Ines Kersan-Škabić,
Sanja Blažević Burić

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MIGRATION AND EARNINGS IN EMIGRANT AND IMMIGRANT COUNTRIES - THE CASE OF EUROPE

Ines Kersan-Škabić*
Juraj Dobrila University of Pula, Faculty of Economics and Tourism "Dr. Mijo Mirković", Pula, Croatia
E-mail: ikersan@unipu.hr
ORCID 0000-0001-7905-368X
*corresponding author

Sanja Blažević Burić
Juraj Dobrila University of Pula, Faculty of Economics and Tourism "Dr. Mijo Mirković", Pula, Croatia
E-mail: sanja.blazevic@unipu.hr
ORCID 0000-0002-5919-5477

ABSTRACT. Migration flows within Europe intensified after the EU enlargement that enabled easier procedures for finding a job in another country. Among the various effects that migration can have on emigrant and immigrant economies, this paper aims to focus on and quantify the impact of migration flows on income levels in both groups of countries. The research covers the period of 2006-2019 and applies dynamic panel data analysis, the results of which highlight that the number of emigrants has a statistically significant impact on earnings in immigrant countries, while the number of immigrants has no significant effects. On the other hand, migration variables do not indicate a statistically significant impact on the earnings of any household type in the group of emigrant countries, whereas macroeconomic variables have a strong impact.

Introduction

Emigration flows were historically present on the European territory where people were always looking for better living conditions. In some periods, the cross-ocean migrations were dominant, but in the last twenty years, the majority of migration flows have been conditioned by the EU enlargements that happened in 2004, 2007 and 2013. This process was marked by the accession of formerly socialist countries which faced the overarching transition of their economies, societies and institutional structure. The group of new EU member states, i.e., Central and Eastern European countries, is lagging behind in economic development in comparison with the EU15 and other Western European countries (such as Switzerland and Norway). Lower standard of living, difficulties with finding a job and lower salaries are among

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the most common and most present reasons for leaving home countries. EU membership enables free circulation of people and motivates the working-age population in Eastern European countries to consider emigrating to a more highly developed European country.

The issue of internal migration within the EU appears in numerous articles where the authors focus on its different aspects: from the determinants of migration, the role of remittances from emigrant workers in reducing poverty and facilitating economic growth to its effects on convergence, GDP per capita, productivity and the labour market in emigrant and immigrant countries. The majority of articles cover only one or just a few countries, and some of them also observe new EU member states as one "emigration" group and EU15[1], i.e., the old member states, as the "immigration" group.

The aim of our research is to determine the impact of emigration (immigration) flows in Europe on the level of wages (earnings) in emigrant and immigrant groups of countries. Wages are closely connected with the level of productivity and economic growth, i.e., with the countries' economic performance. Nowadays, it also depends on trade and investment policy liberalisation (openness). The determinants of salaries are closely connected with the level of development and success in the world market.

Using panel data analysis, we will analyse the period of 2006-2019 because of the availability of specific data about the level of earnings. European countries are divided into two groups of countries: emigrant and immigrant countries.

The novelty of this research is that it expands the existing research and covers the entire Europe (not just EU member states), considers the impact of migration flows on the earnings separately in emigrant and immigrant countries, and includes the period after the EU enlargement (that gradually enabled more internal mobility) in its quantitative panel data analysis.

The paper is structured as follows. Section 1 presents the theoretical background and literature reviews on migrations and their implications. Section 2 explains the methodology and data, while Section 3 presents the results of the research, including the discussion on the findings and policy recommendations. The last section offers the conclusion.

1. Theoretical background and literature review

The majority of intra-European migration flows are those from new EU member states to the EU15 states. As the EU15 members were afraid of extensive immigrations from Eastern European countries, most of them introduced the so-called transition adjustment period that can last for a maximum of seven years ("2+3+2" formula) during which member states can limit the free movement of workers. Some of the EU15 countries immediately opened their labour market for the employees from new member states (such as Sweden and Ireland) while, on the other hand, Germany and Austria kept a very strict regime until the end of the seven-year period. The concern of the EU15 about huge inflows of foreign workers from the eastern part of Europe is exaggerated (Josifidis et al., 2013).

The impact of migration on the level of salaries (wages) is related to the convergence process. This process can be explained from various aspects. Neoclassical economists focus on the labour/capital ratio in emigrant and immigrant countries. Migration fosters convergence because of quantitative reallocation of workers which causes changes in the capital/labour ratio (Badinger et al. 2004, Barro 2015, Barro and Sala-i-Martin 2004, Bouayad-Agha-Hamouche and Védrine, 2010). Migration inflows will decrease the capital stock relative to workers, and the source country will experience an increase in the capital-labour ratio causing it to catch up

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[1] EU15 includes UK that exited from the EU in January 2020.

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with the destination regions in terms of income per capita (Barro and Sala-i-Martin 2004, Incaltarau et al., 2021). Migration affects changes in the relative supply of production factors (labour to capital) and it may consequently lead to further adjustments at the level of wages, employment and unemployment. On the other hand, the opposite theoretical setting lies in the New Economic Geography (NEG) models. According to NEG, an increase in wages will encourage even larger flows of migrants and thus enforce a cumulative causation mechanism (Baldwin 1999, Krugman 1991). Intensified migrations can favour divergence by supporting the agglomeration of economic activities resulting in a faster growth in the more developed regions and larger internal markets. Due to the confrontation and strong arguments in favour of both approaches, it will be interesting to see if the reduction in the capital/labour ratio will decrease wages in the immigrant countries and, at the same time, if the increase in the capital/labour ratio in emigrant countries will drive the growth of salaries.

The impact of migration can be considered in the short, medium and long term. The change in the supply of labour is the first, short-term effect, reflected in the number of employed and unemployed people (or in employment and unemployment rates). Moreover, emigration leads to remittances received from abroad. In the medium term, changes in wages can be expected depending on the volume of emigrants and their education structure. In the long term, a fundamental adjustment is possible in terms of changes in the economy structure (capital–labour ratio), occupational and social mobility of native workers and immigration of foreign labour (Kaczmarczyk et al., 2020).

Baas et al. (2009) created two general equilibrium models to assess the migration impact, where the first model is based on a nested production function that is suitable for examination of the effects of migration on wages and unemployment. The second model is based on the CGE framework, which is appropriate to calculate the interaction of migration with trade and capital movements. They considered the migration from new EU members (EU8) to the EU15 in the period 2004-2007 and they found significant positive effects of migration on GDP, while the impact on labour markets was small in the short term (decline of wages in EU15, increase of wages in EU8, unemployment rates increase in EU15 and decrease in EU8) and neutral in the long term.

Kureková (2018) researched the impact of migration on economic regional convergence within the EU, focusing on employment and income. By applying the panel data analysis, she found that migration can contribute to reducing disparities in employment rates and income between regions.

Vuksanović Herceg, Herceg and Škuflić (2020) also focused on migration determinants in the enlarged EU and found that the critical value of GDP per capita of a country is 85% of the EU average, as a sort of (invisible) limit above which people are not motivated for emigration. They applied the panel data analysis on 12 new EU member states for the period 2007–2016. This level is not fixed; moreover, with each year of membership it increases by 1.37 percentage points.

Huber and Tondl (2012) also researched the impact of migration on income convergence, employment rates and productivity in the EU NUTS2 regions in the period 2000-2007. Although they found no statistically significant impact of migration on unemployment rates, they did see a positive significant impact on GDP per capita and productivity of immigration regions. At the same time, migration seems to decrease the GDP per capita and productivity in emigrant regions, and thus contributes to the divergence and not convergence in economic development between EU regions.

Manole, Păunoiu and Păunescu, A. (2017) also employed the panel data analysis (fixed effect) to examine the impact of migration in the period 2008-2014 on GDP per capita (in relation to the EU average; EU=100) of immigrant countries in the EU28. They found a positive

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and significant impact of migration on economic development (an increase in the number of migrants by 100,000 leads to an increase in the GDP per capita of the receiving country by 0.838% compared to the EU28 average).

Noja et al. (2018) examined the economic effects of migration on the host countries' economies by including the variables: GDP per capita, GDP per person employed, employment and unemployment rates, earnings and earnings dispersion, at-risk-of-poverty rate, educational attainment and participation rates, and life expectancy. They made an analysis of the period 2000-2019 and found "labour immigration has significant positive economic effects, leading to important increases in GDP per capita levels, especially in the long term (0.278 estimated coefficient for IMIG, extremely statistically significant at 0.1% level in the 2000–2015 sample and 0.297 significant at a level of 1% for 2000–2019).

Franc et al. (2019) carried out a panel data analysis of migration determinants in the period 2000–2017 within the EU, between East and West member states. They found that emigration quickly brought about changes in the GDP p.c. and in the (un)employment rate of the youth population in the immigrant country, with statistically significant elasticity coefficients, suggesting that international migration contributes significantly to adjusting the labour supply to fluctuations in economic activity.

Sardadvar and Vakulenko (2021) discussed the interplay between regional human capital endowments and migration as the main determinants of human capital accumulation in the new EU member states. They explained the migration's determinants and then they performed an econometric analysis and found a positive impact of net-migration on regional human capital growth rates, but the effect of international migrants' skill levels is weak. In that way net-migration can contribute to the improving of the economic potential of thriving regions but possibly increasing disparities within countries.

