ECONOMICS BULLETIN

The European Union and its new neighbors: an estimation of migration potentials

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Abstract

This paper provides a first quantitative assessment of the migration potential involving the enlarged EU and its new neighbors. Based on new theoretical developments in migration theories, it develops an empirical model which highlights the main migration determinants in the EU. As a next step, the model is estimated with the Hausman and Taylor as well as the GMM panel data estimators. The observed/fitted migration ratios are subsequently calculated from an out−sample technique. Results show that there is still a significant migration potential from Maghreb countries towards Southern European countries. A second significant potential concerns the new Eastern neighbors with regard to Germany and Eastern EU countries.

We are grateful to Robert Shelburne, Ralph Heinrich and Rolf Traeger (United Nations, Economic Commission for Europe) for helpful comments and suggestions.
Citation: Péridy, Nicolas, (2006) "The European Union and its new neighbors: an estimation of migration potentials." *Economics Bulletin,* Vol. 6, No. 2 pp. 1−11
Submitted: December 13, 2005. **Accepted:** February 8, 2006.
URL: http://www.economicsbulletin.com/2006/volume6/EB−05F20010A.pdf

1. Introduction

On May 1, 2004, the enlargement of the European Union (EU) to Central and Eastern European countries (CEECs) pushed its frontiers away, further east and south. It now faces new neighbors, which are first Russia and the Western Newly Independent States (WNIS), i.e. Belarus, Moldova and Ukraine. Southern Mediterranean countries (SMCs) are also included in the new neighbor group, since the EU enlargement to Malta and Cyprus.

Taken together, these new neighbors add up to 410 million inhabitants. It is almost as much as the enlarged EU-25 (475 million people). However, the new neighbors face a GDP per capita which barely exceeds one-tenth of the EU-25.

Given these differences in living standards, the European Commission has initiated the European Neighborhood Policy (ENP), in order to promote economic integration between the EU and its new neighbors. This policy's final objective is to achieve a large single market with the free movement of goods, services, capital and also people (European Commission, 2003, 2005).

At the same time, EU citizens and policy makers have become increasingly concerned with migration flows into the EU originating from low and middle income countries (including these new neighbors). This concern is due not only to the ENP, but also because migration patterns have undergone significant changes in the past decade. In particular, the number of asylum applications has almost doubled during this period, and the proportion of unskilled migrants has also sharply increased (OECD, 2005; Pederson et al., 2004).

Given the lack of quantitative studies concerning the migration aspect of the ENP, the analysis proposed here is a first attempt to assess the migration potential between the new neighbors and the EU. Based on new developments in migration theory, this paper provides first a theoretical framework which simultaneously includes traditional and new migration determinants, such as border effects, welfare magnets or policy regulations. As a next step, an empirical model is implemented in order to calculate the migration potential from the new neighbors into the EU. This can be achieved through out-sample predictions from Hausman and Taylor as well as dynamic GMM estimators.

2. A theoretical model on migration determinants

In recent years, migration theory has undergone a considerable renewal. This renewal was first initiated by Borjas' (1987) pioneer work on self-selection. It has subsequently been extended or complemented by taking into account new factors which explain the migration decision. Several of them are of particular importance for the EU case. The first is welfare magnets (Borjas, 1999). It relies on the idea that once migrants are self-selected, they choose to cluster in the countries where the public assistance is the highest.

Particular attention has also been given to migration costs. Specifically, it has been shown that border effects play a significant role in the migration decision (Helliwell, 1997; Hunt and Mueller, 2004). As a result, it is expected that all things being equal, crossing a frontier strongly reduces migration compared to moving within a country. Human or business networks are an additional new migration cost recently included in migration theory (Lalonde and Topel, 1997). They simply reflect the fact that people lose some family, friends or business ties when migrating. This cost can be reduced if the migrant is able to meet part of his family abroad, or if he has developed business links in the destination country.

Finally, migration policies can also be introduced into migration theories: for example, it is expected that policy makers wish to control the number of migrants into the destination country through quotas, or select them according to the labor market's needs (Benhabib, 1996).

The model developed below takes into account the new developments briefly described above. Its presentation follows Borjas' spirit and is close to Hatton and Williamson (2005) or Clark and al. (2002), but extends this work by including additional migration costs, such as border effects, business ties as well as specific monetary costs (cost of living) or indirect costs (unemployment).

