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**Article**

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Amfiteatru Economic Journal

**Provided in Cooperation with:**
The Bucharest University of Economic Studies

*Suggested Citation:* Davidescu, Adriana Ana Maria; Strat, Vasile Alecsandru; Grosu, Raluca Mariana; Zgură, Ion-Daniel (2017) : Determinants of Romanians' Migration within the European Union: Static and Dynamic Panel Gravity Approaches, Amfiteatru Economic Journal, ISSN 2247-9104, The Bucharest University of Economic Studies, Bucharest, Vol. 19, Iss. 46, pp. 621-639

This Version is available at:
https://hdl.handle.net/10419/169094

# DETERMINANTS OF ROMANIANS' MIGRATION WITHIN THE EUROPEAN UNION: STATIC AND DYNAMIC PANEL GRAVITY APPROACHES

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**Please cite this article as:**
Davidescu, A.A.M, Strat, V.A., Grosu, R.M. and Zgură, I.D., 2017. Determinants of Romanians' Migration within the European Union: Static and Dynamic Panel Gravity Approaches. *Amfiteatru Economic*, 19(46), pp. 621-639

**Article History**
Received: 30 March 2017
Revised: 20 May 2017
Accepted: 3 June 2017

**Abstract**
The 1st of January 2007 marked Romania's accession to the European Union (EU) and represented its 'ticket' to a free access to the common market. This soon evolved into an important trigger for the increased migration flows from Romania towards the more developed western countries, members of the EU. Not only the opportunity of a free movement of persons – emerged with the integration - but also the existing socio-economic disparities between Romania and the more developed western countries in the EU, led to unidirectional migration flows.
Using both static and dynamic panel gravity models, we aim to identify the main determinants of Romanians' migration towards 10 EU member states – Czech Republic, Denmark, Italy, Netherlands, Finland, Germany, Norway, Poland, Spain, and Sweden – for the period 2007-2014.
Our empirical findings support the results of other studies performed on different economies. The most important pull factor for Romanians' migration is represented by the economic conditions in the destination countries, proxied by the GDP/capita. Other important pull factors fuelling Romanians' migration refer to the unemployment rate, life expectancy, education spending, and population density. A key role is also played by the existing social networks in the destination countries which are proxied in our model by the lagged migration flows.

**Keywords:** international migration, Romania, panel data, static gravity model, dynamic gravity model

**JEL Classification:** C23, F22, O15, O52

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**Introduction**

The strengthening of the globalization process diminished or even completely eradicated a lot of barriers in front of the free movement of population. In this new context, both scholars and practitioners became increasingly interested in identifying the main determinants that attract persons to certain locations/economies. The identification of these push/pull factors has a significant practical meaning, especially for policymakers. All these factors should represent the foundation of policies intended to diminish the negative effects associated to the free movement of persons and to enhance their positive ones (Predosanu et al., 2011). As, generally, migration flows tend to agglomerate and, therefore, to contribute to the widening of the gaps between economically developed poles and regions/economies which lag behind, policymakers need to pay a special attention to them and to proper manage their evolution.

Migration puts both positive and negative marks on the development of the European Union (EU) and, in particular, of its countries. Along with Bulgaria, Estonia, Latvia, Lithuania, and Poland, Romania is an important provider of immigrants in the EU (Grosu and Constantin, 2013), playing a crucial role in its migration context. In this framework, the analysis of the migration flows from Romania towards Western Europe and the study of their "hidden" causes are of particular importance for three simple reasons, from our perspective:

- knowing the characteristics of the destination countries which attract Romanian migrants may help the Romanian authorities mitigate the differences between Romania and those countries;
- once a migration channel is formed, it can be exploited bidirectional in attracting foreign capital and sending national capital abroad;
- knowing where Romanian migrants tend to agglomerate, helps both the Romanian authorities and the Romanian companies identify the most important external pools of external labour force.

Following these directions, through the present paper we aim to identify which are the most important factors which fuelled the international migration of Romanians, during the period 2007-2014, towards 10 EU economies, respectively: Czech Republic, Denmark, Italy, Netherlands, Finland, Germany, Norway, Poland, Spain, and Sweden. Furthermore, our study is also based on the theory of migration that describes the international movement of labour (Lewis, 1954; Ranis and Fei, 1961, Harris and Todaro, 1970) as a natural cause of differences in supply and demand.

Through the present study and through the developed econometric models we aim to bring a contribution to the enrichment and diversification of the scientific literature, mainly by outlining a comprehensive perspective of the main factors that determine Romanians' migration towards the previously mentioned countries. In a general framework characterised by a valuable literature on this topic (Bleahu, 2004; Sandu et al., 2004; Zamfir et al., 2014; Goschin, 2016; Grosu and Dinu, 2016), through the approach we highlighted and promoted in the paper, we aim to outline a complex and realistic picture of the Romanian migration phenomenon. In addition, the paper has a significant practical impact, as it can represent a proper starting point in developing coherent migration policies in Romania.

In what concerns the structure of the paper, after the introductory section, we outline the general framework associated with migration and the main aspects presented in the specific scientific literature. In the second section of the paper we detail the methodological aspects and the main issues related to the data, while in the third section we discuss the main results and findings. In this section, the research hypotheses are also developed. On one hand, these hypotheses aim to identify the characteristics of the destination countries that have a positive effect on migration, thus encouraging the process - the so-called pull factors, and on the other hand, they aim to identify those characteristics that have a negative effect on the immigration flows, thus discouraging the process. From a methodological point of view, the study is based on both static and dynamic gravitational models, with the clear purpose of identifying the main determinants of immigration flows. We end the paper with a section of concluding remarks where we summarize the main findings and their most important economic implications.

