

The Determinants of International Migration. A Panel Data Analysis

Ciprian Pânzaru¹

¹ Department of Sociology, West University of Timisoara, Timisoara, Romania

Correspondence: Ciprian Pânzaru, Department of Sociology, West University of Timisoara, V. Parvan Blvd. No. 4, postal code 300223, Timisoara, Romania. Tel: 4-025-659-2148. E-mail: cpanzaru@socio.uvt.ro

Received: November 26, 2012 Accepted: December 4, 2012 Online Published: February 26, 2013

doi:10.5539/jpl.v6n1p142

URL: <http://dx.doi.org/10.5539/jpl.v6n1p142>

Abstract

The paper analyses two sets of determinants, economic and non-economic, to assess the influence they exerted on migration in Central and Eastern Europe, from 2000 to 2010. In the category of economic factors we have analysed the doing business index and the labour market regulation index. In the category of non-economic factors we have included the judicial independence index and integrity of the legal system index. Since we are talking mainly of labour migration, we have considered that the two economic indicators are suitable for the research purposes. Besides these, the indicators that characterise judicial independence and legal system can be considered as indicators that reflect a certain level of freedom and democracy. The results show that these factors have limited influence on migration.

Keywords: international migration, panel data analysis, migration determinants

1. Introduction

Migration is a phenomenon that has always marked human evolution. Man has relentlessly searched for a place to enjoy better living conditions. Starting with the great migrations of the peoples of Antiquity or Middle Ages to current migration, the phenomenon has always been present and has shaped humankind history. Virtually all countries have been and are involved in the complex process of international migration, joining in the general picture as either as destination countries, or as countries of origin or transit.

Factors underlying migration have evolved differently over time. In the theory of migration (Massey, 2005), the phenomenon's historical approach refers to the period from 1500 to 1800 as the first period of the great modern migrations. This is the so called mercantile period when migration flows were mainly directed from Europe to America, Africa, Asia and Oceania. Most of those who emigrated during this period were farmers, accompanied by a small body of clerks, entrepreneurs and, in some cases, convicts sent to serve their sentence in overseas colonies.

The second largest period is represented by the early nineteenth century industrial migration that industrialised former overseas colonies (Hatton & Williamson, 1994c). According to Ferenczi (1929) and Massey (1998), almost 85% of those who emigrated at that time turned to five countries: Argentina, Australia, Canada, New Zealand, and the USA, and mainly came from Britain, Italy, Norway, Portugal, Spain, and Sweden. These migratory movements have been slowed down, and even blocked, since World War I, the Great Depression of the late '20s and then the Second World War. This period is famous as the period of limited migration (Massey, 1998). So, the next big migration flow occurs only in the '60s. We are speaking of the post-industrial migration period, and, for the first time, alongside the traditional destination, European countries such as Germany, France, Belgium, Switzerland, Sweden, and the Netherlands (Anwar, 1995; Hammar, 1995; Hoffman-Nowotny, 1995; Ogden, 1995 in Massey et al., 1998) became important destinations. Gradually, they are joined in the '70s by countries such as Italy, Spain, and Portugal, which begin to take in immigrants from Africa, Latin America etc. (Fakiolas, 1995).

We note that Europe was in all these stages a provider of emigrants to other continents, particularly to the American continent. Only after 1989, Europe began to face significant intra-continental migratory movements. It is true that up to the fall of the Iron Curtain there have been some migration flows in Europe, such as that of the Turks or former Yugoslavia citizens to Germany. There were also those illegal migrants who escaped the socialist camp. They did not, however, have a significant scale. After 1989, the situation changed radically. Freedom of movement obtained by Central and Eastern European citizens has generated important migratory movements from the East to the West. EU enlargement has facilitated mobility even more. Only in 2010, about 70 million

international migrants resided in Europe, according to Department of Economic and Social Affairs of United Nations (2011).

However, it was not the freedom of movement that led to migration. It only facilitated it. Economic, social and political factors underlay migration modelling.

2. Literature Review

Literature on migration is dominated by the neoclassical theory. It is the theory that emphasises most the role of economic factors in explaining migration (Lewis, 1954; Ranis & Fei, 1961; Harris & Todaro, 1970; Todaro, 1976). According to this theory, migration is caused by differences in the ratio between labour supply and demand. Workforce leaves poor countries where there is no capital and wages are low and will orient towards countries where there is a surplus of capital and therefore wages are higher. Surplus (of workforce for poor countries, of capital for rich countries) is what generates oriented migration and orients migration flows.