Basically, the decision of individual i in source country s to migrate to destination country d (m_{isd}) depends on the earning difference between the destination and the source country, net of the migration costs.

$$m_{isd} = (W_{id} + T_{id}) - (W_{is} + T_{is}) - C_{isd} \quad (1)$$

W_{id} and T_{id} correspond to the destination country's wages and social transfers for individual i; in the same way, W_{is} and T_{is} reflect the source country's wages and transfers, whereas C_{isd} denotes the migration costs born by individual i who migrates from country s to country d.

$$\begin{aligned} W_{id} &= \alpha_d + \beta_d S_i \\ W_{is} &= \alpha_s + \beta_s S_i \end{aligned} \quad (2)$$

Wages are assumed to include two components: an average base for workers (α_d ans α_s) as well as a component which depends on returns to skills (β_d and β_s). It is also assumed that wages have means and variances respectively equal to μ_{wd}, μ_{ws}, σ_{wd}, σ_{ws} and that Cov(W_{id}, W_{is})>0.

Migration costs (equation 3) depend first on direct and indirect location costs (C_{sd}), such as the geographic distance between the source and the destination country (D_{sd}), the difference in languages between the two countries (L_{sd}), the country difference in the cost of living (H_{sd}), border effects (B_{sd}), country differences in unemployment rates (U_{sd}) as well as the lack of business ties (N^B_{sd}). All these costs are assumed to be the same for all the individuals. In addition, there are individual-specific costs (C_{isd}), which generally refer to the lack of family abroad or other psychic costs. These costs are supposed to have a mean and a variance respectively equal to μ_n, and σ_n. Finally, migration policies (P) may also be introduced in the migration cost variable (P_s, P_d), since a restrictive home or destination country's policy implies additional costs (queuing, monetary costs, etc.). It is supposed here that the destination country's migration policy is not skill-selective, as in the EU. As a result, and for empirical purposes, P_d is an exogenous variable.

$$C_{isd} = C_{sd}(D_{sd}, B_{sd}, L_{sd}, H_{sd}, N^B_{sd}, U_{sd}) + C_{isd} + P(P_s, P_d) \quad (3)$$

Substituting (2) and (3) into (1) and summing for all individuals, the emigration rate between the source and the destination country may be written as:

$$M_{sd} = 1 - \Phi\left(\frac{-\mu_{wd}+\mu_{ws}-T_d+T_s+C_{sd}(D_{sd},B_{sd},L_{sd},H_{sd},N_{sd}^B,U_{sd})+P(P_s,P_d)+\mu_n}{\sqrt{\sigma_{wd}^2+\sigma_{ws}^2-2\sigma_{ws}\sigma_{wd}+\sigma_n^2}} \right) \quad (4)$$

Where Φ is a standard normal distribution.

The calculation of the migration function's partial derivatives provides the following results. First, the emigration rate increases with the destination country's average income and social transfers; in the same way, it decreases with the source country's income and transfers. It decreases as well with all migration costs. In addition, in line with Borjas' self-selection models, migration is an inverse U-shape function of the source country income inequality, provided that the destination country is richer and initially more income unequal than the source country[1]. In the same way, migration is an inverse U-shape function of the destination country's income inequality, provided that this country is richer but initially more equal than the source country[2]. As a consequence, it may be shown that if the destination country is richer and the source country initially more equal ($\sigma_{ws} < \sigma_{wd}$), then migration first increases with the source to destination country's income inequality (σ_{ws}/σ_{wd}), up to the point where $\sigma_{ws} = \sigma_{wd}$. Beyond this point, the source country becomes more unequal ($\sigma_{ws} > \sigma_{wd}$) and migration decreases.

3. The empirical model and the calculation of migration potentials

The theoretical model developed above makes it possible to derive the corresponding empirical model:

$$\begin{aligned} M_{sdt} &= a_0 + a_1\frac{Y_{dt}}{Y_{st}} + a_2\frac{\sigma Y_s}{\sigma Y_d} + a_3\left[\frac{\sigma Y_s}{\sigma Y_d}\right]^2 + a_4\frac{T_d}{T_s} + +a_5 POV_s \\ &+b_1 D_{sd} + b_2 B_{sd} + b_3 L_{sd} + +b_4\frac{H_d}{H_s} + b_5\frac{Ud}{U_s} + b_6 N_{sdt}^B + b_7 N_{sdt}^P + +b_8 P_{dt} + b_9 P_{st} \\ &+\alpha_s + \beta_d + \gamma_t + \varepsilon_{sdt} \end{aligned} \quad (5)$$