## 1. General framework and literature review

Globalization and all its subsequent developments have brought a significant increase in the migration flows which consequently had an important impact - in both the sending and the receiving countries - in several areas such as demography, economics, sociology, culture, or politics. Taking into consideration the magnitude of the migration flows and all their implications it is obvious why both practitioners and scholars are showing an increasing interest to the phenomenon and to its main causes and determinants.

If national borders (even though they do not represent anymore major barriers for migration in our time) are an important criterion included in migration analysis, we can distinguish between international migration flows and internal migration flows. The focus of our research is on international migration flows; the internal migration is not approached in this paper. However, it is important to outline that the migration within the EU tends to be a mix between the two types of migration, but mostly for economies which are members of the Schengen space; this is not yet applicable for Romania.

Generally, migration studies rely on the central idea that most migration determinants are a result of the differences between the economic development of the source and target areas (countries, regions, cities). Most of these studies start with the best known migration theory describing the international labour movement (Lewis, 1954; Ranis and Fei, 1961; Harris and Todaro, 1970) as being a natural cause of the existing differences between the supply and the demand for labour. Economies with low labour supply are characterized by high wages and they become a target for immigrants looking for better economic perspectives. On the other hand, countries with high labour supply are characterized by lower wages and become source of migration flows. As a result of this phenomenon, wages in the target countries tend to decrease until an equilibrium between the labour supply and demand is reached and wages in source countries tend to increase while equilibrium is reached on the labour market. Therefore, it becomes obvious that target countries shift over time as soon as new economic development poles emerge and old ones lose their attractiveness - an equilibrium on labour markets is reached. Thus, most west European countries, namely the EU15 are preferred targets by immigrants leaving the former communist countries from Eastern Europe. A phenomenon that balances the movement of labour is the movement of capital, including human capital represented by highly skilled workers or managers. This

tends to flow from developed countries towards developing countries where it can bring higher ROIs. Along with the macroeconomic theory explaining the migration flows there is also a microeconomic alternative based on a model of individual alternative choice, where each rational individual decides to migrate only if a cost-benefit analysis reveals a positive net outcome (Sjaastad, 1962; Todaro, 1969, 1976, 1989; Todaro and Maruszko, 1989). Such cost-benefit analysis can be conducted by individuals who choose from several target destinations and they select the one maximizing their utility (Borjas, 1990). Although much of the published research starts from this general theory where migration is a result of different economic factors there are studies (Massey et al., 1993) which find that these factors are not the only ones influencing the migration behaviour.

Stark and Bloom (1985), start with the neoclassical theory on migration and develop the new economics on migration where they describe the human being as part of a more complex social system. Therefore, migration is not just an individual decision of each person but it is rather a result of his/her interdependencies with others (family, close community).

Piore (1979) argues that the labour market is more complex and that its constituent parts can generate the migration of persons with different levels of skills. In his approach, there are low paid jobs which do not involve prestige or status and they are not attractive for locals, but represent an interesting option for migrants coming from underdeveloped economies. On the opposite, there are also highly paid jobs which involve prestige and status which are much more attractive for locals, but these represent quite a difficult target for immigrants. Migration can be regarded as a side effect of the capitalist environment evolution if the world system theory is taken into consideration (Wallerstein, 1974). According to Martínez-Vela (2001) migration is a mechanism which ensures the spread of capitalism economic relations from core countries (developed economies) towards semi-periphery and periphery countries (underdeveloped and developing economies).

The great majority of theories related to migration use as general framework the push and pull model described by Lee (1966). According to it, migration is a result of the interactions between two types of factors, each occurring in one of the two involved economies (source/target). Thus, there are the push factors which make an individual to leave his country and become an immigrant in a new target country. On the other hand, there are the pull factors, occurring in target countries, which persuade individuals to leave their home countries in search of a better life. Starting from this general framework based on push and pull factors, gravity models are used in the specific scientific literature in order to analyse migration. These gravity models are practical descriptions of the Random Utility Model (RUM) (Grogger and Hanson, 2011; Ortega and Peri, 2013; Beine and Parsons, 2015) which compares the utility one person has when living in his home country and the utility had by the same person when moving to another country.

Lately, gravity models were even used to project future migration flows, as part of demographic projections (LeSage and Pace, 2008). Even though the usage of gravity models for explaining migration flows has improved significantly over the last years, there are still important limitations that need to be regarded with caution. Some of these may refer to the availability of bilateral migration data, the definition of the involved variables, and the measurement of the included variables.

## 2. Research goal, methodology and data issues

Before putting forward the main methodological aspects of the paper it is mandatory to emphasise that, generally, the studies on migration face an important limitation. This is given by the unreliability of the official data, which, most often, do not outline the complexity of the phenomenon. In what concerns the EU countries, especially Romania as a particular case, the official migration severely underestimates the real migration, since there is a significant majority of immigrants which is not recorded by the official statistics since the administrative steps are not performed. Furthermore, data on the international migration recorded for Romania refers only to the legal permanent migration. Accomplishing analysis on migration based on these data generates most of the time results that do not reflect the real image and dimension of the phenomenon. This is an important issue that many scholars have to face when analyzing the international migration phenomenon in Romania (Constantin, Nicolescu and Goschin, 2008; OECD, 2008; Siar, 2008; Zamfir et al., 2010; Zamfir et al., 2014). However, more recent efforts of the National Institute of Statistics are oriented towards overcoming this gap by registering also the temporary migration.

