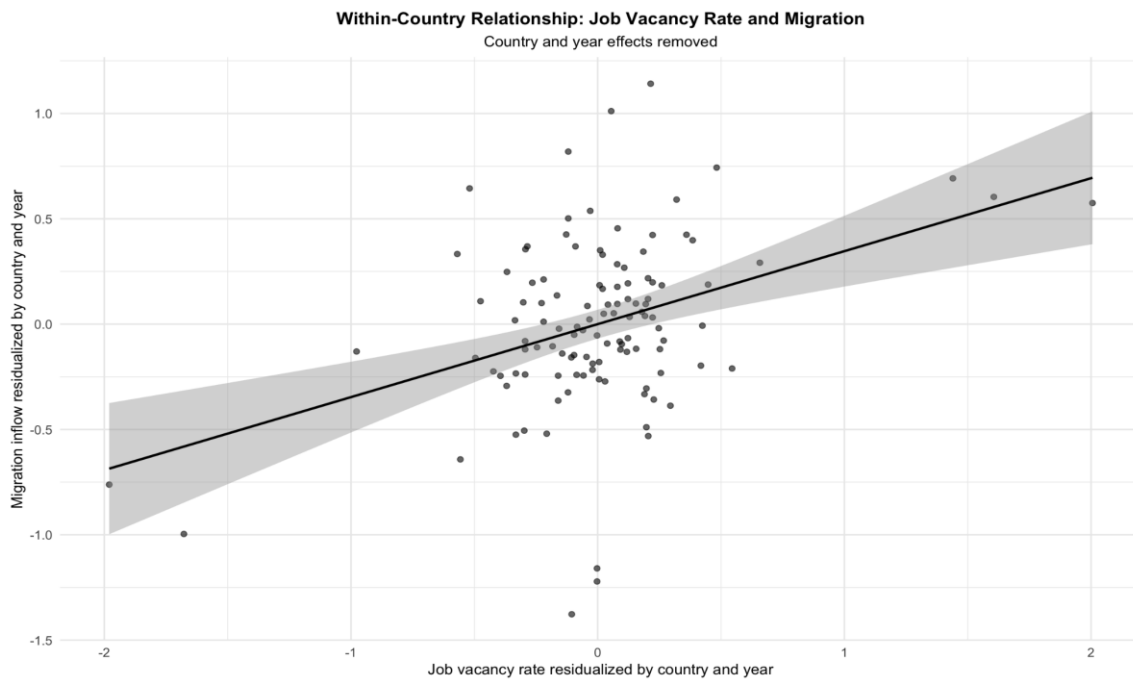


Figure 8. Within-country relationship between job vacancy rate and migration inflows (two-way fixed effects); Author's calculations.

This provides strong empirical support for Hypothesis 2, suggesting that labour demand is a key factor associated with destination choice.

Figure B1 presents the model-implied economic component of predicted migration inflows from Ukraine for each destination country (see Figure B1). The bars show the contribution of individual economic variables relative to the sample mean, expressed in logarithmic points. Positive values indicate that a given factor is linked to higher predicted migration inflows than the cross-country average, while negative values indicate less favourable economic conditions. The figure shows that the influence of economic variables differs considerably from country to country. In most cases, income-related measures and labour market indicators have the strongest effect, although both the magnitude and the direction are variable. Concurrently, many other factors play a modest role, suggesting a reduced role in explaining short term fluctuations of migration flows within individual countries.

These contributions should not be interpreted as causal effects or direct measures of attractiveness, but rather as model-implied relative contributions based on estimated coefficients.

They should be interpreted as relative model-based associations rather than direct measures of attractiveness.

The Table 2 shows a summary of the three most influential variables contributing to the predicted migration inflow for each destination country, and thus allowing a more direct comparison of the main economic drivers across national contexts (see Table 2).

Table 2. Key Factors by Country

Country	Top 1 factor	Value	Top 2 factor	Value	Top 3 factor	Value
Austria	GDP per capita	1.45	Tax wedge	-0.97	Purchasing power	-0.96
Czechia	GDP per capita	0.93	Job vacancy rate	0.83	Purchasing power	-0.77
Estonia	GDP per capita	-1.74	Purchasing power	1.67	Tax wedge	0.74
Finland	GDP per capita	0.66	Social protection	-0.45	Housing cost burden	-0.11
Germany	GDP per capita	1.33	Tax wedge	-1.16	Purchasing power	-0.90
Hungary	GDP per capita	-2.49	Purchasing power	2.00	Tax wedge	-0.71
Italy	Tax wedge	-0.86	Purchasing power	0.61	Social protection	-0.38
Latvia	GDP per capita	-2.53	Purchasing power	2.21	Social protection	0.55
Lithuania	GDP per capita	-1.66	Purchasing power	1.58	Social protection	0.54
Luxembourg	Purchasing power	-8.34	GDP per capita	6.20	Tax wedge	0.76
Netherlands	GDP per capita	1.71	Purchasing power	-1.19	Tax wedge	1.06
Slovakia	Purchasing power	-2.26	GDP per capita	1.84	Job vacancy rate	-0.40
Slovenia	Purchasing power	1.30	GDP per capita	-1.23	Housing cost burden	-0.09
Spain	Purchasing power	0.98	GDP per capita	-0.76	Job vacancy rate	-0.60
Sweden	GDP per capita	1.21	Purchasing power	-0.69	Social protection	-0.35

Source: Author's calculations based on TWFE model estimates.