The dependent variable M_{sdt} is the gross emigration rate into the 18 OECD members' EU destination countries[3], from 67 source countries[4], during the period 1993-2002. The emigration rate is calculated as the migration flows from country s to country d as a proportion of the source country's population. Statistical data are collected from OECD

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[1] Indeed, if $\mu_{wd} > \mu_{ws} + T_s - T_d + C_{sd}(D_{sd},B_{sd},L_{sd},H_{sd},N_{sd}^B,U_{sd}) + P(P_s,P_d) + \mu_n$ and $\sigma_{wd} > \sigma_{ws}$, then $\frac{\delta M_{sd}}{\delta\sigma_{ws}} > 0$ up to $\sigma_{ws}=\sigma_{wd}$;

[2] In this case, if $\sigma_{wd} < \sigma_{ws}$, then $\frac{\delta M_{sd}}{\delta\sigma_{wd}} > 0$ up to $\sigma_{wd}=\sigma_{ws}$. For additional details, refer to Hatton and Williamson (2005).

[3] These are each EU-15 country, with Belgium and Luxembourg accounting for a single country, in addition to Poland, Hungary, the Czech and the Slovak Republic.

[4] They include the 18 EU countries mentioned above as well as the USA, Canada, Mexico, Turkey, Israel, Japan, Australia, New-Zealand, China, South Korea, Hong-Kong, Taiwan, Singapore, Malaysia, Philippines, Thailand, India, Brazil, Chile, Argentina, Gulf countries and the new neighbors described in the introduction.

(2005) and CARIM (2005). Given that some authors suggest using the stock of migrants instead of the flows (Brucker and Schroder, 2005), we will also use migrant stocks in the calculation of an alternative dependent variable.

The first line in equation (5) corresponds to the income and transfers migration determinants. The first term reflects the destination to source country's GDP per capita (purchasing power parity adjusted), with a_1 expected to be positive. The parameters a_2 and a_3 refer to the impact of income inequality, measured by the Gini coefficient of household income or consumption in each country (source: United Nations 2005). As stated previously, it is expected that a_2 and a_3 are positive and negative respectively. The following term in line 1 denotes welfare transfers in the destination country as a proportion of the source country ($a_4>0$). It is measured by the total public spending offered in each country. The corresponding data come from the Luxembourg income study (LIS, 2005). Finally, line 1 in equation (5) also includes a poverty constraint (*POVs*). The reason for introducing this variable is the following: we have shown previously that the lower the income in the source country, the higher the migration. However, when the income level is actually too low, people cannot migrate any longer, simply because they cannot bear the monetary migration costs of migrating. As a consequence, a_5 is expected to be negative.

The second line includes the various migration costs aforementioned. The bilateral distance between countries s and d has been calculated from a index of inter-city distances, weighted by the share of each city in the overall country's population (CEPII, 2004). This weighted distance index presents the advantage of taking into account the spatial distribution of the population within each country.

Border effects are measured by a dummy which is equal to zero for migration within countries (internal migrations) and unity for migration across countries (international migrations). The inclusion of this variable requires the calculation of internal distances and internal migrations. The former is directly derived from the CEPII distance index, in the same way as international distances, whereas the latter is measured from the internal migration data provided by Eurostat (2005) and OECD (2000).

The difference in languages is also proxied by a dummy variable, which is equal to zero if two countries speak the same language, and unity otherwise.

The cost of living ratio is measured as the total cost of living in the main cities in each country (the statistical source is Mercer, 2005). Identically, the unemployment ratio accounts for the difference in unemployment rates between the destination and the source country. The data is derived from ILO (2005).

The following variables in equation (5) correspond to business or private ties (N^B_{sdt} and N^P_{sdt}). The former is proxied by the total bilateral trade between country s and country d. It is expected that the higher the trade flows between these countries, the closer the business links and as a result, an ensuing higher level of migration ($b_6>0$). In the same way, private networks are measured by the lagged stock of migrants. For these two variables, the data is derived from OECD (2005) and Source OECD (2005) respectively.