### 2.1. Research goal

Romania's accession to the EU granted its access to a space with low barriers on international circulation of persons. This somehow fuelled the increase in the migration flows from Romania to other more developed European socio-economic systems. In this context, through the analysis accomplished in this paper we aim to identify the main pull factors that influence the migration decision of Romanians towards other EU countries. For achieving our goal we rely on both static and dynamic panel gravity models, estimated for the period 2007 - 2014 for 10 EU economies: Czech Republic, Denmark, Italy, Netherlands, Finland, Germany, Norway, Poland, Spain, and Sweden.

### 2.2. Methodology and data issues

Taking into account the limitations regarding bilateral migration flows, gravity models have been widely applied in the analysis of the migration phenomenon in order to identify the main pull factors in the destination country that could influence individuals' decision of migration. The origin of the gravity model dates back to the '40s, when it was assumed that the dimension of bilateral economic activities between two countries depends on the product between the dimensions of both economies and on the physical distance between them, using theoretical aspects widely used in physics. Thereby, this assumption relies on Newton´s law on universal gravitation (1687) which applied in physics states that the attractive force between two bodies is directly related to their size and inversely related to the distance between them.

Thus, using this assumption, the basic version of the gravity model proposed by Tinbergen (1962) involved the following specification, which relies only on the size of the studied economies and on the distance between them:

$$\log M_{ij} = \beta_0 + \beta_1 \log Y_i + \beta_2 \log Y_j + \beta_3 \log D_{ij} \quad (1)$$

Where:

$M_{ij}$ = the migration flow from Romania (country *i*) to respective destination country *j*, as inflows of foreign population by nationality.

$Y_i$ = GDP in country *i*

$Y_j$ = GDP in country *j*

$D_{ij}$ = the distance between country *i* and country *j*

The development of the model can be done using a stepwise approach, by constructing consecutive hypothesis about other factors that can exert a certain influence on the migration flows. A first development could be done by including the population size, relying on the plausible assumption according to which a higher population size could imply a higher propensity of migration.

In the last decades, developments in the area promoted an approach which provided a binary segregation between the factors influencing migration behaviour, respectively the push and pull factors (Lee, 1966). The methodology we propose focuses on investigating only the main pull factors that have an increased potential in attracting Romanians in 10 EU destination countries. The push factors which may lead Romanians to leave their home country are not the focus of our paper. They will only be mentioned along the paper as secondary aspects that need to be kept in mind as potential future research directions.

The characteristics of the destination countries which have a high potential of being pull factors included in our research are presented in table no. 1. For each factor, its source and notation as variable included in the econometric models are highlighted in the table.

**Table no. 1: Variables and data sources**

| Indicator | Source | Variable |
|---|---|---|
| Migration flow from Romania to respective destination country (thousands persons), as inflows of foreign population by nationality. | International Migration Database, OECD. (OECD, 2017a) | M |
| GDP at PPS per capita, US thousand dollars, 2010 | GDP, volume at constant PPP, thousand US dollars, 2010 was provided by the Economic Outlook Database, OECD, while the data related to population was provided by the Labour Force Statistics Database, OECD. (OECD, 2016a, 2017b) | GDP_CAP |
| Employment/population ratio, %, 15-64 years old | Labour Force Statistics Database of OECD. (OECD, 2017b) | ER |
| Labour force participation rate, 15-64 years old | Labour Force Statistics Database of OECD. (OECD, 2017b) | LFR |

| Indicator | Source | Variable |
|---|---|---|
| Unemployment rate, % | Labour Force Statistics Database of OECD. (OECD, 2017b) | UR |
| Tax rate (tax revenue as % of the GDP) | Taxation and Revenue Statistics Database, OECD. (OECD, 2017b) | TR |
| Life expectancy (total population at birth, years) | Health Database, OECD. (OECD, 2016b) | LE |
| Education spending as % of the GDP | Education at a glance: Educational finance indicators, OECD. (OECD, 2016c) | ED_SP |
| Old age pensions public expenditure as % of the GDP | Social Protection and Well-being database, OECD. (OECD, 2017c) | OLD_PENS |
| Public expenditure on disability and sickness cash benefits, in % of the GDP | Social Protection and Well-being database, OECD. (OECD, 2017c) | DIS_SP |
| Family benefits public spending, % of the GDP | Social Expenditure: Aggregated data, OECD. (OECD, 2017c) | FAM_SP |
| Public unemployment spending, % of the GDP | Social Expenditure: Aggregated data, OECD. (OECD, 2017c) | UNEMPL_SP |
| Public spending on labour markets, % of the GDP | Labour market programs: expenditure and participants, OECD. (OECD, 2017d) | LAB_SP |
| Population density - Persons per $km^2$ | Population Database, Eurostat. (Eurostat, 201-) | POP_DENS |
| Road distance between the capitals of both countries | Jeka website. (JekaTurism, 2017) | DIST |
| Political Stability and Absence of Violence/Terrorism measures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism. Ranges from approximately -2.5 (weak) to 2.5 (strong) governance performance | Worldwide Governance Indicators (WGI), World Bank. (The World Bank Group, 2017) | Political stability |
| Regulatory Quality – Reflects perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. | Worldwide Governance Indicators (WGI), World Bank. (The World Bank Group, 2017) | Regulatory Quality |

| Indicator | Source | Variable |
|---|---|---|
| Rule of Law – Reflects perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. | Worldwide Governance Indicators (WGI), World Bank. (The World Bank Group, 2017) | Rule of law |