The results show that income-related factors, in particular gross domestic product per capita, are among the top contributors in a significant number of destinations, supporting the hypothesis that income disparities are a fundamental determinant of migration behavior.

Simultaneously, there is a strong heterogeneity across countries; in some cases migration is associated mainly with high levels of income, while in other cases labour market conditions, such as job vacancy rates and purchasing power, have a more significant association. Luxembourg represents a noticeable outlier in the contribution analysis, combining exceptionally high GDP per capita with very large purchasing-power and price-level effects. This likely reflects the specific economic structure of a small high-income economy rather than a typical migration destination profile. Negative contributions are also salient as they represent factors that reduce the predicted migration inflow compared to the mean of the sample.

Overall, the table emphasizes how the economic dimension of migration is not homogeneous across destinations, but rather, disparate nations attract migrants through dissimilar amalgamations of economic variables.

Qualitatively similar results are obtained for the robustness analysis without the COVID-19 period (2013–2019). Main findings are not associated with pandemic-related disruptions as the coefficient for GDP per capita and job vacancy rate are positive and statistically significant. The level of consistency of the signs, the levels of significance and the magnitudes of the signs within the specifications enhance confidence in the stability and validity of the empirical findings (see Figure 9).

Dependent Variable:	log_migration	
	TWFE 2013–2021	TWFE 2013–2019
Model:	(1)	(2)
<i>Variables</i>		
GDP per capita	6.31** (2.43)	8.72** (3.32)
Median disposable income	2.15 (4.54)	2.26 (4.76)
Social protection expenditure	-1.55 (0.942)	-2.04 (2.15)
Tax wedge	-0.181* (0.092)	-0.144 (0.128)
Unemployment rate	-0.022 (0.049)	-0.013 (0.069)
Job vacancy rate	0.490*** (0.123)	0.406*** (0.130)
Employment protection legislation	-0.109 (0.500)	0.210 (0.426)
Purchasing power index	-0.0002* (9.71×10^{-5})	-0.0001 (0.0001)
Housing cost overburden rate	0.031 (0.030)	0.021 (0.031)
Inflation rate	0.029 (0.056)	0.101 (0.075)
<i>Fixed-effects</i>		
country	Yes	Yes
year	Yes	Yes
<i>Fit statistics</i>		
Observations	116	88
R ²	0.97033	0.97165
Within R ²	0.58058	0.60556

Clustered (country) standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Figure 9. Robustness Checks; Author's calculations.

The periods before and after the EU visa-free regime for Ukrainian citizens was introduced in 2017 are compared in an additional robustness check. The overall trend of the main coefficients is similar in both periods, especially for GDP per capita and the job vacancy rate, which indicates that the results of the main findings are not exclusively linked to the post-2017 migration environment. Concurrently, the estimated GDP coefficient decreases after 2017, suggesting that income disparities were somewhat less important once the obstacles to mobility were eased.

A Hausman test was also conducted with a reduced model, where GDP per capita and job vacancy rate are the key predictors, as an added specification check. The test rejected the random-effects specification ($p < 0.001$), indicating the use of fixed effects and suggesting that country-specific effects are correlated with the explanatory variables.

5.1 HYPOTHESIS SUMMARY

Empirical evidence shows that not all economic factors have the same association with Ukrainian migration to the EU. Some of the variables are identified as core drivers, and others are identified as being of less importance when other stronger factors are kept constant.

Hypothesis 1 is supported. The strongest and most stable result is related to the level of income. Increased migration inflows from Ukraine are correlated to increased migration inflows in the subsequent year, as the GDP per capita increases in a country. The more the GDP per capita of a country increases, the more migration inflows from Ukraine increase, and vice versa. This association is statistically significant, and also economically significant in the fixed-effects setting. Lagged GDP per capita has a positive and statistically significant coefficient ($\beta = 6.31$, $p < 0.05$). Because both the dependent variable and GDP per capita are in log-form, the coefficient is also in the form of an elasticity. Other things equal, for every one per cent increase in the GDP per capita of a given country across time, migration inflows increase by approximately six per cent in the next year. This estimated elasticity is quite high in comparison to the results of many studies of cross-country migration, where income elasticities are generally 1–2. This is because the two-way fixed effects specification accounts for the permanent country attributes and common year effects, thereby accounting for within country changes over time. The model also includes a specific attention for migration movements from Ukraine, which could be sensitive to economic variations between the destination countries.