In the '80s, starting from the neoclassical migration theory, the new economics of labour migration theory (Stark & Bloom, 1985) was developed. This theory invokes the role of interaction with others, primarily with family, in the decision to migrate.

Other theories introduce the idea of status and prestige in explaining migration (Piore, 1979). Rodrigue (2009) sees migration as a result of distance and population volume action of the two areas: origin and destination.

More recent studies invoke the role of legislative factors (legal restrictions/permissiveness configure the dynamics of migration flows), of factors related to the emigrant's social network or of cultural factors.

In other words, we can say that literature is replete with approaches and theories explaining migration. The fact is that the factors that generate this phenomenon became so multiple and diversified that it is increasingly harder to explain migration by reporting only to one theory or another. Therefore, studies combining a more diversified set of factors in explaining migration are considered to be more adequate to the current socio-economic context.

Mayda (2005) carried out an investigation of economic and non-economic determinants of migration for a panel of OECD member states. It evaluates the role of variables such as GDP per worker (at origin and destination), common language, share of young population, distance, etc. The results do not contradict too much the classical theories of migration, primarily emphasising the role of economic factors. However, along with them, the non-economic factors' role is also highlighted. Vogler & Rotte (1998) made an analysis of migration from developing countries to Germany, also citing both the role of economic factors (GNP, growth of labour force) and that of non-economic factors (political rights, civil liberties, political terror). Their findings highlight the importance of political freedom in shaping migration.

The present study aims to characterise migration through the four indicators, two referring to economic conditions and two referring to political conditions. Thus, for the economic dimension, we chose two indexes calculated by the World Bank: the doing business index and the labour market regulation index. As regards to the political dimension, we chose two other indexes: judicial independence (calculated by the World Economic Forum) and integrity of the legal system (calculated by PRS Group). All these indexes are frequently used in scientific studies and international reports characterising socio-political and economic situations in different countries of the world.

3. Data and Methods

The doing business index is developed taking into account the conditions and laws governing the conduct of a business. In preparing it, the views of over 9,000 experts from 183 countries directly involved in this field are taken into account. The index rather makes reference to regulations directly affecting business and does not take into account other conditions such as the socio-economic and geographical specificity of the country (infrastructure, inflation, access to markets, etc.). The doing business index is based on the assessment of 10 dimensions. They refer to starting a business (i.e., the socio-economic conditions needed to start a business), the procedures and time required to obtain building permits, access to resources (that is, access to essential resources for running a business, such as a connection to the electricity grid), conditions required for registration of property, conditions for obtaining credits, measures to protect investments and investors, the number of charges payable (their value and time spent to pay them), the conditions to achieve international trade (import-export), enforcement of contracts, conditions of entry into insolvency or bankruptcy of a company. The index takes values from 1 to 185, where 1 represents the best value. A high value of this index (i.e., a lower numerical value) indicates that the rules governing the appearance and operation of a business are adequate and allow its smooth running.

According World Bank (<http://www.worldbank.org>), "regulation of the labor market ranges from how employers contract for the services of labor to the nature of the exchange – including the rights and responsibilities of the

parties, the terms and conditions of work, and the resolution of disputes. Labor law protects workers from arbitrary or unfair treatment while addressing labor market failures to deliver efficient and equitable outcomes, such as insufficient information, potential discrimination against vulnerable groups and incomplete insurance of workers against the risks of losing their job. Perhaps more than any other series of exchanges involving capital, the functioning of the labor market has a direct impact on the welfare of workers and their families. For this reason, combined with the scope of cultural, institutional, legal, and political aspects involved, this area of regulation represents an important, visible, and often controversial aspect of public policy” (Betcherman, Luinstra & Ogawa, 2001).

Judicial independence is an index developed by the World Economic Forum (<http://www.weforum.org>). Its development starts from the question in the Global Competitiveness Report: “Is the judiciary in your country independent from political influences of members of government, citizens, or firms? No-heavily influenced (=1) or Yes-entirely independent (=7).” Note that this question was worded differently from year to year, but its meaning was always the same. Responses from the Competitiveness Report have been transformed into a scale between 0 and 10 (from 1 to 7), according to the formula $EFWi = ((GCRi - 1)/6) \times 10$.

Integrity of legal system is an index developed by the PRS Group (<http://www.prsgroup.com>). “It is based on the International Country Risk Guide Political Risk Component I for Law and Order: Two measures comprising one risk component. Each sub-component equals half of the total. The ‘law’ sub-component assesses the strength and impartiality of the legal system, and the ‘order’ sub-component assesses popular observance of the law.”