The study takes into account 10 potential countries for Romanian migrants - Czech Republic, Denmark, Finland, Germany, Italy, Netherlands, Norway, Poland, Spain, and Sweden - for the period 2007-2014. The main reasons behind the selection of these countries are the following:

- Spain and Italy, the only two countries located on the southern part of the EU, were the first target countries of Romanian migration flows due to the cultural and language similarities. They are the most important receivers of Romanian migrants and, in the same time, Romanians represent the most important communities of immigrants in these countries; for example, in 2012, 2.34 millions Romanians were outside the national borders - out of them, 46% were in Italy and 34% in Spain (Dinu, Grosu and Saseanu, 2015; Grosu and Dinu, 2016).

- Romanians (those choosing to migrate) started to consider the north of Europe as a viable immigration alternative once the global crisis was strongly felt in the Spanish and Italian economies which were traditional immigration alternatives.

The restriction regarding the period of time comes from the fact that Romania's accession to the EU was in 2007 and 2014 represents the year for which the most recent data were available on Eurostat webpage. Another notable limitation of the study is represented by the quality of data. As many scholars emphasize, they only quantify the official migration. This way they underestimate the reality and fail in measuring the real magnitude of the phenomenon. The panel-models that we propose in the current study were estimated using the fixed effects (FEM) and the random effects (REM). The selection of the appropriate model was accomplished using the Hausman test.

The static gravity model that we propose has the following general specification:

$$\log\left(M_{ijt}\right) = \beta_0 + \beta_1 \log\left(Y_{jt}\right) + \beta_2 \log\left(D_{ijt}\right) + \beta_3 Lang_{ijt} + \sum_h \delta_h P_{jht} + u_{ijt} \qquad (2)$$

Where:

$M_{ij}$ - The migration flow from Romania (country *i* to respective destination country *j*), as inflows of foreign population by nationality.

Yj – GDP of country *j*;

$D_{ij}$ - The road distance between country *i* and country *j*;

$u_{ij}$ - The residual variable;

$\beta_i$ - The model parameters;

$\delta_h$- The model parameters;

$P_{jh}$ - The list of explanatory variables specific to destination country.

$lang_{ij}$ – A binary variable which can take the value 1 for linguistic interconnected countries and the value 0 for the other countries that are not linguistic interconnected.

In order to increase the suitability of the data set and to reduce variability in some variables, logarithms were used.

The dynamic gravity model incorporates the static optimal model by including an additional variable, $\log\left(M_{ijt-1}\right)$ which quantifies the migration flows from Romania towards the destination countries (*j*) in the previous year, denoted with (t-1).

The main argument for including into the analysis of the dynamic gravity model starts with the necessity of testing the hypothesis according to which migration flows from previous year could lead to an increase of migration flows in the current year, this fact being favoured by the existence of relatives and friends in the destination country, who could facilitate and help the immigrant in his process of integration in the new country. Consequently, it is important to analyse if this continuing migration flows could transform some of the destination countries into migration poles at European level.

From a methodological point of view, this lagged value of the dependent variable has as main role solving the endogeneity problems. Also, in order to avoid potential multicollinearity issues several variables were included in the basic model separately and afterwards stepwise.

The general specification of the dynamic gravity model that we have proposed is the following:

$$\log\left(M_{ijt}\right)=\beta_0+\beta_1\log\left(Y_{jt}\right)+\beta_2\log\left(D_{ijt}\right)+\beta_3 Lang_{ijt}+\beta_4\log\left(M_{ijt-1}\right)+\sum_h\delta_h P_{jht}+u_{ijt} \quad (3)$$

Taking into consideration the proposed specifications, the hypotheses that will be tested within this research are the following:

- *Hypothesis 1*: We expect a positive sign for regression coefficients for both models (static and dynamic), for the following variables: migration flows from the previous year (supporting the increasing trend in the emigration level), GDP in the destination country, labour force participation rate in the destination country, life expectancy in the destination country, private and public spending on education in the destination country, public expenditure on old-age pensions in the destination country, public expenditure on disability and sickness cash benefits in the destination country, public spending on family benefits in the destination country, public unemployment spending in the destination country, public spending on labour markets in the destination country, population density in the destination country, or language.

- *Hypothesis 2*: On the other hand, it is expected to see a negative sign for the regression coefficients of the following variables: unemployment rate, tax rate, distance between countries, and a set of perception variables (economic freedom index, property rights, freedom from corruption, fiscal freedom, government spending, regulatory

efficiency, political stability and absence of violence/terrorism, government effectiveness, regulatory quality, rule of law, control of corruption) specific to the destination country. Since statistical significance was not met at the proposed confidence levels, only a few models including these perception variables are presented in the paper, in the section dedicated to empirical results, including those containing the perceptions' variables.