Hypothesis 2 is confirmed as well. Labour demand is also revealed to be significant and in some respects is even more pronounced. The inflows of migration are statistically significantly related to the rise of the job vacancy rate, indicating migrants are sensitive to job opportunities. The coefficient of labour demand (in terms of job vacancy rate) is positive and statistically significant on the positive side ($\beta = 0.49$, $p < 0.01$). Vacancy rate is reported in percentage points and is between 0.4 and 6.2 in the sample. The estimate thus suggests that a one-percentage-point rise in the job

vacancy rate leads to an increase in migration inflows of some 63 per cent in the subsequent year, *ceteris paribus*. This is a relatively high level, but could be due to the high sensitivity of migration inflows to labour demand in the fixed-effects specification. This correlation is not only observed in the COVID-19 period, but also in other periods, indicating that the relationship is not only due to temporary shocks.

The main TWFE specification does not provide strong support for Hypothesis 3. Indicators related to real living conditions and economic stability do not show statistically significant associations once income and labour demand are controlled for. In the two-way fixed-effects model, there is no statistically significant coefficient on variables like inflation, housing cost burden, purchasing power, social protection expenditure, tax wedge, employment protection legislation, unemployment and median disposable income. This implies that fluctuations in these indicators across countries in the short term are not as well correlated with the migration inflows when income and the demand for labour are controlled.

These results, in combination with the results, indicate that the drive to migrate from Ukraine during the analysed period was primarily driven by economic opportunity, in terms of increased income and stronger labour demand, rather than by a broader welfare context. The results are robust and are not sensitive to changes in model specification, lending support to these findings.

Chapter 6. Findings and Discussion

Empirical results of this research show that economic factors do not have a uniform effect on the decision to migrate from Ukraine; their effects vary in size and importance. The wide array of economic variables included in the econometric specification highlights the importance of a subset of economic factors that seem to have been particularly important in explaining fluctuations in migration flows, meaning that migration decisions are made on the basis of economic cues.

This observation has implications for practice in that it means that there is a possibility of better practice in the future. It implies that prospective migrants think about the economy in the country of destination ad hoc, rather than in an integrated manner. Hence, the emphasis on pragmatic and rational information, with immediate economic opportunities being key.

The best and most consistent correlation is seen with GDP per capita. The model reveals that the increase in a nation's income is followed by an increase in the migration from Ukraine in the next period. Notably, the relationship is only statistically significant with the addition of the country and year fixed effects.

The findings reveal that it would be dangerous to compare across countries in a simple cross-country fashion without accounting for the long-term structural differences in geographic distance, historical connections, or diaspora networks. Once the effects of structural differences across countries have been accounted for, migrants seem to be reacting to both levels of incomes and changes in economic conditions across time in destination countries.

These findings are broadly consistent with previous migration literature emphasizing the importance of income differentials and labour-market conditions in destination choice, including Geis, Uebelmesser, and Werding and Mayda. However, the estimated elasticity in this study is substantially larger, which may reflect the within-country nature of the two-way fixed effects specification.

The second important determinant is the demand for labour, which is indicated by the job vacancy rate. The empirical analysis reveals a positive and significant relationship between vacancy

rates and migration flows indicating the preference for destination markets where there is a higher level of employment.

That this underlying mechanism can be explained as follows. High vacancy rates decrease the perceived risks of moving to another location as it increases the likelihood of acquiring a job. Labour demand is easily observed and easily translated in intuitive terms, which could be the reason it is more strongly and more robustly influential in the specification than other indicators.

There is significant variance between destinations in country specific analyses. While there are clear patterns in the economic importance of migration volumes estimated by the model, the economic importance of the specific factors in this pattern is variable across countries.

In most destinations, income and purchasing power appear to have the strongest association with migration inflows. In certain places, however, labour market conditions are what shape expectations, demonstrating that migrants adjust their expectations based on the economic signals they receive in different countries.

Both positive and negative estimates of the parameters should be interpreted. Negative coefficients do not indicate that there is no in-migration, but indicate that some of the economic conditions are less favorable than they were on average across the country, and thus can provide some information about what factors may encourage in-migration as well as what factors may limit it.

At the same time, the other macro-variables (housing cost, inflation, social spending, etc.) fail to reach statistical significance when fixed effects are controlled for, further supporting the notion that these macro variables are of limited importance to short-run migration dynamics.

The decision to move might take place in a series of phases: the decision to move starts with income and job opportunities, but becomes more focused on quality of life attributes following a move. Furthermore, many of the variables are slowly changing and will lessen the impact of their observable presence in the cross sectional model.

The econometric modelling only reflects the economic aspect of the migration decision-making process, whilst other non-economic factors, including language skills, cultural affinity,

geographical proximity and migrant networks, are not observed, which reduces the explanatory power of the analysis.