The final variables included in line 2 correspond to policy regulations. With regard to the source country's policy, it is proxied by the index of civil and political deprivation of rights (the statistical source is Freedom House, 2005). It is generally expected that the deprivation of freedom may encourage people to escape from their home country. As a result, b_9 is expected to be positive. Turning to the destination country's policy regulation, it is measured by two alternative proxies: the first is the total number of residence permits delivered by each destination country, as a proportion of the world population (source: OECD, 2005). The higher this number, the less restrictive the migration policy and thus the higher the migration ($b_8>0$). As an alternative, we also use a dummy which is equal to one for migration flows within the European Economic Area (EEA), because only this area provides the free movement of people. Conversely, the proxy is equal to zero for all migration flows across the EEA frontier.

The final line in equation (5) includes the specific effects related to the source and the destination country as well as time effects. These effects are expected to take into account any omitted variable. They may be considered as fixed or random depending on the econometric specification of the model.

Preliminary estimations with the Within estimator provide significant Wald tests (refer to the note in Table 1). This means that the specific effects referred to previously are all significant at the 1% level. However, the Within estimator cannot be used in the final model, since there are many time-invariant variables, especially migration costs. Given that the Hausman test indicates a correlation between the residuals and some independent variables, the standard GLS or FGLS random effect estimators can neither be used in the final estimation. In order to solve this problem, we suggest using the Hausman and Taylor estimator, as also recommended by other authors in this case (Egger, 2004, Greene, 2003). Its main advantage is to make the estimation of the time-invariant parameters possible without any bias due to the correlation of the residuals.

Results are presented in Table 1. All the parameters are significant at the 5% level and present the expected sign, with the exception of the source country's policy regulation, which shows a negative sign. This however, may be explained by the fact that the deprivation of freedom may impede people from escaping their countries, especially because this deprivation is very often supplemented by police controls or fear policies.

All the other variables show the expected sign: an increase in the destination to source country's GDP ratio increases migration. In the same way, a rise in the public spending ratio increases migration into the destination country. Moreover, the source to destination country's income inequality ratio first pushes migration up, before reducing it. As a result, a_2 and a_3 are respectively positive and negative, as theoretically expected. Migration costs also matter, since the parameters corresponding to distance, border, differences in languages, differences in unemployment or in the cost or living are all significant and negative. In addition, both private and business networks increase migrations, by reducing migration costs. Finally, the destination country's migration policy also increases migration as the number of residence permits delivered to the migrants increases. The alternative HT estimation with the policy dummy provides very similar results.

The last two columns in Table 1 provide an estimation of the model with the stock of migrants used in the calculation of the emigration rate. Since the lagged stock of migrants is also included as an independent variable (which reflects human networks), the model becomes dynamic. In order to tackle the problem of the correlation between the residuals and some independent variables, the Arrelano, Bond and Bover's GMM estimator has been implemented (Arellano and Bond, 1998; Arellano and Bover, 1995). The sign and the significance of the parameters are very close to those provided by the static HT model and thus corroborate the results found above.

The final step consists in calculating the EU migration potential from the new neighbors. This has been first carried out from the dynamic GMM model (Table 2). The choice of the GMM as the reference model is motivated by the fact that migration stocks are generally more stable over time than migration flows, which can undergo more important variations from one year to another. However, as a sensitivity analysis, the potential of migration flows has also been calculated from the HT model (Table 3). Results are not significantly different, although slightly more volatile during the time period considered, as expected[5].

Tables 2 (Table 3) provides the actual/fitted migration stock (flows) ratio in percent. This ratio is used as a measure for the migration potential between each source and destination countries. It has been calculated with the out-sample technique which is very often used in international trade or migration models (Péridy, 2005, Alvarez et al., 2003). Several features emerge from this Table. First, there is a significant migration potential from Maghreb countries to Southern European countries, especially France, Spain and Italy. For these countries, the actual stock of migrants from the Maghreb barely exceeds 50% of the fitted values. This result is very important. It shows that although the stock of migrants from the Maghreb is already the most important in these Southern European countries (given the geographic and the language proximity as well as the significant differences in the living standards and unemployment), there is still a large potential for an additional increase. The fact that the actual migration stock (and flows) from these countries has not reached the fitted levels may at least partly be due to the restrictive migration policy implemented by France, Spain and Italy in the past decade, in order to control migration flows from these countries[6].

Germany, Belgium, the Netherlands and the UK are also facing a significant migration potential from Maghreb countries, but to a lesser extent. Conversely, the observed migration stocks or flows from the Maghreb to Northern (and Eastern) European countries are generally close to the fitted values. This means that there is no potential for additional migration into these countries. This may be explained by much less restrictive specific migration policies in the past decade.