The estimation of both static and dynamic gravity models started with a model with fixed effects with both cross-section fixed effects and period fixed effects, using the ordinary least squares (OLS) method. Time effects included in the models were intended to capture developments over time which are common to all countries. The test of Redundant Fixed Effects was employed in order to decide which of these models is appropriate for modelling our dataset (fixed effects for period effects, for cross-section effects, or for both). Afterwards, the Hausman test was employed in order to identify which type of model is more appropriate - a FEM or a REM. A low probability of the Hausman test suggests the usage of a FEM, while a high probability of the test suggests the usage of a REM.

When the Hausman test highlights the necessity of using a FEM, it is not possible to include among the independent variables some variables which remain constant over time for each of the included statistical units, as for example distance and language. In order to solve this issue, we have decided to estimate a regression model in which the dependent variable is represented by the individual effects obtained from the panel estimation and the independent variables are represented by the distance and the language. The general structure of this model is:

$$IE_{ij} = \beta_0 + \beta_1 \ln(distance_{ij}) + \beta_2 language_{ij} + \epsilon_{ij} \quad (4)$$

Where:

$IE_{ij}$ - The fixed individual effects.

- *Hypothesis 3*: For this model, the expected sign for language is a positive one, while distance is expected to have a negative coefficient.

The issue of cross-section heteroskedasticity in the panel estimation was addressed using heteroscedasticity corrected standard errors, which is based on the improvement of standard errors of the estimators, without modifying the values of the coefficients. In order to test the presence of residual autocorrelation, the Durbin-Watson statistic was used.

The use of the panel model has the advantage of capturing the important relationships between variables over time and of monitoring the unobserved individual effects of the countries pairs, allowing a generalized gravity model of migration. All proposed econometric models were estimated using the software package E-Views 9.0.

## 3. Empirical results and discussion

The analysis of the evolution of the migration flows during 2007-2014 revealed that the vast majority of Romanians that considered the international migration as a viable option, took this decision immediately after the country's accession to the EU. If in 2007, the average number of Romanian immigrants in the EU was of 51971 thousand persons, in 2014 the average number of immigrants dropped visibly, by more than 50%, registering a level of only 28647 thousand persons (OECD, 2016b). If the 2007 trend can be mainly due

to the opening of the barriers, the entire evolution is oscillating. The fact that the value recorded in 2008 is almost equal with the one recorded in 2014, is remarkable. Also notable is the extremely low migration flow recorded in 2009 - the year when the effects of the economic crisis started to be felt quite severely in the western economies. (Figure no. 1)

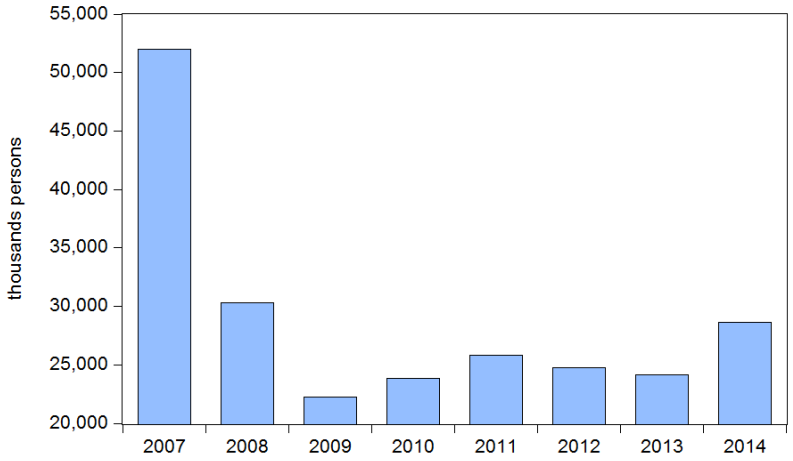


**Figure no. 1: The evolution of the average number of Romanian immigrants in the EU, during 2007-2014**

*Source: Authors' computations, based on data from OECD, 2016b*

Analysing the trend in migration flows from Romania towards the 10 potential destination countries we have included in our analysis, a series of expected facts, but also some interesting aspects were revealed. Over the period 2007-2014, the flows targeted towards Denmark, Finland, Germany, Norway, Netherlands, and Poland recorded an ascending trend. On the other hand, over the same period, the trend recorded by the migration flows towards Italy, Spain, and curiously Sweden was descending. (Figure no. 2) Thus, it becomes increasingly clear how the preferences of Romanian migrants switched over time from countries like Spain and Italy towards countries like Germany and Denmark.

As outlined in the methodology section of the paper, we have started the estimation process of both static and dynamic gravity models with the FEM for both cross-section and period fixed effects, using the OLS method. Afterwards, the usage of the Redundant Fixed Effects test rejected the null hypothesis of redundant fixed effects for period effects, but proved the validity of the cross-section effects. Therefore, we have concluded that the appropriate model is the one with cross-section fixed effects. Furthermore, as a second step, the first model, which is denoted in table no. 2 as MI was estimated assuming the existence of random effects. In order to decide between the usage of fixed effects or of random effects we have performed the Hausman test. The empirical results obtained for the Hausman test revealed that the fixed effects estimator is consistent, having the probability (significance level) less than 1%. In this context, we went further by estimating the next models using the Panel Least Squares. All-important empirical results obtained from the estimation process of the proposed models are presented in table no. 2.