Docquier et al. (2010) provided an analysis of the migration of highly- and low-skilled migrants on the wages in the emigrant countries in the long term. They employed aggregate data for the period 1990-2000 and focused their research on Europe. They found that European countries experienced a drop in their average wages due to emigration, whereas immigration had a positive effect on average wages and reduced wage inequality of non-movers. This unexpected result can be explained by the fact that migrants are more educated relative to non-migrants and immigrants are partly substitutes for non-migrants bringing skills that can partially compensate the losses due to emigration. Similarly, Škuflić and Vučković (2018) researched the impact of emigration on unemployment rates in the emigrant countries. Using panel data analysis, they focused their research on nine EU member states in the period 2004-2015. Contrary to expectations, the findings indicate that emigration increases unemployment rates in those countries. The explanation lies in the structural issues in the labour market caused by emigration, i.e. an increase in the labour supply and demand mismatch. Zaiceva (2014) used descriptive statistics and found that emigration influenced the increase in wages of stayers and decreased unemployment rates in new EU member states, but that it could also cause a skills shortage in certain sectors. Elsner (2012) focused his research on the migration wave after EU enlargement in 2004, including the cases of Lithuania, the UK and Ireland. He applied the structural factor demand model and found that, during the five years immediately after EU enlargement, emigration increased the wages of young workers by 6%, without impacting the wages of older workers. He also did not find any significant effect of emigration on wage distribution between highly- and low-skilled workers. In another paper, Elsner (2013) found that an increase of 1% in emigration in Lithuania (where 9% of people emigrated to Western European countries) would increase the real wages of stayers by 0.67%. The limitation is that the effect is only statistically significant for men. D'Amuri et al. (2010) researched the impact of immigration on wages in Western Germany for the period 1992-2001 and found that

immigration raised less-educated workers' wages by 1.68% and lowered the wages of highly educated workers by 1.01%. On the other hand, Bonin (2005) found that immigration lowers native wages, where a more negative effect is seen in low-skilled workers. In the case of UK, Dustmann et al. (2005) found (for the period 1983-2000) that immigration had a statistically insignificant impact on the wages of each skill group, while in a more recent paper, Dustmann et al. (2013) found (for the period 1997-2005) that immigration lowered wages at the fifth and tenth percentiles and raised average and median wages also in the UK.

Clark et al. (2007), Lewer and Van den Berg (2008), Lewer et al. (2009), Ortega and Peri (2009) and Mayda (2010) included GDP per capita (in the source and/or destination country) as a key determinant of cross-country immigrant flows. In addition, some authors include income inequality as a migration determinant: Borjas (1987), Chiswick (1999), Stark (1991) and Rotte and Vogler (1998).

Judging from this review, the area of migration effects on the earnings of different household types has not been sufficiently explored and our research will focus on that issue.

2. **Methodological approach**

For the analysis, we selected 31 European countries with a longer time-series sequence of data on annual net earnings and migration. We covered the period between 2006 and 2019 (annual, seasonally adjusted data). The period was selected based on the availability of data for as many European countries as possible that we wanted to cover with the research. The countries included in our analysis are: Austria, Belgium, Bulgaria, Croatia, the Czech Republic, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom. Since our main goal was to analyse the effect that immigration and emigration trends could have on annual earnings, we divided the countries into emigrant and immigrant countries according to the differences between the numbers of emigrants and immigrants (net migration rate). If the net migration rate throughout most of the observed period is positive, the country is characterised as an immigrant country. If the net migration rate throughout most of the observed period is negative, the country is characterised as an emigrant country. For Estonia, Greece, Portugal and Ireland, the results regarding the net migration rate for the observed period are ambiguous.

For Estonia, the average net migration rate is positive, but the trend in Estonia has changed since 2015, when Estonia transitioned from an emigration to an immigrant country, so we placed Estonia in both groups. In Greece, the net migration rate is negative, but as they have had a strong immigration trend since 2016, it is also classified in both groups. In Ireland, the net migration rate is positive, but as they had strong emigration flows at the time of the recession, Ireland is also classified in both groups of countries. In Portugal, the net migration rate is negative, but as the net migration rate has shown strong growth since 2017, it is placed in both groups of countries.

Some countries showed a short-term, most often recession-induced, negative trend in migration flows, but due to their short-term nature and relatively small numbers, we left them among the immigrant countries. This applies to the Czech Republic, Spain and Cyprus. This would mean there are 25 immigrant countries and 10 emigrant countries, with four countries being in both groups given the ambiguous results on the direction of migration trends over the observed period.

Our main variables of interest are net migration rates (independent variables) and earnings (in PPP) for six different household forms (dependent variable) which includes the following household forms:

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(1) single person without children earning 50% of the average earnings,
(2) single person without children earning 100% of the average earnings,
(3) single person without children earning 167% of the average earnings,
(4) one-earner couple with two children earning 100% of the average earnings,
(5) two-earner couple with two children, both earning 100% of the average earnings and
(6) two-earner couple without children, both earning 100% of the average earnings.

The Figures 1 and 2 (in Appendix) show cross-country variations of the chosen variables separately for immigrant and for emigrant countries. There are some common characteristics but also differences between countries. Some countries have stable net migration flows: Belgium, Czechia, Denmark, Luxembourg, Hungary, Slovakia, Finland, Iceland; some counties faced huge fluctuation: Germany (reaches the peak in 2015 due to the high migration from Syria); Spain, France, Italy, Austria, Netherlands, Sweden, Switzerland, UK. In majority of countries, the household type "two-earner couple with two children, both earning 100% of the average earnings" reaches the highest earnings while the form "single person without children earning 50% of the average earnings" has the lowest earnings in the immigrant countries.

In emigrant countries, net migration flows are stable in Bulgaria, while in other countries the migration flows are more flexible. The earnings types have the same (comparable) order but at lower value levels.

3. Research and results

Given the theoretical framework of potential factors that can influence earnings, we selected six dependent and 10 explanatory variables for our analysis for the empirical model (Table 1).

Table 1. Variables for the empirical model

Time period	2006-2019	
Frequency	Annual	
Dependent variables for different model specifications	Net earnings of a single person without children earning 50% of the average earnings (in PPS)	*earn1*
	Net earnings of a single person without children earning 100% of the average earnings (in PPS)	*earn2*
	Net earnings of a single person without children earning 167% of the average earnings (in PPS)	*earn3*
	Net earnings of a one-earner couple with two children earning 100% of the average earnings (in PPS)	*earn4*
	Net earnings of a two-earner couple with two children, both earning 100% of the average earnings (in PPS)	*earn5*
	Net earnings of a two-earner couple without children, both earning 100% of the average earnings (in PPS)	*earn6*
Independent variables	Emigration (absolute number)	*emigr*
	Immigration (absolute number)	*immigr*
	GDP growth rate (%)*, current and lagged	*gdp* *gdp (-1)*
	Inflation, consumer prices (%)*, current and lagged	*Infl* *infl(-1)*
	Foreign direct investments, net inflows (% of GDP)*, current and lagged	*fdi*
	External balance of goods and services, current prices (million €)	*ext*
	Employed (15-64) with upper secondary and post-secondary non-tertiary education – levels 3 and 4 (% of total employment)	*educ_sec*
	Employed (15-64) with tertiary education – levels 5 to 8 (% of total employment)	*educ_tert*
	Employment rate (%), current and lagged	*emp*

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	emp(-1)
Unemployment rate (%), current and lagged	*unemp*
	unemp(-1)

Source: Authors.

Database: Eurostat; World Bank - World Development Indicators*

When taking into account the effect of different predictor variables, x_1, x_2,…, x_n, on net earnings Y, the following panel data model is established, shown as in Eq. 1:

$$Y_{it} = \beta_0 + \beta_1 Y_{it-1} + \beta_2 emigr_{it} + \beta_3 immigr_{it} + \beta_4 gdp_{it} + \beta_5 gdp_{it-1} + \beta_6 infl_{it} + \beta_7 infl_{it-1} + \beta_8 fdi_{it} + \beta_9 fdi_{it-1} + \beta_{10} ext_{it} + \beta_{11} ext_{it-1} + \beta_{12} educ\_sec_{it} + \beta_{13} educ\_tert_{it} + \beta_{14} emp_{it} + \beta_{15} emp_{it-1} + \beta_{16} unemp_{it} + \beta_{17} unemp_{it-1} + \mu_{it} + \varepsilon_{it}$$

(1)

Wherein, the dependent variable Y represents net earnings of different types of households for the selected country *i* while the subscript of *t* represents the corresponding year. β_1, $\beta_{2,...,}$ β_{17} are the parameters to be estimated using the AB panel data model, μ_{it} is the country-specific effects, and ε_{it} is the error term.

The same model is applied to both group of countries, emigrant and immigrant countries.

The tables 2 and 3 (Appendix) show a descriptive statistic of dependent and independent variables for both groups of countries.

We conducted stationary tests (Levin-Lin-Chu and Im-Pesaran-Shin) for all the variables (Table 4) and, in the case of a given non-stationarity, we used the first differenced variables. We also tested independent variables for possible multicollinearity since we wanted to include some other possible independent variables – share of immigrants/emigrants in the total population and Worldwide Governance Indicators[2] as institutional variables. Since these former variables were highly correlated, they were excluded from the model.

Table 4. Stationary Tests' (Levin-Li-Chu and Im-Pesaran-Smith) Results

Variable	LLC test	IPS test	Final variable for the model
earn1	I(1)	I(1)	*d.earn1*
earn2	I(1)	I(1)	*d.earn2*
earn3	I(1)	I(1)	*d.earn3*
earn4	I(1)	I(1)	*d.earn5*
earn5	I(1)	I(1)	*d.earn6*
earn6	I(1)	I(1)	*d.earn7*
emigr	I(1)	I(1)	*d.emigr*
immigr	I(1)	I(1)	*d.immigr*
gdp	I(0)	I(0)	*gdp*
infl	I(0)	I(0)	*infl*
fdi	I(0)	I(0)	*fdi*
ext	I(0)	I(0)	*ext*
educ_sec	I(0)	I(1)	*d.educ_sec*
educ_tert	I(0)	I(1)	*d.educ_tert*
emp	I(1)	I(1)	*d.emp*
unemp	I(0)	I(0)	*unemp*

Source: Authors.