A second group of source countries is made of Mashrek countries (Egypt, Jordan, Lebanon, Syria). For these countries, the observed to fitted migration ratios are generally close to 100% or above. This suggests that there is also no migration potential from these countries. The only exception concerns migration from Egypt to Italy (82%) and from Lebanon to several EU countries (France, Germany, Belgium, Sweden and Denmark).

Israel is a specific country for which the observed/fitted migration ratios are above 100%. This suggests that there are more actual migrants from Israel into the EU than predicted. This may be easily explained by historical factors. In particular, although the Israel policy

[5] In order to save space, results are not presented for each year. The complete set of results is available upon request.

[6] As already stated, the destination country's policy variable included in the model reflects the total number of residence permits which are delivered by each destination country for all source countries taken together. Hence, it does not reflect the number of permits delivered to each source country specifically. This is why the difference between the fitted and the observed migration stock in Southern European countries, originating from Maghreb countries, may be explained by this specific migration policy.

encourages return migration, there are still a significant number of people originating from Israel living in EU countries.

Finally, Russia and the WNIS show an actual/fitted migration ratio which is above 100% with Northern European countries. Conversely, it is well below 100% with regard to Germany and the WNIS to a lesser extent. It is close to 100% for the other EU countries.

To sum up, it is striking to observe that there are two significant migration potential areas: the first concerns Maghreb countries with regards to Southern EU countries. The second is Russia and the WNIS with regards to the CEECs and above all Germany. This means that unless there is a rapid convergence process between these new neighbors and the EU, relaxing the specific migration policies in some EU countries may significantly increase migration flows in the areas described above.

Another striking feature is that the migration potential also differs according to the EU destination countries, whatever the source country: as a matter of fact, the last column of Tables 2 and 3 indicates that Northern EU countries have generally above-average actual/fitted migration stock ratios, whereas France, Germany and Italy show lower than average ratios. As already said, this may be explained by the fact that these latter countries are closer to the new Southern or Eastern neighbors. As a result, they have implemented tighter migration policies in order to control migration flows.

These results challenge the EU policy in several ways: firstly, it seems crucial to provide more economic cooperation between the EU and its new neighbors as a means of reducing the gap in the living standards and the macroeconomic performance (unemployment). This would reduce the migration pressure (potential) to some extent. At the same time, it seems important for EU countries to coordinate their migration policies, with common objectives concerning illegal migration, skilled migrants, etc… As a final step and in the long run only, the EU will be in a position to liberalize migration flows, as stated in European Commission (2003).

References:

Alvarez-Plata, P, H. Brücker, B. Silverstovs (2003) “Potential Migration from Central and Eastern Europe into the EU-15, Report for the European Commission, DG Employment and Social Affairs

Arellano, M. and S. Bond (1998) "Dynamic Panel Data Estimation Using DPD98 for Gauss: A Guide for Users" CEMFI, Madrid

Arellano, M. and O. Bover (1995) "Another Look at the Instrumental Variable Estimation of Error Component-Models, *Journal of Econometrics*, 68: 29-51

Benhabib J. (1996), "On the Political Economy of Immigration", *European Economic Review*, 40(9): 1737:43.

Borjas, G. (1987) "Self Selection and the Earnings of Immigrants", *American Economic Review*, 77: 531-553.

Borjas, G. (1999) "Immigration and Welfare Magnets", *Journal of Labor Economics*, 17(4): 607-637.

Brucker, H. and J.H. Schroder (2005) "International Migration with Heterogeneous Agents: Theory and Evidence", mimeo, DIW Berlin.

CARIM (2005), Mediterranean Migration, 2005 Report, Euro-Mediterranean Consortium for Applied Research on International Migration, Robert Schumann Center, European University Institute.

CEPII (2004) Database on CEPII's distances measures, www.cepii.fr.

Clark, X., J. Hatton and J. Williamson (2002) "Where do US Immigrants Come From and Why", NBER Working Paper 8998.

Egger, P. (2004) "On the Problem of Endogenous Unobserved Effects in the Estimation of Gravity Models", *Journal of Economic Integration*, 19(1): 182-191.

European Commission (2003) "Wider Europe-Neighborhood: A new framework for relations with our Eastern and Southern neighbors", COM(2003) 104 final.