Data used for 2000 -2010 period were extracted from Fraser Institute trough Economic Freedom of the World Data Base version 2012.0.2 at 10/11/2012. Data analysis was carried out by SPSS and EViews. Methodologically, we used panel data analysis. Countries included in the panel were Central and East European countries: Bulgaria, Czech Republic, Estonia, Latvia, Lithuania, Hungary, Poland, Romania, Slovenia and Slovakia. All these states have experienced the transition from the socialist to the capitalist system, facing socio-economic and political issues approximately alike.

We considered migration as the dependent variable and the nominated indexes as the independent variables. The aim was to identify whether the set of independent variables influence the dependent variable. For this, we used the regression calculation. The equation expressing the relation between measured variables has the following form:

$$MIGR_{it} = \alpha_i + \beta_1 BR + \beta_2 LMR + \beta_3 JI + \beta_4 ILS + \varepsilon_{it} \quad (1)$$

Table 1 includes the descriptive statistics of variables included in the model:

Table 1. Descriptive statistics

	MIGR	BR	LMR	JI	ILS
Mean	9.816582	1.788000	1.807370	1.517264	1.950521
Median	9.768860	1.808289	1.856298	1.526056	1.902108
Maximum	13.22341	2.066863	2.079442	2.014903	2.116256
Minimum	7.115582	1.360977	1.280934	0.832909	1.435085
Std. Dev.	1.409254	0.129867	0.179513	0.269886	0.135757
Skewness	0.292797	-0.619912	-0.567325	-0.254880	-1.580715
Kurtosis	2.453542	3.925240	2.756358	2.616747	8.266560
Jarque-Bera	2.940376	10.96898	6.172799	1.864212	172.9351
Probability	0.229882	0.004151	0.045666	0.393724	0.000000
Sum	1079.824	196.6800	198.8107	166.8990	214.5573
Sum Sq. Dev.	216.4736	1.838326	3.512498	7.939379	2.008860
Observations	110	110	110	110	110

MIGR= international migration flow, BR= business regulation index, LMR=labour market regulations index. JI= judicial independence index, ILS= integrity of legal system index

All variables were analyzed in logarithm. The operation aimed at streamlining them. As such, the evaluated model had the following form:

$$\ln MIGR_{it} = \alpha_i + \beta_1 \ln BR + \beta_2 \ln LMR + \beta_3 \ln JI + \beta_4 \ln ILS + \varepsilon_{it} \quad (2)$$

To have a relatively constant distribution of variation frequencies, we stationered each time series before beginning their analysis. For this, we used the LLC test (Levin, Lin & Chu, 2002), the IPS test (Im, Pesaran & Shin, 2003), ADF – Augmented Dickey-Fuller and PP – Phillips-Perron (Maddala & Wu, 1999). The results are shown in Table 2.

Table 2. Unit root tests

Unit Root Test		LLC ^a	IPS ^b	ADF Fisher ^b	PP Fisher ^a
Variable	Series in:	t*	W-stat	χ^2	χ^2
Ln(MIGR)	Levels	-1.29457*	-0.44395	19.4245	56.0448***
	First Diff.	-4.44214***	-1.57023**	31.0407**	71.4100***
Ln(BR)	Levels	-13.7479***	-7.54320***	79.6679***	51.7491***
	First Diff.	-14.8556***	-11.0407***	114.678***	127.390***
Ln(LMR)	Levels	-4.12765***	-1.39567*	27.8453	49.4918***
	First Diff.	-10.9004***	-5.23869***	65.5908***	66.8927***
Ln(JI)	Levels	-4.65686***	-3.07150**	45.7360***	53.0464***
	First Diff.	-8.61109***	-6.22099***	78.2132***	130.006***
Ln(ILS)	Levels	-0.77352	0.75426	2.31721	1.74279
	First Diff.	0.75426***	2.31721*	1.74279**	-3.47759

(***), (**) and (*) denotes rejection of the unit root hypothesis at the 1%, 5% and 10% levels.

Although stationarity test results showed that some time series are stationary in level, due to the higher level of relevance obtained by calculating them in first difference, we considered more appropriately to use them in this form. As such, the model became:

$$\Delta \ln(MIGR)_{it} = \alpha_i + \beta_1 \Delta \ln(BR) + \beta_2 \Delta \ln(LMR) + \beta_3 \Delta \ln(JI) + \beta_4 \Delta \ln(ILS) + \varepsilon_{it} \quad (3)$$