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[2] Voice and Accountability; Political Stability and Absence of Violence; Government Effectiveness; Regulatory Quality; Rule of Law; Control of Corruption

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For two groups of countries – immigrant and emigrant countries - a dynamic panel-data model was created and used to estimate the parameters of the Arellano-Bond model (with standard errors and robust standard errors). We have also tested (post-tests) the assumptions of our model i.e. the validity of its set of instruments using the Arellano-Bond Test for Zero Autocorrelation in First-Differenced Errors.

The results with statistically significant independent variables and their direction of the effect on each dependent variable are shown in the following tables, while summary tables can be found in the appendix.

Table 5. Results for immigrant countries

	Unambiguous conclusion		Ambiguous conclusion	
	Significant independent variable	Effect	Significant independent variable	Effect
Net earnings of a single person without children earning 50% of the average earnings (in PPS)	Lagged dependent variable	+	Number of emigrants	+
	Employed with tertiary education (% of total employment)	-	Employed with upper secondary and post-secondary non-tertiary education (% of total employment)	-
Net earnings of a single person without children earning 100% of the average earnings (in PPS)	Lagged dependent variable	+	Number of emigrants	+
	Employed with tertiary education (% of total employment)	-	Employment rate (%)	+
Net earnings of a single person without children earning 167% of the average earnings (in PPS)	Employment rate (%)	+	Number of emigrants	+
			Net inflows of FDI (% of GDP)	+
			External balance of goods and services	-
			Employed with tertiary education (% of total employment)	-

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	Lagged unemployment rate (%)			
Net earnings of a one-earner couple with two children earning 100% of the average earnings (in PPS)	Lagged dependent variable	+	Number of emigrants	+
	Employed with tertiary education (% of total employment)	-		
Net earnings of a two-earner couple with two children, both earning 100% of the average earnings (in PPS)	Lagged dependent variable	+	Number of emigrants	+
	Employed with tertiary education (% of total employment)	-	Employment rate (%)	+
Net earnings of a two-earner couple without children, both earning 100% of the average earnings (in PPS)	Lagged dependent variable	+	Number of emigrants	+
	Employed with tertiary education (% of total employment)	-	Employment rate (%)	+

Notes: *An unambiguous conclusion is below the significance level of 0.05 (with normal and robust standard errors). An ambiguous conclusion is below the level of significance of 0.05 taking into account only robust standard errors which are different from the results with standard errors.*
Source: *Author's own compilation.*

Table 6. Results for emigrant countries

	Unambiguous conclusion		Ambiguous conclusion	
	Significant independent variable	**Effect**	**Significant independent variable**	**Effect**
Net earnings of a single person without children earning 50% of the average earnings (in PPS)	GDP growth rate (%)	+	Net inflows of FDI (% of GDP)	-
			External balance of goods and services	-
Net earnings of a single person without children earning 100% of the average earnings (in PPS)	GDP growth rate (%)	+	Net inflows of FDI (% of GDP) – current	-
			Net inflows of FDI (% of GDP) - lagged	+
			External balance of goods and services	
				-

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Net earnings of a single person without children earning 167% of the average earnings (in PPS)	-		-	
Net earnings of a one-earner couple with two children earning 100% of the average earnings (in PPS)	-		Net inflows of FDI (% of GDP) – lagged	+
			Employed with upper secondary and post-secondary non-tertiary education (% of total employment)	+
Net earnings of a two-earner couple with two children, both earning 100% of the average earnings (in PPS)	-		Net inflows of FDI (% of GDP) – current	-
			Net inflows of FDI (% of GDP) – lagged	+
			Employed with upper secondary and post-secondary non-tertiary education (% of total employment)	+
Net earnings of a two-earner couple without children, both earning 100% of the average earnings (in PPS)	GDP growth rate (%)	+	Net inflows of FDI (% of GDP) – current	-
			Net inflows of FDI (% of GDP) - lagged	+
			External balance of goods and services	-

Notes: *An unambiguous conclusion is below the significance level of 0.05 (with normal and robust standard errors). An ambiguous conclusion is below the significance level of 0.05 considering only robust standard errors that are different from the results with standard errors.*
Source: *Author's own compilation.*

The detailed results for every specific household type can be find here.
The results show that there are differences between European immigrant and emigrant countries. In terms of the statistical importance of variables, considering both standard and robust standard errors in immigrant countries, the effect is unequivocal for earnings from the previous year and employees with tertiary education as a percentage of total employment (except for a single person without children earning 167% of average earnings).
In the current year, earnings increased between 18 and 24 PPS annually in all types of households, except in case of a single person without children earning 167% of the average earnings, if their salary in the previous year increased by 100 PPS, which is a practically negligible value.
The number of employees with tertiary education (as a % of total employment) shows a negative impact on earnings, with the greatest impact on households with a two-earner couple with two children or without children, both earning 100% of the average earnings, where an increase in the number of employees with tertiary education by 1 percentage point reduces the earnings by 177 PPS per year. The smallest, but also negative impact of this variable on the annual net earnings concerns a single person without children earning 50% of the average

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earnings with a value of 50.93 PPS if the number of employees with tertiary education rises by 1 percentage point.

A positive impact of earnings in the previous period on current earnings is expected due to the positive expectations of employers and workers. The increase in the number of employees with tertiary education has shown a negative impact on the earnings in all types of households, but it should be borne in mind that there are people with all levels of education in households covered by the research. The increase in the number of employees with tertiary education can mean competition, meaning those with a lower level of education might have their earnings reduced, and the partial impact is certainly reflected in the saturation of the labour market with people with tertiary education, where the earnings of highly educated people stagnate. The average nominal wages of persons with secondary and tertiary education follow the same trend. According to Eurostat, the average annual growth rate of mean equalised net income for the period 2007-2019 for our observed immigrant countries is 2.26% for employees (18 to 64 years) with tertiary education, while for the employees with secondary education it is 2.54% (average inflation rate for the same period is 1.55%). There is heterogeneity among countries i.e., in some countries, the income trend is positive, while it is negative or stagnant in others, but, in the end, we can say that this is a summary stagnant trend for earnings in real terms.

Regarding the migration variables, the number of emigrants indicates a statistically significant impact on earnings in immigrant countries, taking into account robust standard errors. As the model shows, based on valid post-testing using the Arellano-Bond method for zero autocorrelation in first-differenced errors, we can rely on the obtained results. An increase in the number of emigrants by 100,000 in immigrant countries (average annual number of emigrants is 96,435 and the maximum number is 737,889 in the observed period, see table 2) increases current earnings from 94 PPS (single person without children earning 50% of average earnings) to 402.46 PPS for a two-earner couple without children, both earning 100% of the average earnings.

The number of immigrants did not prove significant in any type of household. It can be assumed that the emigration of people from traditionally immigrant countries represents a brain drain. In all of the 25 immigrant countries observed, according to IAB data for 2000, 2005 and 2010, the emigration rates of the highly educated exceed the emigration rates of those with secondary education, while in several countries the emigration rates of the low educated exceed the emigration rates of the highly educated, i.e. in Ireland, Spain and Slovenia in all the three years observed, while in Germany, Italy and Portugal in two observed periods and in Cyprus in one year only. Since extensive emigration can result in labour shortages, immigrant countries or highly developed countries could raise wages for the highly educated in order to retain those domicile workers.

Also, the employment rate can be singled out, taking into account robust standard errors, with a statistically and practically significant positive impact on earnings, i.e. the highest impact is for a two-earner couple without children, both earning 100% of the average earnings with 411.31 PPS due to an increase in the employment rate by one percentage point.

In emigrant countries, migration variables do not indicate a statistically significant impact on earnings of any household type, whereas the macroeconomic variables do have a strong impact, such as the growth rate of gross domestic product, net inflows of foreign direct investments (as a % of GDP) and the external balance of goods and services. GDP growth is expected to have a positive impact, being the most pronounced for earnings of two-earner couples without children, both earning 100% of the average earnings with an increase of one percentage point in GDP increasing wages by 105.17 PPS annually.

Considering robust standard errors, a positive effect is seen of net inflow of FDI in the previous period, but a negative effect in the current period. Given that FDI differently affects

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specific activities and employee structures with regard to the level of education and skills that we did not differentiate in the model and given the positive expectations from investments from the previous period and also changes in the current period, the difference between the direction of impact between the previous and the current net inflow of GDP can be explained.

An increase of the external balance of goods and services, i.e. increased international trade, negatively influences the earnings of some of the selected household types, but its practical significance is quite negligible. However, that negative effect can also be explained with the argument that international trade benefits some workers and not others, but since we did not differentiate earnings according to certain criteria (education, gender, activities) in our model, in certain types of households, a negative result is understandable.

For some household types in emigrant countries, the increase in the number of employees with upper secondary and post-secondary non-tertiary education positively affects earnings, which leads to a conclusion (direction of effect) different from that for the immigrant countries. This can be explained by different trends in income growth between emigrant and immigrant countries. According to Eurostat, the average annual growth rate of mean equalised net income for the period 2007-2019 for the emigrant countries we have observed is 4.86% for employees (18 to 64 years) with tertiary education, while for the employees with secondary education it is 5.13% (average inflation rate for the same period is 1.54%). Average income growth is much higher in emigration than in immigrant countries, so we can expect a positive effect between the number of employees with secondary or tertiary education and earnings in emigrant countries.