The results are strengthened by the fact that they remain unchanged when the pandemic years are excluded, indicating that the relationships are not a product of anomalies brought about by the pandemic.

To sum up, the sources suggest a solid economy base for Ukrainian migration and income, together with the demand for labour, seem to be the most important factors influencing migration trends, with other variables having a minor effect.

Chapter 7. Conclusion

The aim of the present study was to clarify the economic factors related to migration flows from Ukraine to European Union member states. It further aimed to explain the rationale for migrant destination choices. To this end, panel data from the period 2013-2021 were analysed using a fixed-effects model, which is a methodological choice that allows for controlling both the heterogeneity across countries and the temporal dynamics.

Findings indicate that the most pronounced associations are with proximate economic variables - income (GDP per capita) and labour-market conditions (vacancy rate). Notably, higher gross domestic product per capita and a higher vacancy rate in a destination country are positively associated with migration inflows from Ukraine. These results suggest that migration decisions are partly influenced by employment opportunities and expected income levels.

Concurrently, the relative importance of economic variables is heterogeneous. Parameters such as housing costs, inflation rates and social expenditure clearly have little short-term effect. This pattern may suggest that migrants focus on basic economic conditions, i.e. employment opportunities and wage rates, when making initial choices of destinations, but that ancillary considerations may become more important after migration.

Supplementary analyses show that the operationalisation of economic factors differs in national contexts. Although there are broad trends, the key drivers vary from country to country. For example, income levels are dominant in some jurisdictions while labour market dynamics or relative purchasing power are more influential in others. Consequently, migration is not a monolithic phenomenon but is subject to the idiosyncratic economic milieu of each host nation.

However, the study is limited by a number of limitations. Primarily, it only includes economic variables, leaving out salient factors such as linguistic proficiency, cultural affinity and migrant network effects. Additionally, the utilisation of country level aggregates prevents the direct observation of individual level motivations for migration.

Notwithstanding these constraints, the empirical evidence highlights a strong economic basis for Ukrainian migration. Migration flows appear to be closely associated with differences in economic opportunity between Ukraine and EU member states. Accordingly, as long as divergences in income potential and labour demand continue, migration is likely to continue under these conditions.