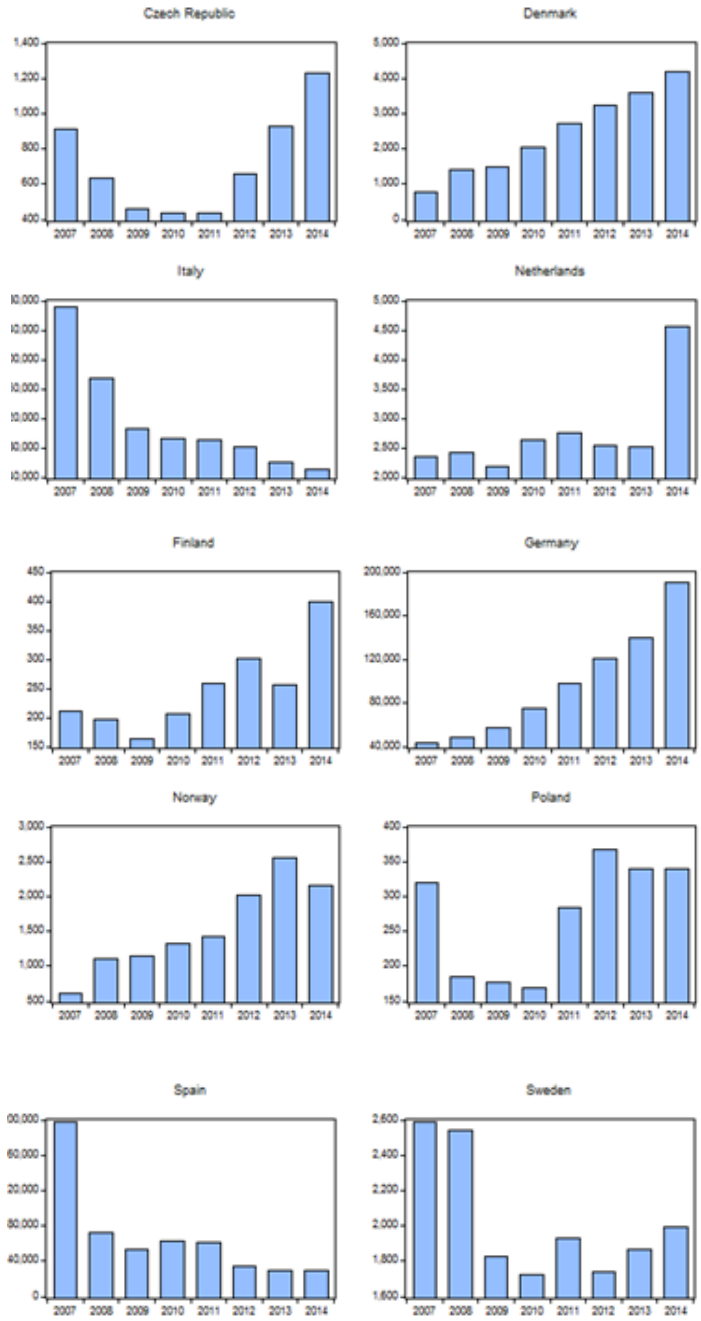


**Figure no. 2: The evolution of the number of Romanian emigrants towards the Czech Republic, Denmark, Italy, Netherlands, Finland, Germany, Norway, Poland, Spain, and Sweden, during 2007-2014**

*Source: Authors' computations, based on data from OECD, 2016b*

One of the first remarkable results, which is in line with previous studies provided by the scientific literature is that the economic conditions in the destination countries are fundamental aspects in the decision process of Romanian migrants. Thus, in all models, the coefficient of GDP per capita is positive and has a high statistical significance supporting therefore, the hypothesis according to which there is a high probability of increase in the migration flows in periods of economic growth and of decrease in periods of economic recession. Another notable finding is that, for Romanian migrants, the level of unemployment in the destination country is more important than the level of employment. In other words, Romanian migrants tend to change their migration behaviour and to orient towards countries that somehow ensure employment opportunities. The idea of migrating to a country and stay unemployed there, is starting to become obsolete. Thus, the coefficients of unemployment are negative and statistically significant in all models. Therefore, a decrease in the unemployment rate of the destination country will increase the migration flows towards that country due to the fact that it signals to migrants that they have high chances to find a job.

The level of taxation in the destination country does not seem to influence so much the migration decision of Romanians. Therefore, we cannot conclude that migrants have a very sophisticated model of selecting a destination country, based on its taxation policies. Another variable which proved to have a significant impact on the migration flows is life expectancy. It seems that Romanians prefer the countries with a high level of life expectancy; these are destinations where migrants expect to find higher living standards.

Another remarkable finding is the fact that the expenditure on education appears to be a very important aspect in the migration decision of Romanian migrants. The positive sign of the coefficient in all models proves that Romanians are attracted by countries which might ensure a better life for them and their families and a better future modelled through a better education system for their children. Also, the level of expenditures on old-age pensions and disability and sickness seems to be another important aspect in the process of deciding the future destination country. Thus, it becomes obvious that Romanians are orienting towards countries which managed to mitigate an important problem of the Romanian society, namely the conditions for the elderly population. Another notable result is that individuals prefer destination countries with a high density of population, which can also be seen as an indicator of the high living standards (the coefficient of the variable is positive and statistically significant).

Surprisingly, perceptions indices about the regulatory quality, about the rule of law or about the political stability do not seem to have a clear influence on the migration decision since they do not have statistically significant coefficients in most of the models where they were used. A potential explanation for this fact may be that the migration decision process is not that sophisticated and it is manly based on satisfying more basic requirements like those referring to the economic rewards, the availability of jobs, the education system, and the prospects for old-age.