The neoliberal theory suggests that earnings will decrease in the countries that attract immigrants which has not been proven by our model, nor has the thesis that earnings will grow in emigrant countries to curb extensive migration been confirmed.

Conclusion

Migration flows have many implications on the home and host countries: from the shortage of skilled workers in emigrant countries to the overloading of the social system in immigrant countries. In this article, we have analysed in detail the impact of migration on the level of wages (earnings) of different types of households. The obtained results indicate a limited impact of migration flows on the level of wages, which is not in accordance with the neoliberal theory. It follows that the usual (ordinary) market model with supply and demand forces is not sufficient to explain the prices of work (salaries, earnings) and that the level of wages can be explained with a range of other variables and market conditions (characteristics).

The number of emigrations has a statistically significant, positive impact on the level of wages in the group of immigrant countries, while the number of immigrants does not influence the wages of any type of household. Additional important variables are the level of earnings in the previous year, the share of people with tertiary education (that negatively impact the level of wages) and the employment rate.

For the immigrant countries, migration flows (emigration and immigration) do not have an impact on wages. The models show the great importance of the macroeconomic variables: growth rate, FDI net inflows and trade balance. In this paper, we did not specifically focus on the educational structure of migrants, but the entire educational structure in emigrant and immigrant countries shows a mixed impact on wages.

The obtained results indicate the precise and quantified impacts of migration flows in Europe on the level of wages. Due to the low impact in immigrant countries and no impact on wages in emigrant countries, it can be concluded that the opening of borders and simplification of migration procedures should (become) be the normal (usual) practice in Europe due to the

higher demand for employees in highly developed countries (such as Germany, Sweden, Austria, etc.) and the inability to find a satisfactory (appropriate) job in the poorer parts of Europe. Migration would not threaten the level of wages of people who already work, which is important as a precondition of wage stability and for the acceptance and welcome of foreign workers. The explanation is that, in immigrant countries, foreign workers fill the gap in the labour market; they fill the available vacancies without actually being in competition with the domestic workers. The labour market can absorb the domestic labour supply as well as immigrants. For the emigrant countries, usually emigrants are usually people without a job or employed in inappropriate job positions. Therefore, their leaving the home country will not have an influence on wage trends.

Migration can even improve data on unemployment and employment rates; it can also have an impact on the perspectives for economic growth (as the literature indicated), but with a very small impact on wages in immigrant countries and no impact on the salaries in emigrant countries.

The results have opened up space for further research. For more precise conclusions and policy recommendations, it would be useful to focus the research on the migrants' level of education and also on the particular sectors where most migrants find their jobs.

Acknowledgement

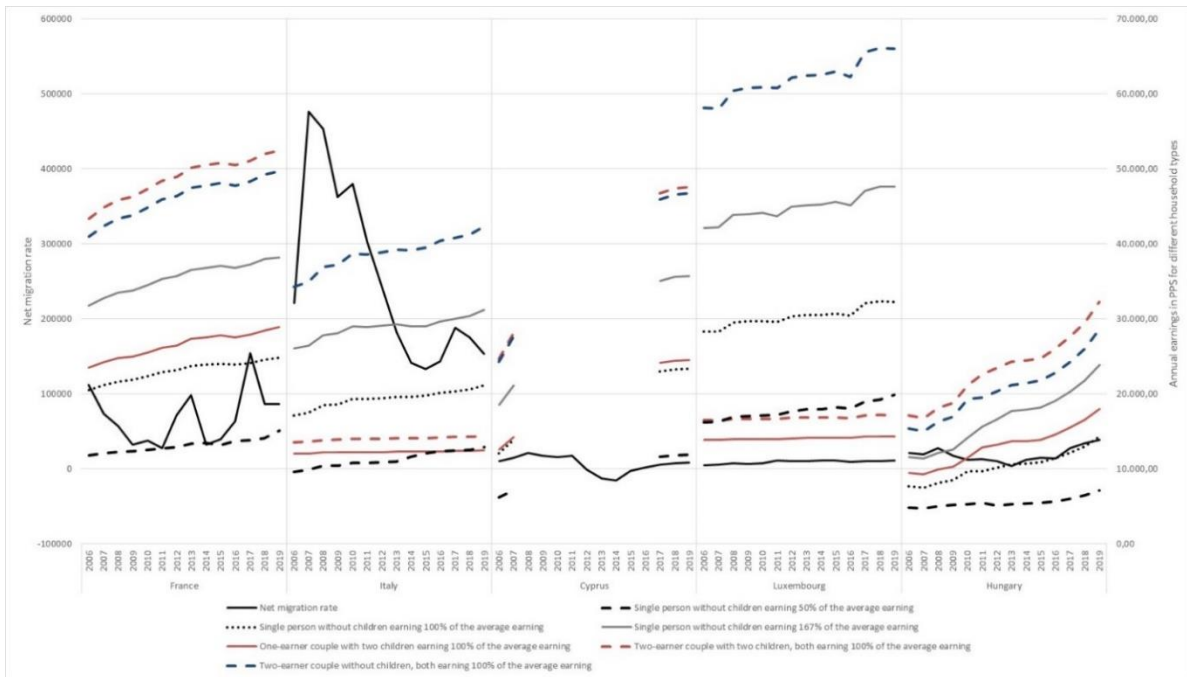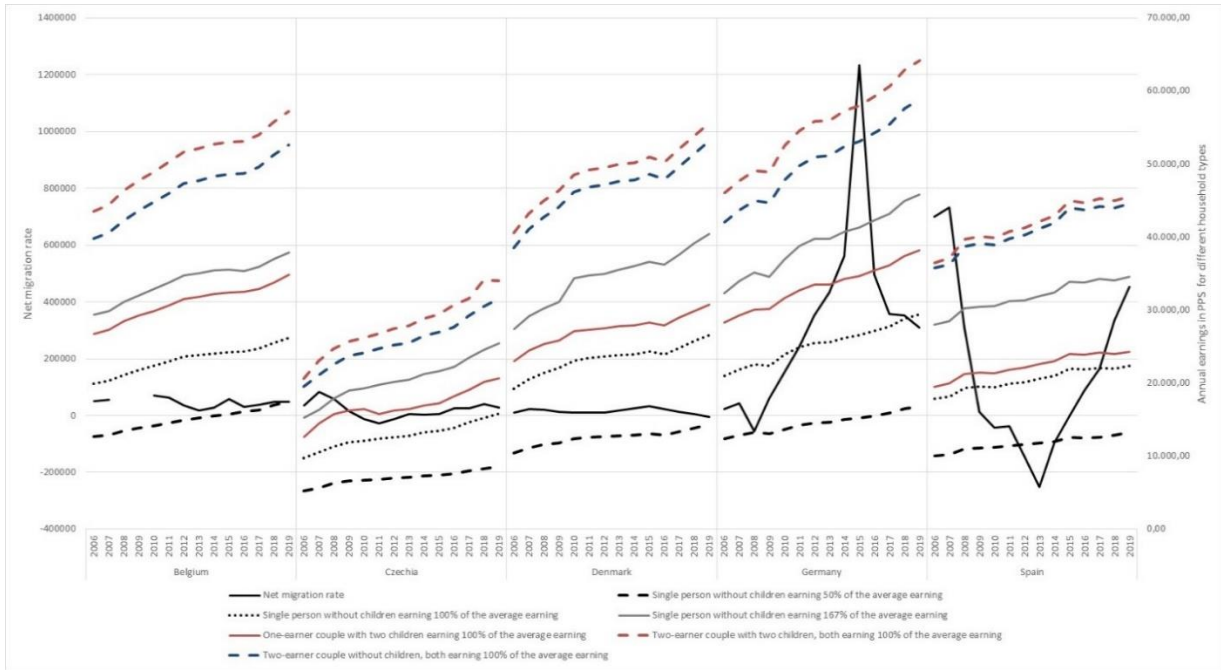## References

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Appendix

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Figure 1. Net migration rate and earnings in PPs for different types of households for immigrant countries, 2006–2019