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APPENDIX A

Table A1. Description of variables

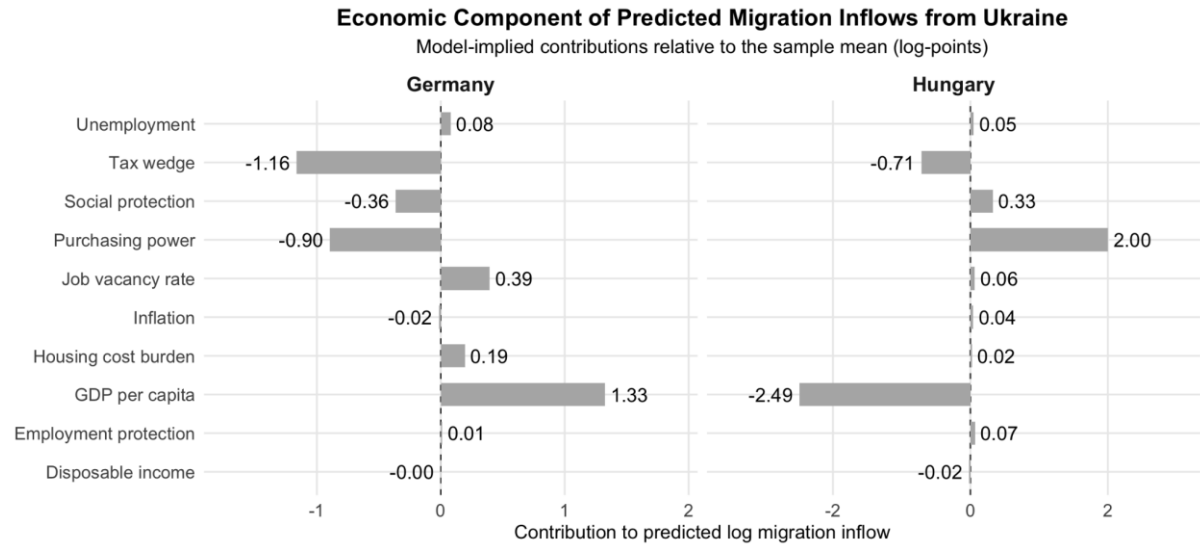
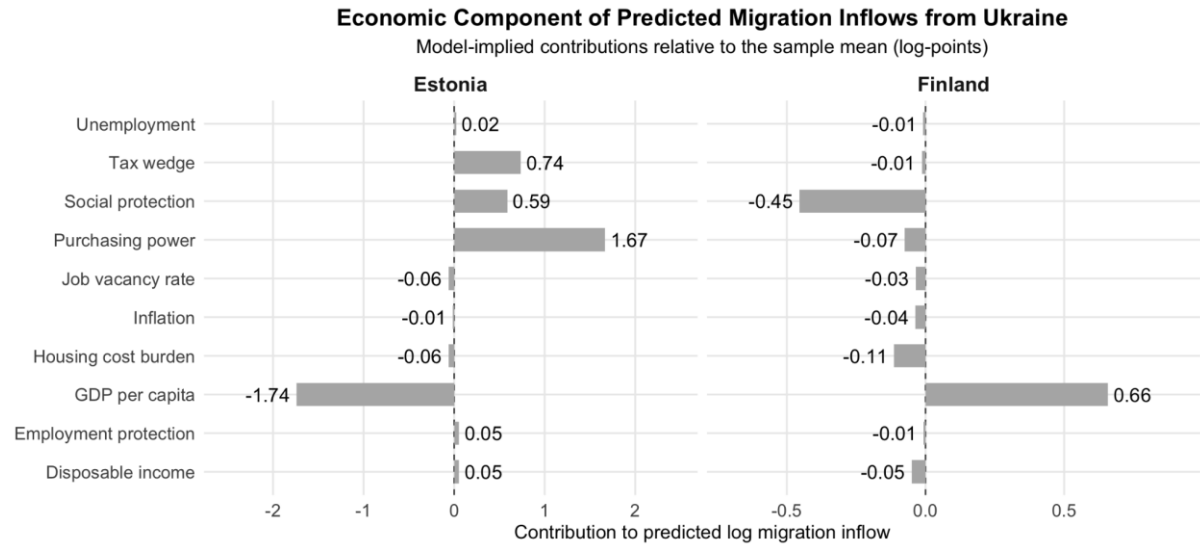
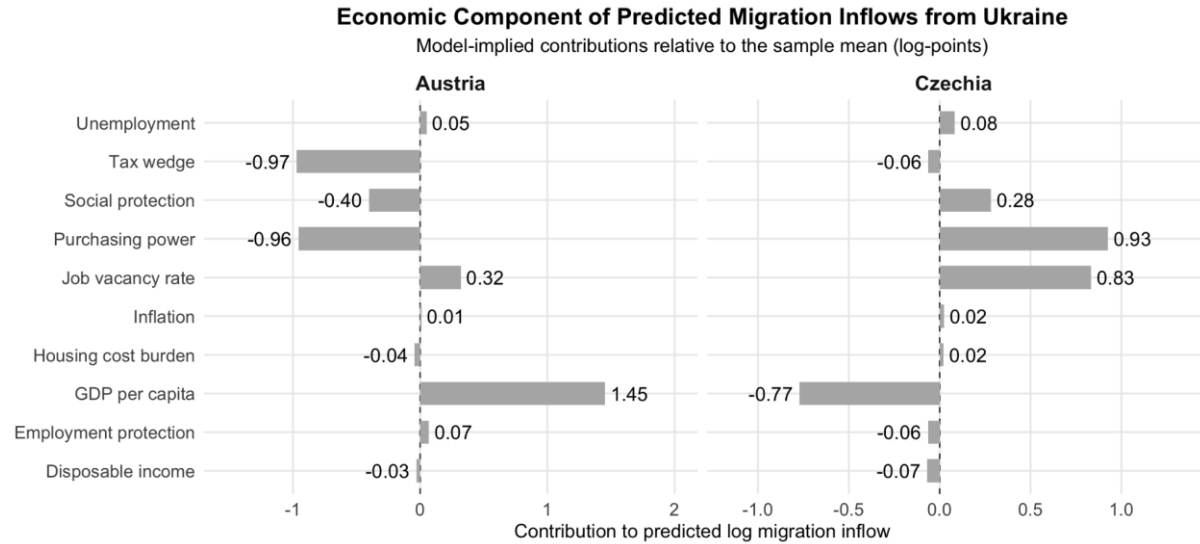
Variable		Variable name	Description	Source
	Dependent variable	ukraine_migration	Annual number of Ukrainian migrants entering an EU country, log-transformed as $\log(\text{Migration inflow} + 1)$.	Eurostat, 2013–2021
	Income and economic attractiveness	GDP per capita	Indicator of the overall level of economic development and income in the destination country.	World bank, 2013–2021
		Median disposable income	Median household income after taxes and transfers, reflecting typical living standards.	OECD, 2013–2021
		Tax wedge	Share of labour costs paid in taxes and social contributions, reflecting net income incentives.	OECD, 2013–2021