We estimated the variables both in their fixed effects variant and in their random effects variant. For the estimation of fixed effects, we used a regression with dummy variables (LSDV). The results are shown in columns 1 and 2 of Table 3. We chose this path on the assumption that fixed effects estimation allows the free coefficient to vary cross-sectionally by generating a dummy variable for each section (the number of sections is given by the number of countries included in the panel); the slope parameter remains constant in time and space. Fixed effects estimation has been carried out for a cross-section and for a period. Using fixed effects estimation tests the null hypothesis according to which the free parameter is the same for the entire population (i.e. the same influence for all countries), and its rejection shows that the deficit of social security funds varies cross-sectionally. By using the F test, we were able to eliminate the fixed effects variant for the cross-section, keeping it only for the period. For random effects estimation we used GLS (Generalized Least Square). Random effects estimation allows the free coefficient to modify by increasing or decreasing according to a base with a varying measure (a cross-sectional error term). In other words, we started from the premise that $\varepsilon_{it} = \lambda_i + u_{it}$ şı $Cov(x_{it}, \lambda_i) = 0$, (where λ_i is the individual effect for the period). Results are shown in column 3 of Table 3. To differentiate between fixed effects and random effects, we used the Hausman test (1978). For this test, the null hypothesis considers that both methods (fixed effects and random effects) are appropriate. The alternative hypothesis is that only fixed effects estimation is appropriate and random effects estimation is not. The Hausman test result is highlighted in column 3 of Table 3. To identify the lack or presence of autocorrelation, we used the Durbin Watson test. The test's value allowed us to believe that there was no error autocorrelation. Regarding heteroskedasticity, we used the White standard errors option (Arellano, 2001). The results are shown in column 3 of Table 3.

Table 3. The migration determinants estimation

Independent Variables	Dependent Variable: $\Delta \ln(\text{MIGR})$		
	LSDV Cross-section Period	LSDV Period	GLS Period
Constant	0.099199* (1.778664)	0.109247** (2.594199)	0.108823 (0.832549)
$\Delta \ln(\text{BR})$	-0.461611 (-0.999183)	0.449311 (0.726237)	0.189503 (0.339507)
$\Delta \ln(\text{LMR})$	-0.086081 (-0.150480)	-0.136674 (-0.270070)	-0.139986 (-0.282649)
$\Delta \ln(\text{JI})$	-0.497287 (-1.274488)	-0.177265 (-0.569362)	-0.187798 (-0.609716)
$\Delta \ln(\text{ILS})$	-1.098143 (-1.035023)	-0.268053 (-0.347395)	-0.318799 (-0.414879)
Observations	100	100	100
Number of countries	10	10	10
R-squared	0.075925	0.506080	0.005446
F-test	0.543544	6.778245	0.130052
DW-stat	1.663219	1.684763	1.673214
F-test $\alpha_i = 0$	0.339192	-	-
F-test $\lambda_t = 0$	8.085615***	-	-
Hausman χ^2	-	-	2.580880

(***), (**) and (*) are significant respectively at 1% 5% and 10%, t statistics in parentheses. For GLS it is used White standard errors & covariance (d.f. corrected).

4. Conclusions

Results refute the assumptions made at the beginning. They have shown that the influence of the variables analysed on the time interval and country panel chosen is zero. It was obvious that economic factors, as invoked by the main theories of migration (the neoclassical migration theory, the new economics of migration, the dual labour force market theory) play the most important role in shaping the phenomenon. But taking into account the specificities of countries analysed (transition from a communist-socialist system to a democratic-capitalist one) and sensitivities of the population of these countries in matters relating to freedom, we expected that variables invoked would exert some influence on migration. Furthermore, studies using the same methodology, but made in the OECD countries (Mayda, 2005), have shown the influence of non-economic factors in shaping migration. However, reported to the results for the panel of countries used, we can say that migration and the decision to migrate are not influenced by the rules and conditions necessary for doing business (business regulation). As we look more closely at this result, despite initial expectations, it does not appear all that surprising. The explanation is given by the profile of those who chose to emigrate. Generally those who emigrate have relatively low skills (<http://www.euractiv.com>, 2012) and prefer to work abroad accepting lower paid jobs than natives (according dual labour market theory). Their profile does not fit that of an entrepreneur, thus making it is highly unlikely that those who emigrated have sought to develop their own business at home. In these circumstances, it is obvious that they are indifferent to the rules governing the business environment. A derivative of this conclusion is the interpretation on labour market regulation. Working conditions have not necessarily led to the decision to migrate, but simply the absence of a workplace (Enache & Panzaru 2012). Regarding judicial independence and integrity of the legal system, we find that the explanation is related to the individual's civic and political culture. With a 40-year old communist past, the 20 years of democracy have seemingly failed to develop at the individual level o coherent

attitude towards dimensions such as justice freedom. The discussion on justice freedom and freedom in general is very present in the media, but these concepts are difficult to interpret rationally by the individual due to their high level of abstraction.