**Table no. 2: Empirical results of gravity models of Romanian migration**

| Variables | MI | MII | MIII | MIV | MV | MVI | MVII | MVIII |
|---|---|---|---|---|---|---|---|---|
| Log(GDP_CAP) | 6.31* | 6.08* | 8.42* | 6.45* | 7.83* | 8.26* | **6.48*** | **4.48*** |
| Log(ER) | | 1.03 | | | | | | |
| Log(UR) | -0.64* | -0.78** | -0.80* | | -0.79* | | **-0.91*** | **-0.43*** |
| Log(TR) | 2.03 | | | 4.41* | | | | |
| Log(LE) | 34.83* | 33.71* | 18.86** | 26.82* | 32.35* | 11.37* | **33.53*** | **25.22*** |
| Log(ED_SP) | 3.76* | 4.08* | 3.86* | | 4.45* | 3.14* | **4.42*** | **2.54*** |
| Log(OLD_PENS) | | | 1.86** | | | | | |
| Log(DIS_SP) | | | | 0.63* | | | | |
| Log(FAM_SP) | | | | | 0.14 | | | |
| Log(UNEMPL_SP) | | | | | | -0.21 | | |
| Log(LAB_SP) | | | | | | | | |
| Log(POP_DENS) | | 8.33* | | | 9.19* | 7.47** | **8.61*** | **3.13**** |
| Political stability | | -0.20 | | -1.20* | | | | |
| Regulatory Quality | 0.42*** | | | | | 0.0004 | | |
| Rule of law | | | | | -0.70 | | | |
| Constant | -178.96* | -206.89* | -111.96* | -148.35* | -206.47* | -108.56 | **-204.80*** | **-138.35*** |
| Log(Mij(-1)) | | | | | | | | **0.40*** |
| No of observations | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 |
| Adj.R2 | 0.99 | 0.99 | 0.99 | 0.98 | 0.98 | 0.98 | 0.99 | 0.99 |
| F-test | 330.66* | 356.97* | 359.01* | 220.52* | 343.19* | 291.40* | 426.48* | 756.66* |
| AIC | 0.04 | -0.08 | 0.00 | 0.82 | -0.06 | 0.22 | -0.15 | -0.77 |
| SCH | 0.65 | 0.56 | 0.58 | 1.30 | 0.59 | 0.82 | 0.42 | -0.16 |
| F-test for all individual country effects =0 | 168.00* | | | | | | | |
| F-test for all time effects =0 | 0.10 | | | | | | | |
| Hausman Test | 16.47* | | | | | | | |

*Note: *, **, *** means significance at 1%, 5% and 10% level of significance*

After analysing comparatively all seven models, we can conclude that the optimal static model is the seventh, which has the following estimated equation:

$$\log\left(M_{ijt}\right) = -204.80 + 6.48\log\left(Y_{jt}\right) - 0.91\log\left(UR_{jt}\right) + 33.53\log\left(LE_{jt}\right) + 4.42\log(educ\_sp_{jt}) + 8.61\,pop\_dens_{jt} \quad (5)$$

The analysis of the coefficients of this static gravity model reveals that the level of economic development of the destination country, measured by GDP per capita, together with the level of life expectancy, with the education expenditures and with the population density have a positive influence on the migration flows from Romania towards the 10 selected countries, while the level of the unemployment rate manifests a negative impact. Thus, for these indicators, the first two hypotheses formulated in the methodology section were confirmed.

The coefficient of the GDP per capita, positive and statistically significant at 1% level of significance, points out that the migration flows will increase by 6.48% due to an economic increase of 1%, ceteris paribus, while the coefficient of life expectancy reveals that migration flows will rise with 33.53% due to an increase in the life expectancy of 1%. The positive and statistically significant coefficients of the education expenditures and of the population density point out that migration flows are expected to increase by 4.42%, respectively by 8.61% due to an increase of 1% in the education expenditures or due to the same increase in the population density, ceteris paribus. The influence of the unemployment level is also notable in the migration decision process and the empirical results reveal that most likely, people are interested in countries with a low level of unemployment (a 1% decrease in unemployment rate will generate a 0.91% increase in migration flows).

The simultaneous action of the explanatory variable included in the static gravity model explains about 99% of the variance of the migration flows of Romanians, as showed by the determination coefficient R Square (along with the independent variables we also include here the fixed effects). Starting with this optimal static gravity model, we have constructed a dynamic gravity model, by adding a new independent variable, namely the natural logarithm of migration flows from the previous year. This model is presented below - the estimated version:

$$\log\left(M_{ijt}\right) = -138.35 + 4.48\log\left(Y_{jt}\right) - 0.43\log\left(UR_{jt}\right) + 25.22\log\left(LE_{jt}\right) + 2.54\log(educ\_sp_{jt}) + 3.13\,pop\_dens_{jt} + 0.40\log\left(M_{ijt-1}\right) \quad (6)$$

The general situation remains similar to the one recorded in the case of the static model, namely all coefficients of the variables included in the dynamic model are statistically significant at the 1% threshold. They also present the same signs and have slightly modified values. Another finding, which supports previous studies provided by the scientific literature is represented by the positive and statistically significant coefficient (for a 1% significance level) of the lagged variable, representing the migration flows. According to Bunea (2012, p.132), the previous migration flows, acting as a proxy for the existing social networks or for the availability of information, should positively impact the future migration flows (as pointed out, the information decreases with the increase in the distance between the two countries and increases once the previous migration stock is larger). A very plausible hypothesis supporting this fact is that the migration from the origin country "i" to the destination country "j" may be favoured by the existence of relatives and friends in the destination country. They may facilitate the journey of the recent migrant by providing him/her initial accommodation and also important information about job prospects and country's particularities. Thus, for these variables, the previously formulated hypothesis were confirmed also by the dynamic model.