Independent variables	Labour market opportunities	Unemployment rate	unemployment_rate	Share of unemployed persons in the labour force, indicating labour market conditions.	World bank, 2013–2021
		Job vacancy rate	job_vacancy_rate	Share of vacant jobs, reflecting labour demand and employment opportunities.	Eurostat, 2013–2021
		Employment protection legislation	employment_protection_legislation	Index measuring the strictness of employment protection and labour market regulation.	OECD, 2013–2021
	Real living conditions	Purchasing power index	purchasing_power_index	Indicator of how much goods and services can be purchased with available income.	Eurostat, 2013–2021
		Housing cost overburden rate	housing_cost_overburden_rate	Share of households spending a high proportion of income on housing.	Eurostat, 2013–2021

	Additional economic indicators	Inflation rate	inflation_rate	Annual change in consumer prices, reflecting changes in the cost of living.	Eurostat, 2013–2021
		Social protection expenditure	social_ protection_ expenditure	Government spending on social protection, reflecting welfare system generosity.	Eurostat, 2013–2021

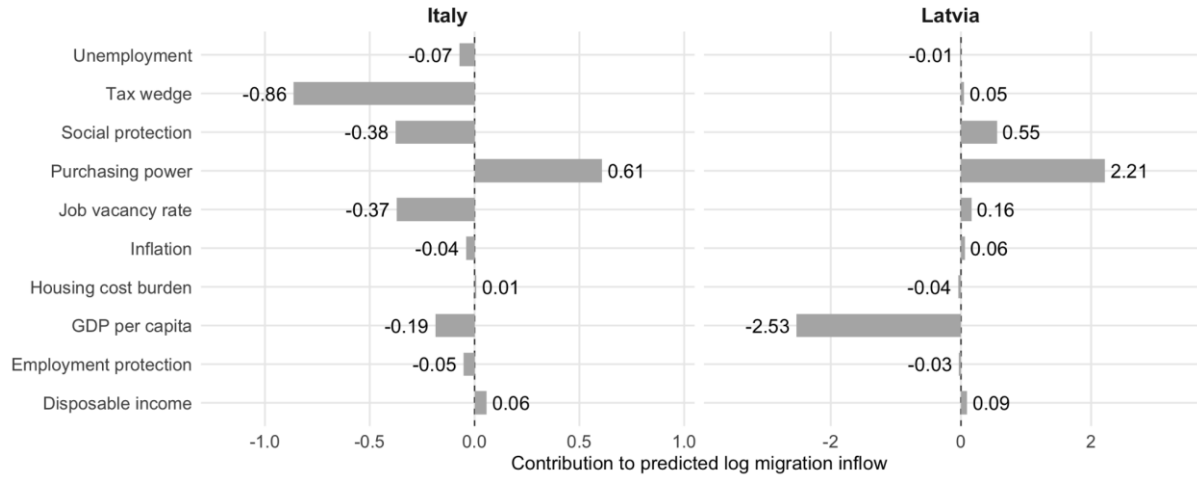
Source: Author's compilation based on Eurostat, OECD and World Bank data.

APPENDIX B



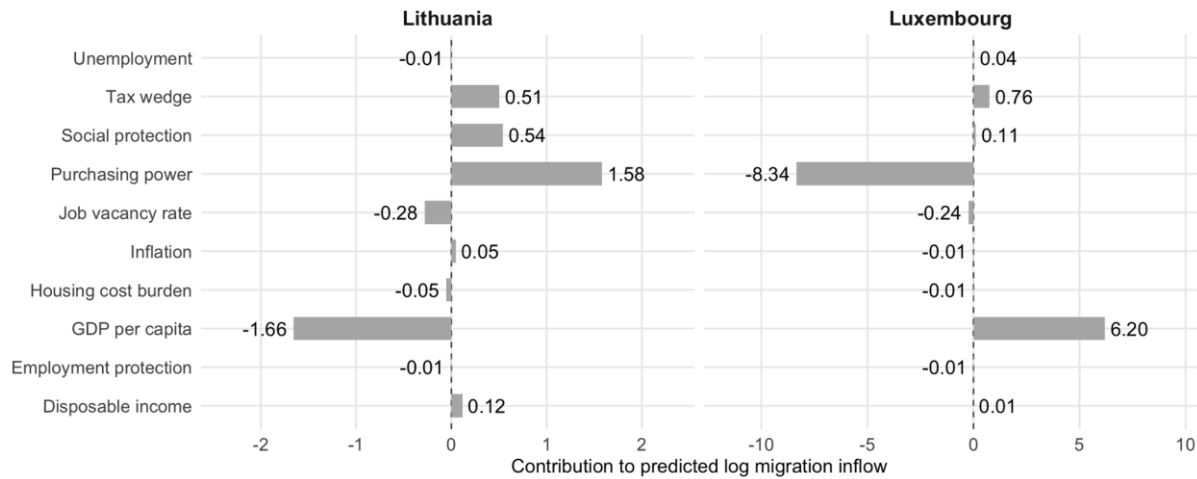
Economic Component of Predicted Migration Inflows from Ukraine

Model-implied contributions relative to the sample mean (log-points)