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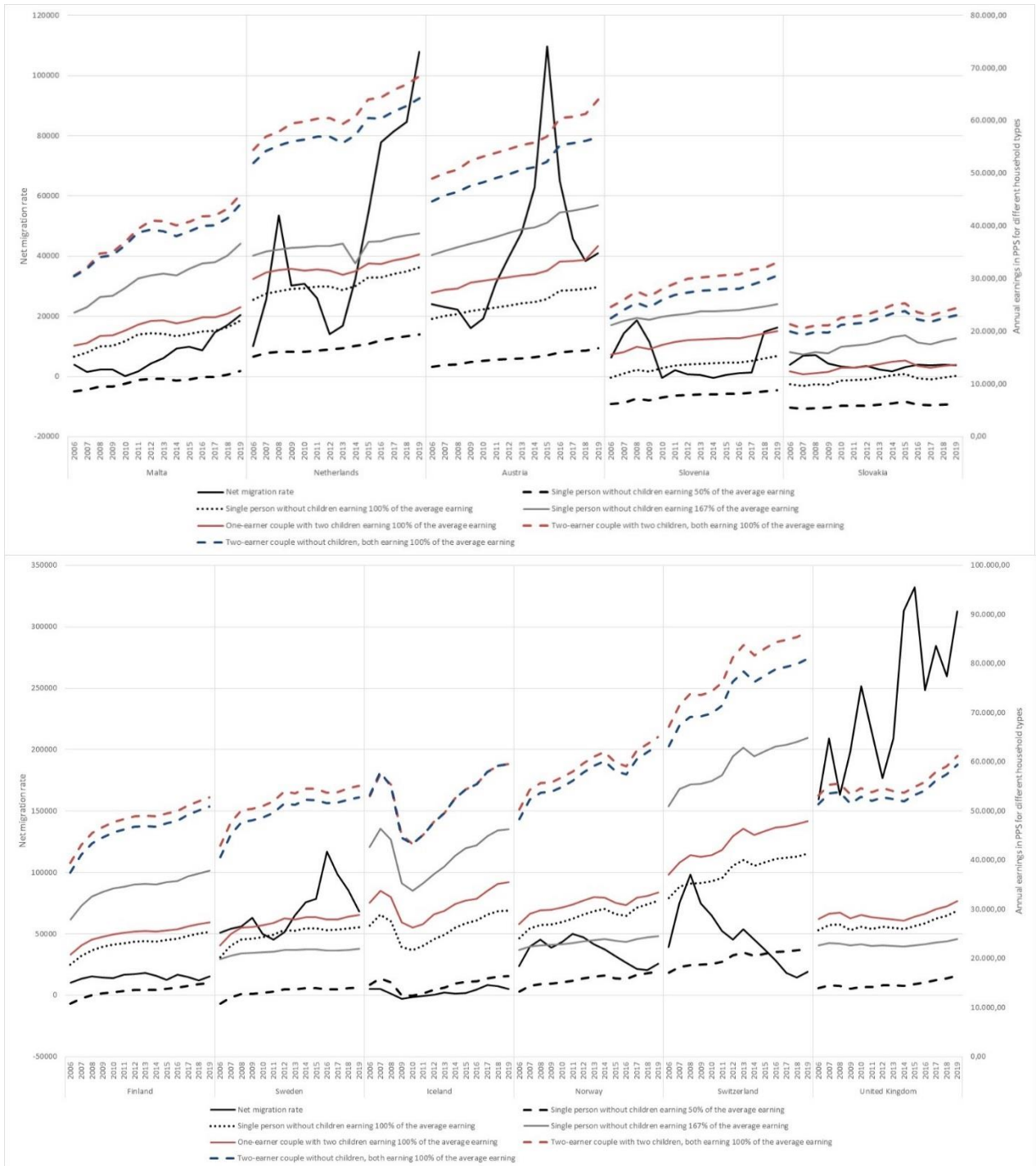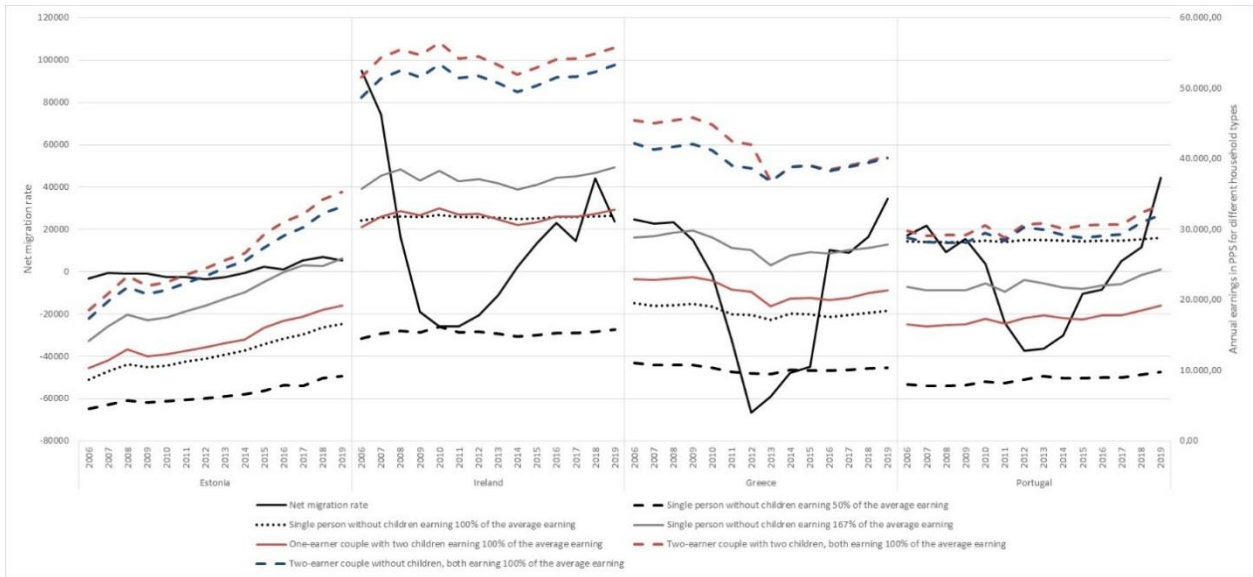

Figure 2. Net migration rate and earnings in PPS for different types of households for both immigrant and emigrant countries, 2006–2019
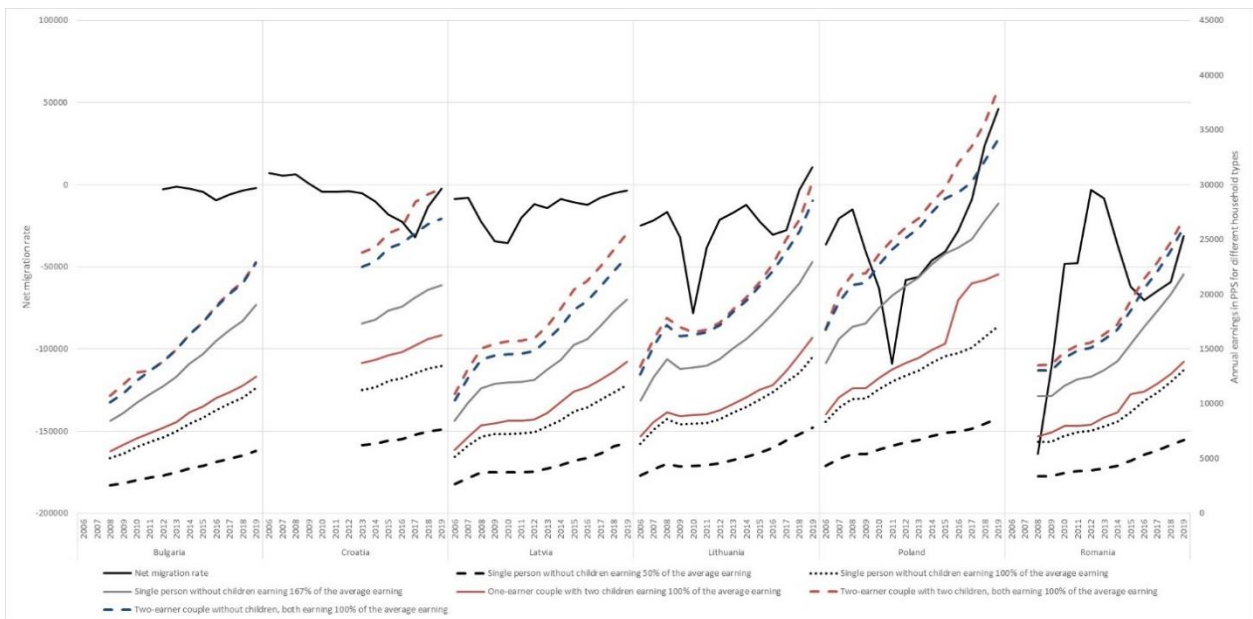

Figure 3. Net migration rate and earnings in PPS for different types of households for emigrant countries, 2006 – 2019

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Table 2. Descriptive statistics for immigrant countries

Variable	Mean	Std. dev	Min	Max
Net earnings of a single person without children earning 50% of the average earnings (in PPS)	12344.22	3978.68	4600.54	21889.67
Net earnings of a single person without children earning 100% of the average earnings (in PPS)	21801.63	6956.43	7521.59	41321.80
Net earnings of a single person without children earning 167% of the average earnings (in PPS)	33268.92	10463.75	11392.28	64862.05
Net earnings of a one-earner couple with two children earning 100% of the average earnings (in PPS)	25799.59	8230.18	9259.17	47890.02
Net earnings of a two-earner couple with two children, both earning 100% of the average earnings (in PPS)	46248.65	14635.70	16780.76	86485.76
Net earnings of a two-earner couple without children, both earning 100% of the average earnings (in PPS)	43727.69	13800.00	15043.17	80967.75
Emigration (absolute number)	93296.95	127775.00	1705.00	737889.00
Immigration (absolute number)	150456.70	213983.80	2234.00	1571047.00
GDP growth rate (%)	1.82	3.37	-14.43	25.16
Inflation, consumer prices (%)	1.83	1.82	-4.48	12.69
Foreign direct investments, net inflows (% of GDP)	13.89	44.12	-58.32	449.08
External balance of goods and services, current prices (million €)	16159.43	41467.62	-62146.00	231246.00
Employed (15-64) with upper secondary and post-secondary non-tertiary education – levels 3 and 4 (% of total employment)	46.05	13.53	15.90	79.5
Employed (15-64) with tertiary education – levels 5 to 8 (% of total employment)	32.75	8.67	14.60	49.20
Employment rate (%)	67.93	7.24	48.80	86.60
Unemployment rate (%)	8.01	4.52	2.10	27.70

Source: Authors.