We rest on the fact that a more comprehensive understanding of the determinants of migration involves continuous testing of the influence of one or the other to determine the place and role they play in the overall equation explaining migration.

References

- Arellano, M. (2001). *Panel data econometrics*. <http://dx.doi.org/10.1093/0199245282.001.0001>
- Betcherman, G., Luinstra, A., & Ogawa, M. (2001). Labor market regulation: International experience in promoting employment and social protection. *World Bank, Social Protection Discussion Paper Series*, (0128).
- Enache, C., & Panzaru, C. (2012). *Romanian Migration Flows in European Countries: Does Social Security Matter?* Manuscript submitted for publication.
- EurActiv. (2012). *Central and Eastern Europe's emigration challenge*. Retrieved from <http://www.euractiv.com/europes-east/central-eastern-europes-emigrati-analysis-512346>
- Fakiolas, R. (1995). The role of migration in raising the skill level of the labour force. *Studi Emigrazione*, 117, 221-223.
- Ferenczi, I. (1929). International Migration Statistics. In *International Migrations, Volume I: Statistics*, 76. NBER.
- Harris J. R., & Todaro, M. P. (1970). Migration, Unemployment and Development: A Two-Sector Analysis *The American Economic Review*, 60(1), 126-142.
- Hatton, T. J., & Williamson, J. G. (1994). *Migration and the International Labour Market 1850-1939*. London: Routledge.
- Hausman, J. A. (1978). Specification tests in econometrics. *Econometrica: Journal of the Econometric Society*, 1251-1271. <http://dx.doi.org/10.2307/1913827>
- Im, K. S., Pesaran, M. H., & Shin, Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of econometrics*, 115(1), 53-74. [http://dx.doi.org/10.1016/S0304-4076\(03\)00092-7](http://dx.doi.org/10.1016/S0304-4076(03)00092-7)
- Levin, A., Lin, C. F., & James Chu, C. S. (2002). Unit root tests in panel data: asymptotic and finite-sample properties. *Journal of econometrics*, 108(1), 1-24. [http://dx.doi.org/10.1016/S0304-4076\(01\)00098-7](http://dx.doi.org/10.1016/S0304-4076(01)00098-7)
- Lewis, W. A. (1954). Economic Development with Unlimited Supplies of Labour. *The Manchester School*. 22 (2), 139-191. <http://dx.doi.org/10.1111/j.1467-9957.1954.tb00021.x>
- Maddala, G. S., & Wu, S. (1999). A comparative study of unit root tests with panel data and a new simple test. *Oxford Bulletin of Economics and statistics*, 61(S1), 631-652. <http://dx.doi.org/10.1111/1468-0084.0610s1631>
- Massey D. S., Arango J., Hugo G., Kouaouci A., Pellegrino A., & Taylor E. J. (1998). *Worlds in Motion Understanding International Migration at the End of the Millennium*. Oxford: Clarendon Press.
- Mayda, A. M. (2005). International Migration: A Panel Data Analysis of Economic and Non-Economic Determinants. *IZA Discussion Paper No. 1590*. Retrieved from <http://ssrn.com/abstract=725441>
- Piore, M. J. (1979). *Birds of passage: migrant labor and industrial societies*. Cambridge: Cambridge University Press.
- Ranis, G., & Fei, J. C. H. (1961). A Theory of Economic Development. *The American Economic Review*, 51(4), 533-565.
- Rodrigue, J. P., Comtois, C., & Slack, B. (2006). *The geography of transport systems*. London: Routledge.
- Stark, O., & Bloom, D. E. (1985). The New Economics of Labor Migration, *American Economic Review*, 75(2), 173-178.
- Todaro, M. P. (1976). *Internal migration in developing countries: a review of theory, evidence, methodology and research priorities*. Geneva : International Labour Office.
- United Nations, Department of Economic and Social Affairs, Population Division. (2011). *Trends in International Migrant Stock: Migrants by Age and Sex*. Retrieved from <http://esa.un.org/MigAge/index.asp?panel=4>

- Vogler, M., & Rotte, R. (1998). Determinants of International Migration: Empirical Evidence for Migration from Developing Countries to German. *IZA Discussion Paper*, No. 12. Retrieved from <http://ssrn.com/abstract=166340>
- World Bank. Doing Business - Measuring Business Regulations - World Bank Group. Retrieved October, 2012, from <http://www.doingbusiness.org/>
- World Economic Forum. Global Competitiveness Report. Retrieved October, 2012, from <http://www.weforum.org/en/initiatives/gcp/index.htm>