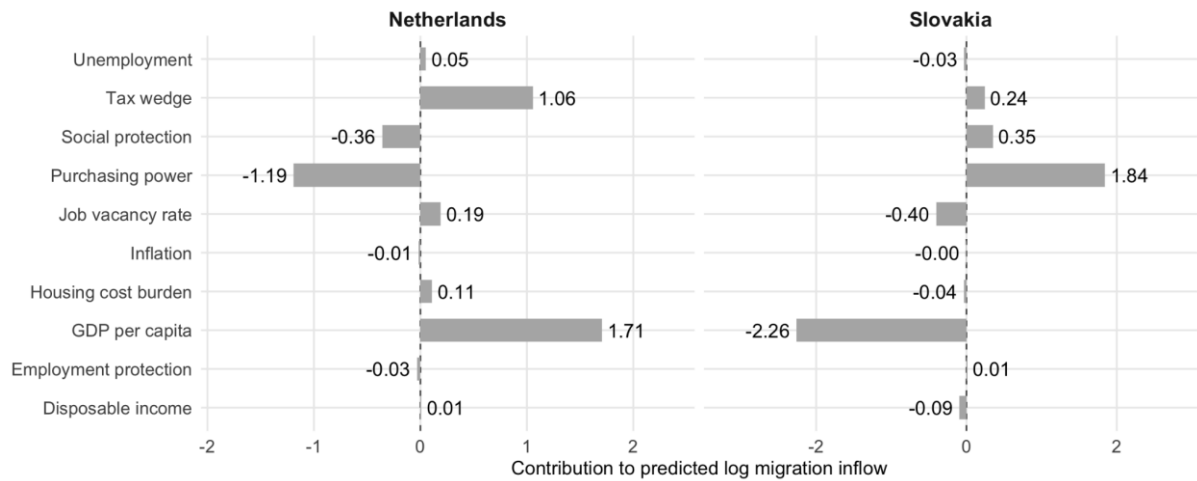
Economic Component of Predicted Migration Inflows from Ukraine

Model-implied contributions relative to the sample mean (log-points)



Economic Component of Predicted Migration Inflows from Ukraine

Model-implied contributions relative to the sample mean (log-points)