Table 3. Descriptive statistics for emigrant countries

Variable	Mean	Std. dev	Min	Max
Net earnings of a single person without children earning 50% of the average earnings (in PPS)	6074.646	2233.467	2536.7	11085.17
Net earnings of a single person without children earning 100% of the average earnings (in PPS)	11408.3	3884.821	5073.42	19551.42
Net earnings of a single person without children earning 167% of the average earnings (in PPS)	18321.51	5720.682	8460.34	29881.81
Net earnings of a one-earner couple with two children earning 100% of the average earnings (in PPS)	13101.66	4783.721	5670.69	23192.08
Net earnings of a two-earner couple with two children, both earning 100% of the average earnings (in PPS)	24433.37	9172.788	10744.1	45867.65
Net earnings of a two-earner couple without children, both earning 100% of the average earnings (in PPS)	23237.5	8568.538	10146.82	42226.64
Emigration (absolute number)	76502.53	85119.18	2958	302796
Immigration (absolute number)	58273.09	69975.41	1561	226649
GDP growth rate (%)	2.259081	4.673338	-14.83861	11.98636
Inflation, consumer prices (%)	2.758517	2.990507	-1.736037	15.40232
Foreign direct investments, net inflows (% of GDP)	4.092195	4.439854	-3.104123	31.24702
External balance of goods and services, current prices (million €)	-2545.696	7683.26	-30506.7	25380
Employed (15-64) with upper secondary and post-secondary non-tertiary education – levels 3 and 4 (% of total employment)	56.77768	7.51017	39.3	68.7
Employed (15-64) with tertiary education – levels 5 to 8 (% of total employment)	30.42232	7.718373	14	47.2
Employment rate (%)	62.29911	5.778517	48.8	75.3
Unemployment rate (%)	10.37232	5.239425	3.3	27.7

Source: Authors.

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IMMIGRATION COUNTRIES

Table 3. Arellano-Bond Dynamic Panel Model with (Robust) Standard Errors, 2006-2019 (dependent variable: net earnings of a single person without children earning 50% of the average earnings (in PPS) - earn1)

Variables	Coefficient	Std. error (Robust std. error)	p-value (p-value with robust std.error)
cons	491.7957	133.973 (167.9007)	0.000 (0.003)
d.earn1(-1)	.2078372	.074635 (.099993)	0.005 (0.038)*
emigr	.0009404	.0006714 (.0002944)	0.161 (0.001)**
immigr	-.000098	.0003478 (.0002394)	0.778 (0.682)
gdp	19.15826	12.69907 (12.10851)	0.131 (0.114)
gdp(-1)	-12.92811	10.22966 (11.1658)	0.206 (0.247)
infl	-17.5401	16.91923 (31.9803)	0.300 (0.583)
infl(-1)	12.66777	20.77737 (20.68207)	0.542 (0.540)
fdi	.9758381	1.792052 (1.867443)	0.586 (0.601)
fdi(-1)	.7055417	1.055825 (.5256011)	0.504 (0.179)
d.ext	-.0018638	.0028851 (.0022447)	0.518 (0.406)
d.ext(-1)	-.0005327	.0028172 (.0026712)	0.850 (0.842)
d.educ_sec	-38.46459	27.37018 (18.17954)	0.160 (0.034)**
d.educ_tert	-50.93383	20.08049 (14.23231)	0.011 (0.000)*
d.emp	67.35458	48.86384 (52.78129)	0.168 (0.202)
d.emp(-1)	-35.80037	26.0745 (36.16745)	0.170 (0.322)
unemp	-11.6202	53.84975 (51.25464)	0.829 (0.821)
unemp(-1)	-24.93307	50.93742 (46.43063)	0.624 (0.591)
AR(1)	Prob. = 0.0008		
AR(2)	Prob. = 0.6998		

Notes: *The significance level is 0.05. Term "d" means that the variable is first-differenced. * Unambiguous conclusion below the significance level of 0.05 (with normal or robust standard errors). ** Ambiguous conclusions since the results with robust standard errors are different from the results without robust standard errors.*
Source: *Authors.*

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Table 4. Arellano-Bond Dynamic Panel Model with (Robust) Standard Errors, 2006-2019 (dependent variable: net earnings of a single person without children earning 100% of the average earnings (in PPS) - earn2)

Variables	Coefficient	Std. error (Robust std. error)	p-value (p-value with robust std.error)
cons	1030.264	234.9817 (297.3676)	0.000 (0.001)
d.earn2(-1)	.2396694	.0693095 (.0784517)	0.001 (0.002)*
emigr	.0020222	.0011915 (.0005323)	0.090 (0.000)**
immigr	-.0001775	.0006126 (.0005572)	0.772 (0.750)
gdp	27.62898	22.572 (18.31333)	0.221 (0.131)
gdp(-1)	-26.34544	18.24571 (22.13104)	0.149 (0.234)
infl	-26.91927	29.78297 (57.89022)	0.366 (0.642)
infl(-1)	2.056527	36.86852 (25.35576)	0.956 (0.935)
fdi	2.350157	3.151505 (3.305716)	0.456 (0.477)
fdi(-1)	1.041412	1.864881 (1.128066)	0.577 (0.356)
d.ext	-.0055491	.0051032 (.0041697)	0.277 (0.183)
d.ext(-1)	-.0013303	.0050041 (.0053453)	0.790 (0.803)
d.educ_sec	-48.64843	47.88943 (28.25507)	0.310 (0.085)
d.educ_tert	-87.02571	35.3007 (21.4458)	0.014 (0.000)*
d.emp	205.88	87.105 (109.5159)	0.018 (0.060)**
d.emp(-1)	89.29964	46.96041 (55.8484)	0.057 (0.110)
unemp	18.73639	95.54283 (96.69634)	0.845 (0.846)
unemp(-1)	-104.4817	90.53901 (88.42606)	0.249 (0.237)
AR(1)	Prob. = 0.0006		
AR(2)	Prob. =0.3102		

Notes: *Significance level is 0.05. Term "d" means that the variable is first-differenced. * Unambiguous conclusion below the significance level of 0.05 (with normal or robust standard errors). ** Ambiguous conclusions since the results with robust standard errors are different from the results without robust standard errors.*
Source: *Authors.*

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Table 5. Arellano-Bond Dynamic Panel Model with (Robust) Standard Errors, 2006-2019 (dependent variable: net earnings of a single person without children earning 167% of the average earnings (in PPS) - earn3)

Variables	Coefficient	Std. error (Robust std. error)	p-value (p-value with robust std.error)
cons	1434.346	457.3896 (587.0795)	0.002 (0.015)
d.earn3(-1)	-.0202786	.070389 (.1694837)	0.773 (0.905)
emigr	.0039045	.0023218 (.0011876)	0.093 (0.001)**
immigr	.0009231	.0011903 (.0009065)	0.438 (0.309)
gdp	37.86911	44.31286 (35.83407)	0.393 (0.291)
gdp(-1)	-24.83126	35.31684 (32.03237)	0.482 (0.438)
infl	-18.86137	57.72766 (97.63337)	0.744 (0.847)
infl(-1)	-92.32022	70.97781 (75.53838)	0.193 (0.222)
fdi	15.41736	6.06904 (9.502052)	0.011 (0.105)**
fdi(-1)	.3820297	3.616037 (2.985441)	0.916 (0.898)
d.ext	-.0202387	.0100412 (.0165409)	0.044 (0.221)**
d.ext(-1)	-.0036253	.0097105 (.0085393)	0.709 (0.671)
d.educ_sec	-9.991226	92.85234 (47.94674)	0.914 (0.835)
d.educ_tert	-81.30446	67.7162 (29.11053)	0.230 (0.005)**
d.emp	473.4331	168.6796 (219.5958)	0.005 (0.031)*
d.emp(-1)	-4.989902	91.41358 (90.9068)	0.956 (0.956)
unemp	267.0446	186.0016 (275.1546)	0.151 (0.332)
unemp(-1)	-371.315	175.9524 (247.2045)	0.035 (0.133)**
AR(1)	Prob. = 0.0106		
AR(2)	Prob. = 0.7791		

Notes: *Significance level is 0.05. Term "d" means that the variable is first-differenced. * Unambiguous conclusion below the significance level of 0.05 (with normal or robust standard errors). ** Ambiguous conclusions since the results with robust standard errors are different from the results without robust standard errors.*
Source: *Authors.*

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Table 6. Arellano-Bond Dynamic Panel Model with (Robust) Standard Errors, 2006-2019 (dependent variable: net earnings of a one-earner couple with two children earning 100% of the average earnings (in PPS) - earn4)

Variables	Coefficient	Std. error (Robust std. error)	p-value (p-value with robust std.error)
cons	1004.12	280.0645 (307.3661)	0.000 (0.001)
d.earn4(-1)	.2067835	.0715219 (.0671767)	0.004 (0.002)*
emigr	.0016579	.0013978 (.0006057)	0.236 (0.006)**
immigr	-.0001645	.0007202 (.0005211)	0.819 (0.752)
gdp	34.84244	26.76925 (24.48302)	0.193 (0.155)
gdp(-1)	-11.53421	21.44414 (20.90703)	0.591 (0.581)
infl	3.738581	35.49834 (62.32964)	0.916 (0.952)
infl(-1)	-16.56947	42.64198 (32.36276)	0.698 (0.609)
fdi	4.431194	3.712958 (3.53274)	0.233 (0.210)
fdi(-1)	1.475432	2.173978 (1.445095)	0.497 (0.307)
d.ext	-.006782	.0060038 (.0046259)	0.259 (0.143)
d.ext(-1)	-.0033434	.0059296 (.0056072)	0.573 (0.551)
d.educ_sec	-63.93625	56.62706 (39.57634)	0.259 (0.106)
d.educ_tert	-99.52723	41.3321 (20.45022)	0.016 (0.000)*
d.emp	133.335	102.6617 (90.12759)	0.194 (0.139)
d.emp(-1)	-85.14437	54.93523 (50.86974)	0.121 (0.094)
unemp	.6931121	113.0936 (99.57463)	0.995 (0.994)
unemp(-1)	-82.2127	106.6451 (88.77614)	0.441 (0.354)
AR(1)	Prob. = 0.0005		
AR(2)	Prob. = 0.2981		