Finally, for the best static model and for the dynamic panel model we have analysed the impact of language (dummy variable) and distance on the fixed effects of the models, with the aim to test the third hypothesis. Even though the literature provides different studies where these two variables are described as explanatory factors of the migration flows, we did not find such evidence in our study (the coefficients of the two variables are not statistically significant) and thus the hypothesis formulated in the methodology section was refuted. It is worth mentioning that the small number of countries included in our sample, therefore the low number of observations, is an important limitation of our analysis. Another explanation of the results might be the fact that distance is no longer an issue at the EU level, since the transport infrastructure is of high quality (for the majority of EU

regions) and the low cost flight companies have created a fast an affordable transportation alternative all across Europe.

**Conclusions**

Using both static and dynamic panel gravity models, in this paper we aimed to provide a thorough analysis of the main pull factors specific to 10 EU countries (Czech Republic, Denmark, Italy, Netherlands, Finland, Germany, Norway, Poland, Spain, and Sweden) in what concerns the Romanian migration phenomenon, for the period 2007 - 2014. Before outlining the main findings of our analysis, focusing on their notable socioeconomic implications, we are going to highlight the main limitations of our methodology.

First of all, the main limitation of the study, which is a common week point for the vast majority of studies dealing with migration is represented by the availability and reliability of data. As noted by Aziz and Uddin (2016), the lack of data in what regards the number of immigrants is the main pitfall of all studies dealing with this topic. Taking into consideration this observation and knowing that the data reported by official authorities like the National Institute of Statistic or Eurostat tend to underestimate the magnitude of the phenomenon, working with this official data remains the best alternative unless micro level data are available (which is not the case in this situation). Another debatable aspect of the present study is represented by the selection of the sample of destination countries which was also dictated by the availability of data.

A first notable finding is represented by the dynamics of the flow of immigrants which presents a very large value in 2007 (as a direct result of the accession to the EU which lowered the existing barriers) followed by significantly lower values in the coming years (during the period of the economic crisis we have very low migration outflows). Going further with our investigation, based on the evolution pattern of immigrants, we have divided the sample of countries into to broader groups. The first group includes: Italy, Spain, and Sweden which were targeted at the beginning of the analysed period and once the economic crisis was felt, they started to lose their attractiveness. On the other hand, Denmark, Finland, Germany, Norway, Netherlands, and Poland have started to become interesting after the debut of the crisis and they kept their attractiveness in the following years.

The FEM were the appropriate alternative and the main findings obtained after the estimation of eight models are in line with previous findings reported in the scientific literature for other economies. The economic conditions of the destination countries proxied by the GDP/capita are one of the main pull factors, having a positive and statistically significant coefficient in all estimated models. Other important pull factors, with a positive influence, and with statistically significant coefficients, identified by us are: life expectancy (as a proxy for general better living standards), expenditure on education (as a proxy for the existing opportunities for the second generation of immigrants), expenditures associated with old-age pensions and disability and sickness (as a proxy for the social security provided to elders), and density of population (as a measure of the urban development level of an economy). Also, an important influence, but with an opposite sign (a statistically significant coefficient), has the unemployment rate which supports the hypothesis that the Romanian immigration is driven by the search for better job opportunities. Remarkable is also the fact that several perception indices do not have a significant influence. A potential explanation, in our opinion, is represented by the fact that Romanians migration decision is not so sophisticated, and it is mainly driven by the need to satisfy some basic requirements like: higher incomes, better living standard, and better

opportunities for the young generation, and safer environment for elderly people. Also, the existing social networks in the destination countries and the availability of information tend to catalyse future migration; this finding supports the ones identified in Bunea (2012).

Finally, we did not find any evidence that the distance between the source country and the destination country might explain the migration behaviour of Romanians, namely the fixed effects of our models. In this context, noteworthy is the limitation given by the low size sample of countries included in the study. To put in a nutshell, based on the obtained results, we can partially confirm the first two hypotheses while we cannot confirm the third one. Although the obtained results did not support the existence of a significant influence of all factors included in the study over the Romanian immigration flows towards the 10 EU states included in the analysis, a short and clear list of those that are significant was obtained. Thus, besides the scientific utility of the study that outlines one of the first mappings of these factors in the specific scientific literature, for the case of Romania, we deem that the study may also have a high practical utility. Starting with the list of the determinants identified in our study, policymakers may develop coherent policies and programs aiming to diminish the disparities (for these indicators) between Romania and the destination countries chosen by Romanian emigrants.

As a future research direction we aim to restore the analysis using micro level data; this would significantly improve the general image resulted from the current research. Moreover, we consider that carrying out a more in depth analysis where the destination countries would be replaced by destination regions or destination urban areas, would have an increased practical usability and would bring important and valuable insights for the Romanian policymakers. Also, another viable future research direction implies the extension of the analysis on all the EU countries – and some non EU, developed economies – so that we can provide a more complex and comprehensive picture of the Romanian migration patterns.

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