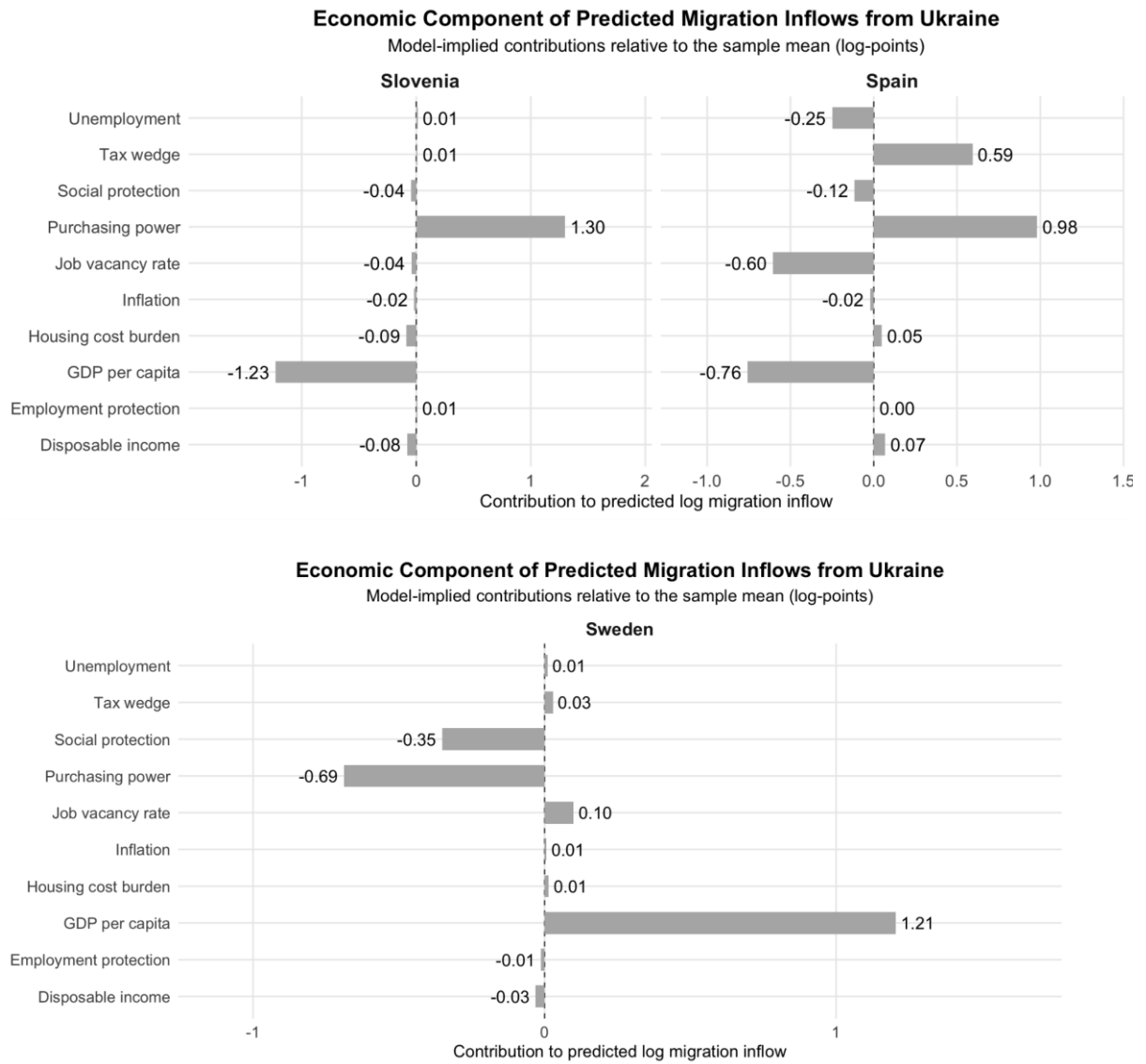


Figure B1. Model-implied economic component of predicted migration inflows relative to the sample mean (in log-points); Author's calculations based on TWFE model estimates.

APPENDIX C

Table C1. Imputation Coverage by Variable

Variable	Total country-years	Observed	Linearly interpolated	Forward/backward-filled	Imputed share (%)
Employment Protection Legislation (EPL)	135	99	25	11	26.7
Housing cost overburden rate	135	116	17	2	14.1
Job vacancy rate	135	125	8	2	7.4
Disposable income	135	126	8	1	6.7
Unemployment rate	135	128	6	1	5.2
Tax wedge	135	128	6	1	5.2
Social protection expenditure	135	128	6	1	5.2
Purchasing power index	135	128	6	1	5.2
Inflation rate	135	128	6	1	5.2
GDP per capita	135	128	6	1	5.2

Source: Author's calculations based on Eurostat, OECD, and World Bank data.

Note: most variables required only limited interpolation and filling procedures. The highest imputation share was observed for the Employment Protection Legislation (EPL) indicator because of lower cross-country data availability.

APPENDIX D

Table D1. Hausman Specification Test

Test	Chi-square	df	p-value
Hausman test	24.97	2	<0.001

Source: Author's calculations based on the reduced fixed-effects and random-effects models.

Note: the Hausman test compares fixed-effects and random-effects specifications using a reduced model with GDP per capita and job vacancy rate as the main predictors. The test rejects the random-effects specification ($p < 0.001$), supporting the use of fixed effects.

APPENDIX E

Dependent Variable:	log_migration		
Model:	Full sample (1)	Before 2017 (2)	After 2017 (3)
<i>Variables</i>			
GDP per capita	6.31** (2.43)	6.53 (4.86)	2.14 (2.46)
Median disposable income	2.15 (4.54)	-11.8 (7.13)	0.878 (6.40)
Social protection expenditure	-1.55 (0.942)	3.76** (1.40)	-3.12** (1.11)
Tax wedge	-0.181* (0.092)	0.128* (0.065)	-0.164*** (0.037)
Unemployment rate	-0.022 (0.049)	-0.039 (0.094)	-0.096 (0.056)
Job vacancy rate	0.490*** (0.123)	0.574** (0.258)	0.543*** (0.083)
Employment protection legislation	-0.109 (0.500)	0.972** (0.430)	-1.92*** (0.504)
Purchasing power index	-0.0002* (9.71 × 10 ⁻⁵)	4.65 × 10 ⁻⁶ (3.22 × 10 ⁻⁵)	-0.0002** (6.34 × 10 ⁻⁵)
Housing cost overburden rate	0.031 (0.030)	-0.022 (0.029)	0.043 (0.043)
Inflation rate	0.029 (0.056)	-0.040 (0.125)	-0.005 (0.033)
<i>Fixed-effects</i>			
country	Yes	Yes	Yes
year	Yes	Yes	Yes
<i>Fit statistics</i>			
Observations	116	43	73
R ²	0.97033	0.99464	0.99073
Within R ²	0.58058	0.65910	0.47655

Clustered (country) standard-errors in parentheses
*Signif. Codes: ***, 0.01, **, 0.05, *, 0.1*

Figure E1 Visa-Free Regime Robustness Check; Author's calculations based on the TWFE model estimates.

Note: the table compares the main TWFE specification across the periods before and after the introduction of the EU visa-free regime for Ukrainian citizens in 2017. The direction of the main coefficients remains broadly stable across both periods, particularly for GDP per capita and job vacancy rate. The estimated GDP coefficient becomes smaller after 2017, while labour demand remains positively associated with migration inflows.