Notes: *Significance level is 0.05. Term "d" means that the variable is first-differenced. * Unambiguous conclusion below the significance level of 0.05 (with normal or robust standard errors). ** Ambiguous conclusions since the results with robust standard errors are different from the results without robust standard errors.*
Source: *Authors.*

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Table 7. Arellano-Bond Dynamic Panel Model with (Robust) Standard Errors, 2006-2019 (dependent variable: net earnings of a two-earner couple with two children, both earning 100% of the average earnings (in PPS - earn5)

Variables	Coefficient	Std. error (Robust std. error)	p-value (p-value with robust std.error)
cons	2147.887	514.8753 (549.079)	0.000 (0.000)
d.earn5(-1)	.1832898	.0732981 (.0926469)	0.012 (0.048)*
emigr	.003881	.0025945 (.0009841)	0.135 (0.000)**
immigr	-.0001021	.0013297 (.000966)	0.939 (0.916)
gdp	53.81849	49.56652 (38.11065)	0.278 (0.158)
gdp(-1)	-40.38208	39.73442 (42.58158)	0.309 (0.343)
infl	-27.61863	65.96658 (109.8946)	0.675 (0.802)
infl(-1)	-21.23045	80.0925 (56.13329)	0.791 (0.705)
fdi	6.61339	6.899985 (6.726966)	0.338 (0.326)
fdi(-1)	3.28541	4.042546 (2.697105)	0.416 (0.223)
d.ext	-.0099674	.0111337 (.0088208)	0.371 (0.258)
d.ext(-1)	-.004526	.0109704 (.010824)	0.680 (0.676)
d.educ_sec	-78.94617	104.8274 (67.05134)	0.451 (0.239)
d.educ_tert	-177.781	77.06269 (37.15345)	0.021 (0.000)*
d.emp	394.452	190.8701 (211.3193)	0.039 (0.062)**
d.emp(-1)	-156.5069	103.1342 (104.6428)	0.129 (0.135)
unemp	48.12921	209.4891 (192.1186)	0.818 (0.802)
unemp(-1)	-226.0585	197.856 (172.1138)	0.253 (0.189)
AR(1)	Prob. = 0.0009		
AR(2)	Prob. = 0.3160		

Notes: *Significance level is 0.05. Term "d" means that the variable is first-differenced.* * *Unambiguous conclusion below the significance level of 0.05 (with normal or robust standard errors).* ** *Ambiguous conclusions since the results with robust standard errors are different from the results without robust standard errors.*
Source: *Authors.*

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Table 8. Arellano-Bond Dynamic Panel Model with (Robust) Standard Errors, 2006-2019 (dependent variable: net earnings of a two-earner couple without children, both earning 100% of the average earnings (in PPS) - earn6)

Variables	Coefficient	Std. error (Robust std. error)	p-value (p-value with robust std.error)
cons	2056.124	470.7324 (596.968)	0.000 (0.001)
d.earn6(-1)	.2376507	.069584 (.0777478)	0.001 (0.002)*
emigr	.0040246	.0023869 (.0010503)	0.092 (0.000)**
immigr	-.0003596	.001227 (.0011145)	0.769 (0.747)
gdp	58.78098	45.25237 (35.78973)	0.194 (0.101)
gdp(-1)	-50.32768	36.54808 (43.32097)	0.169 (0.245)
infl	-55.32852	59.76905 (116.3673)	0.355 (0.634)
infl(-1)	8.076001	73.91047 (50.66339)	0.913 (0.873)
fdi	4.521044	6.32124 (6.656857)	0.474 (0.497)
fdi(-1)	2.285753	3.73453 (2.279765)	0.540 (0.316)
d.ext	-.0111269	.0102235 (.0082791)	0.276 (0.179)
d.ext(-1)	-.0028465	.0100234 (.010631)	0.776 (0.789)
d.educ_sec	-93.58758	95.98737 (57.91715)	0.330 (0.106)
d.educ_tert	-177.7242	70.77677 (43.0403)	0.012 (0.000)*
d.emp	411.314	174.1047 (224.2244)	0.018 (0.067)**
d.emp(-1)	-182.8407	94.04634 (111.2575)	0.052 (0.100)
unemp	39.98744	190.8231 (190.4449)	0.834 (0.834)
unemp(-1)	-211.8179	180.5261 (176.4556)	0.241 (0.230)
AR(1)	Prob. = 0.0006		
AR(2)	Prob. = 0.3235		

Notes: *Significance level is 0.05. Term "d" means that the variable is first-differenced. * Unambiguous conclusion below the significance level of 0.05 (with normal or robust standard errors). ** Ambiguous conclusions since the results with robust standard errors are different from the results without robust standard errors.*
Source: *Authors.*

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Table 9. Arellano-Bond Dynamic Panel Model with (Robust) Standard Errors, 2006-2019 (dependent variable: net earnings of a single person without children earning 50% of the average earnings (in PPS) - earn1)

Variables	Coefficient	Std. error (Robust std. error)	p-value (p-value with robust std.error)
cons	315.2249	130.0802 (188.6118)	0.015 (0.095)
d.earn1(-1)	.0559059	.1289967 (.1929405)	0.665 (0.772)
emigr	-.0011905	.0015223 (.0009577)	0.434 (0.214)
immigr	.0003516	.0018278 (.0007082)	0.847 (0.620)
gdp	35.87144	14.3773 (13.19025)	0.013 (0.007)*
gdp(-1)	2.293987	12.15216 (11.32382)	0.850 (0.839)
infl	-1.726141	13.79758 (12.38466)	0.900 (0.889)
infl(-1)	-4.047724	17.56802 (14.20232)	0.818 (0.776)
fdi	-23.28729	15.41686 (6.045918)	0.131 (0.000)**
fdi(-1)	10.294	14.42275 (8.534918)	0.475 (0.228)
d.ext	-.0123019	.0099371 (.0049801)	0.216 (0.014)**
d.ext(-1)	.0002365	.0095342 (.005695)	0.980 (0.967)
d.educ_sec	18.9095	38.1677 (17.95613)	0.620 (0.292)
d.educ_tert	-8.998254	45.55138 (28.17963)	0.843 (0.749)
d.emp	4.972367	52.15398 (35.77901)	0.924 (0.889)
d.emp(-1)	23.42443	22.8623 (16.77294)	0.306 (0.163)
unemp	35.20083	43.55591 (35.86714)	0.419 (0.326)
unemp(-1)	-41.36564	40.99649 (26.42979)	0.313 (0.118)
AR(1)	Prob. = 0.0687		
AR(2)	Prob. = 0.2365		

Notes: *Significance level is 0.05. Term "d" means that the variable is first-differenced. * Unambiguous conclusion below the significance level of 0.05 (with normal or robust standard errors). ** Ambiguous conclusions since the results with robust standard errors are different from the results without robust standard errors. Because of a relatively small T and first differencing (losing one period), we do not use p-values such as 0.05 as a hard threshold for the AR test but 0.10.*
Source: *Authors.*

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Table 10. Arellano-Bond Dynamic Panel Model with (Robust) Standard Errors, 2006-2019 (dependent variable: net earnings of a single person without children earning 100% of the average earnings (in PPS) - earn2)

Variables	Coefficient	Std. error (Robust std. error)	p-value (p-value with robust std.error)
cons	574.0238	204.9939 (123.6433)	0.005 (0.000)
d.earn2(-1)	.1342237	.1327267 (.1437949)	0.312 (0.351)
emigr	-.0005466	.0022506 (.0009393)	0.808 (0.561)
immigr	-.0007483	.0027037 (.001036)	0.782 (0.470)
gdp	56.41164	21.89282 (23.17681)	0.010 (0.015)*
gdp(-1)	-2.511444	18.38265 (14.69117)	0.891 (0.864)
infl	-4.808492	20.34721 (20.04008)	0.813 (0.810)
infl(-1)	1.162829	26.44163 (24.1885)	0.965 (0.962)
fdi	-28.07781	22.56499 (9.96311)	0.213 (0.005)**
fdi(-1)	33.10612	21.23687 (15.02377)	0.119 (0.028)**
d.ext	-.0209956	.0147267 (.0076187)	0.154 (0.006)**
d.ext(-1)	.0041024	.0143481 (.0102388)	0.775 (0.689)
d.educ_sec	15.7627	56.35879 (33.83088)	0.780 (0.641)
d.educ_tert	-14.32909	67.43955 (61.63889)	0.832 (0.816)
d.emp	13.84233	77.39949 (38.24239)	0.858 (0.717)
d.emp(-1)	22.89588	33.81609 (22.7587)	0.498 (0.314)
unemp	23.68768	64.57504 (46.19592)	0.714 (0.608)
unemp(-1)	-45.8888	60.70801 (36.95449)	0.450 (0.214)
AR(1)	Prob. = 0.0833		
AR(2)	Prob. = 0.3078		

Notes: *Significance level is 0.05. Term "d" means that the variable is first-differenced. * Unambiguous conclusion below the significance level of 0.05 (with normal or robust standard errors). ** Ambiguous conclusions since the results with robust standard errors are different from the results without robust standard errors.*
Because of a relatively small T and first differencing (losing one period), we do not use p-values such as 0.05 as a hard threshold for the AR test but 0.10.
Source: *Authors.*

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Table 11. Arellano-Bond Dynamic Panel Model with (Robust) Standard Errors, 2006-2019 (dependent variable: net earnings of a single person without children earning 167% of the average earnings (in PPS) - earn3)

Variables	Coefficient	Std. error (Robust std. error)	p-value (p-value with robust std.error)
cons	1069.701	386.8186 (138.4467)	0.006 (0.000)
d.earn3(-1)	.0264141	.1450741 (.195075)	0.856 (0.892)
emigr	.0014977	.0040682 (0021027)	0.713 (0.476)
immigr	-.0014848	.0048864 (.0014751)	0.761 (0.314)
gdp	49.21818	40.45029 (48.49249)	0.224 (0.310)
gdp(-1)	3.417101	32.28704 (22.10168)	0.916 (0.877)
infl	-17.11501	36.67455 (26.86397)	0.641 (0.524)
infl(-1)	5.964728	49.0835 (41.16369)	0.903 (0.885)
fdi	-14.4187	40.78982 (16.86828)	0.724 (0.393)
fdi(-1)	37.97962	38.28893 (26.86163)	0.321 (0.157)
d.ext	-.041868	.0269984 (.0219203)	0.121 (0.056)
d.ext(-1)	.0007305	.026862 (.023269)	0.978 (0.975)
d.educ_sec	79.77878	101.8782 (48.75836)	0.434 (0.102)
d.educ_tert	-40.55521	121.0239 (125.689)	0.738 (0.747)
d.emp	48.26402	139.374 (57.12349)	0.729 (0.398)
d.emp(-1)	42.19379	60.94269 (38.67183)	0.489 (0.275)
unemp	3.509377	116.3089 (59.24366)	0.976 (0.953)
unemp(-1)	-40.99513	109.3128 (44.20708)	0.708 (0.354)
AR(1)	Prob. = 0.0639		
AR(2)	Prob. = 0.4118		

Notes: *Significance level is 0.05. Term "d" means that the variable is first-differenced. * Unambiguous conclusion below the significance level of 0.05 (with normal or robust standard errors). ** Ambiguous conclusions since the results with robust standard errors are different from the results without robust standard errors.*
Because of a relatively small T and first differencing (losing one period), we do not use p-values such as 0.05 as a hard threshold for the AR test but 0.10.
Source: *Authors.*

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Table 12. Arellano-Bond Dynamic Panel Model with (Robust) Standard Errors, 2006-2019 (dependent variable: net earnings of a one-earner couple with two children earning 100% of the average earnings (in PPS) - earn4)

Variables	Coefficient	Std. error (Robust std. error)	p-value (p-value with robust std.error)
cons	1138.097	380.6895 (205.2939)	0.003 (0.000)
d.earn4(-1)	-.0744745	.1302295 (.1199471)	0.567 (0.535)
emigr	.0010649	.0043597 (.0012293)	0.807 (0.386)
immigr	-.0025698	.0052024 (.0018981)	0.621 (0.176)
gdp	-3.056786	40.96462 (45.49056)	0.941 (0.946)
gdp(-1)	8.183476	32.77048 (16.10464)	0.803 (0.611)
infl	-16.48639	39.1108 (33.72598)	0.673 (0.625)
infl(-1)	-45.61422	50.50816 (52.57272)	0.366 (0.386)
fdi	-31.76099	43.40501 (30.07445)	0.464 (0.291)
fdi(-1)	57.27878	40.8362 (22.98609)	0.161 (0.013)**
d.ext	-.012707	.0285855 (.0275731)	0.657 (0.645)
d.ext(-1)	.0408113	.0270817 (.0217248)	0.132 (0.060)
d.educ_sec	128.4625	108.4152 (58.94986)	0.236 (0.029)**
d.educ_tert	43.35112	131.0648 (88.27466)	0.741 (0.623)
d.emp	37.81386	148.3562 (73.83536)	0.799 (0.609)
d.emp(-1)	38.9802	65.67987 (42.60508)	0.553 (0.360)
unemp	-56.16619	123.8692 (59.50812)	0.650 (0.345)
unemp(-1)	6.184339	116.7213 (60.70363)	0.958 (0.919)
AR(1)	Prob. = 0.0403		
AR(2)	Prob. = 0.8332		

Notes: *Significance level is 0.05. Term "d" means that the variable is first-differenced. * Unambiguous conclusion below the significance level of 0.05 (with normal or robust standard errors). ** Ambiguous conclusions since the results with robust standard errors are different from the results without robust standard errors.*

Because of a relatively small T and first differencing (losing one period), we do not use p-values such as 0.05 as a hard threshold for the AR test, but 0.10.

Source: *Authors.*

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Sanja Blažević Burić

Table 13. Arellano-Bond Dynamic Panel Model with (Robust) Standard Errors, 2006-2019 (dependent variable: net earnings of a two-earner couple with two children, both earning 100% of the average earnings - earn5)

Variables	Coefficient	Std. error (Robust std. error)	p-value (p-value with robust std.error)
cons	2496.24	577.9543 (302.2533)	0.000 (0.000)
d.earn5(-1)	-.2527366	.1320641 (.1578577)	0.056 (0.109)
emigr	-.0004332	.006321 (.0041186)	0.945 (0.916)
immigr	-.0021738	.0075721 (.0033451)	0.774 (0.516)
gdp	16.15585	60.93902 (57.40267)	0.791 (0.778)
gdp(-1)	10.29027	48.31215 (25.76601)	0.831 (0.690)
infl	-9.797346	57.00943 (50.26178)	0.864 (0.845)
infl(-1)	-71.7974	73.90944 (56.38362)	0.331 (0.203)
fdi	-70.48485	63.25747 (34.10688)	0.265 (0.039)**
fdi(-1)	80.60943	59.56501 (36.48561)	0.176 (0.027)**
d.ext	-.0492466	.041741 (.0406768)	0.238 (0.226)
d.ext(-1)	-.0060873	.040729 (.023049)	0.881 (0.792)
d.educ_sec	201.1993	157.9302 (91.3087)	0.203 (0.028)**
d.educ_tert	67.79999	191.2844 (163.6172)	0.723 (0.679)
d.emp	30.36337	216.2635 (131.8629)	0.888 (0.818)
d.emp(-1)	110.8799	95.25434 (115.7681)	0.244 (0.338)
unemp	-79.49991	180.8756 (104.2114)	0.660 (0.446)
unemp(-1)	-26.56483	170.0491 (101.7296)	0.876 (0.794)
AR(1)	Prob. = 0.0840		
AR(2)	Prob. = 0.2662		

Notes: *Significance level is 0.05. Term "d" means that the variable is first-differenced. * Unambiguous conclusion below the significance level of 0.05 (with normal or robust standard errors). ** Ambiguous conclusions since the results with robust standard errors are different from the results without robust standard errors.*
Because of a relatively small T and first differencing (losing one period), we do not use p-values such as 0.05 as a hard threshold for the AR test but 0.10.
Source: *Authors.*

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Sanja Blažević Burić

Table 14. Arellano-Bond Dynamic Panel Model with (Robust) Standard Errors, 2006-2019 (dependent variable: net earnings of a two-earner couple without children, both earning 100% of the average earnings (in PPS) - earn6)

Variables	Coefficient	Std. error (Robust std. error)	p-value (p-value with robust std.error)
cons	1195.696	427.4336 (256.4027)	0.005 (0.000)
d.earn6(-1)	.0937317	.1334304 (.1536355)	0.482 (0.542)
emigr	-.0004695	.0047391 (.0019024)	0.921 (0.805)
immigr	-.0020788	.0057005 (.0024839)	0.715 (0.403)
gdp	105.1679	46.0057 (46.97018)	0.022 (0.025)*
gdp(-1)	-2.444502	38.25373 (28.94849)	0.949 (0.933)
infl	-13.78178	-13.78178 (41.29032)	0.747 (0.739)
infl(-1)	6.198444	6.198444 (50.59303)	0.911 (0.902)
fdi	-52.58709	47.46483 (20.96731)	0.268 (0.012)**
fdi(-1)	65.32599	44.66609 (31.00027)	0.144 (0.035)**
d.ext	-.0447975	.0309925 (.017281)	0.148 (0.010)**
d.ext(-1)	.0039943	.0301146 (.0212568)	0.894 (0.851)
d.educ_sec	42.07384	118.5725 (66.26285)	0.723 (0.525)
d.educ_tert	-38.96805	142.0335 (132.2577)	0.784 (0.768)
d.emp	33.81314	162.6609 (83.08647)	0.835 (0.684)
d.emp(-1)	53.47937	71.12271 (47.78066)	0.452 (0.263)
unemp	39.58148	135.7879 (93.55307)	0.771 (0.672)
unemp(-1)	-83.80475	127.6671 (75.84039)	0.512 (0.269)
AR(1)	Prob. = 0.0908		
AR(2)	Prob. = 0.2869		

Notes: *Significance level is 0.05. Term "d" means that the variable is first-differenced. * Unambiguous conclusion below the significance level of 0.05 (with normal or robust standard errors). ** Ambiguous conclusions since the results with robust standard errors are different from the results without robust standard errors.*
Because of a relatively small T and first differencing (losing one period), we do not use p-values such as 0.05 as a hard threshold for the AR test but 0.10.
Source: *Authors.*