European Commission (2005). European Neighbourhood Policy; The Next Steps. IP/05/236, 2 March 2005.

Eurostat (2005), Regio dataset, Population statistics.

Freedom House (2005), Freedom in the World Rating Table, Civil and Political Rights, 1972-2004.

Greene W. (2003), Econometric Analysis. New York: Prentice-Hall International. 5th edition.

Hatton, T. and J. Williamson (2005) "What Fundamentals Drive World Migration?", in: G. Borjas and J. Crips (eds.), *Poverty, International Migration and Asylum*, Hampshire, Palgrave-MacMillan, pp.15-38.

Helliwell, J. (1997) "National Borders, Trade and Migration", *Pacific Economic Review*, 2(3), 65-85.

Hunt, H. and R. Mueller (2004) "North American Migration: Returns to Skill, Border Effects and Mobility Costs", *The Review of Economics and Statistics*, 86(4): 988-1007.

ILO (2005), Laborsta, International Labor Office database on labor statistics, International Labor Organization Bureau of Statistics.

Lalonde, R. and H. Topel (1997) "Economic Impact of International Migration and the Economic Performance of Migrants", in: M. Rosenzweig (ed), *Handbook of Population and Family Economics*, vol. 1B, Amsterdam: Elsevier, 799-850.

LIS (2005), Social transfers, basic descriptive, Luxembourg: Luxembourg Income Study.

Mercer (2005), Worldwide cost of living survey, London: Mercer, Human Resource Consulting.

OECD (2000), Perspectives de l'emploi de l'OCDE 2000 , Annual Report, Paris: OECD.

OECD (2005), Trends in International Migrations, SOPEMI, Annual Report, 2004, Paris: OECD Publishing.

Pederson, J., M. Pytlikova and N. Smith (2004) "Selection or Network Effects? Migration flows into 27 OECD Countries, 1990, 2000", IZA Discussion Paper 1104.

Péridy, N. (2005), Trade Prospects of the New EU Neighborhood Policy: Evidence from Hausman and Taylor's Models. *Global Economy Journal*. 5(1): 1-23.

Source OECD (2005) Monthly International Trade, Total Trade by Partner Country, annual, vol.7, 2005.

United Nations (2005), World Development Report, Annual Report, UN: United Nations Development Program.

Table 1: Estimation Results

Description	Variable	HT (1)	HT(2)	GMM(1)	GMM (2)
GDP	Y_{dt}/Y_{st}	0.0051***	0.0048***	0.0069***	0.0075**
Gini	$\sigma Y_{dt}/\sigma Y_{st}$	0.102**	0.098**	0.098**	0.087**
Gini^2	$(\sigma Ydt/\sigma Ys)^2$	-0.070**	-0.059**	-0.93**	-0.100***
public spending	T_d/T_s	0.828D04***	0.850D04***	0.989D04***	0.942D-04***
Poverty constraint	POV_s	-0.0478***	-0.0466***	-0.0487***	-0.0465***
Distance	D_{sd}	-0.00014***	-0.00014***	-0.00015***	-0.00015***
Border effects	B_{sd}	-4.542***	-4.545***	-1.462***	-1.511***
Destination country's migration policy	P_{dt} (residence permits)	3.399***		7.591***	
	P_{dt} (dummy)		0.440***		0.099****
Source country's migration policy	P_{st}	-0.0214***	-0.0218***	-0.0077*	-0.0103**
Differences in language	L_{sd}	-0.3776***	-0.3422***	-1.9833***	-1.8705***
Cost of living	H_d/H_s	-1.351***	-1.349***	-1.015***	-1.136***
Unemployment	U_d/U_s	-0.1096***	-0.1033***	-0.0907***	-0.0934***
Business ties	N^B_{sdt}	0.251D-05***	0.248D-05***	0.189D-05***	0.193D-05***
Human networks	N^P_{sdt}	103.663***	107.711***	0.0894***	0.0899***
Constant		-5.096***	-5.132***	-3.054***	-3.096***
R2 (adjusted)		0.893	0.888	0.993	*0.993*
number of observations		12060	12060	10248	*10248*
Hausman and Taylor test (theta)		0.99	0.99	-	-

***) significant at a 1% level; **) significant at a 5% level; *) significant at a 10% level.
LM test: 22510.1***
Wald tests: country s (αs): 2356.5***; country d (βd): 10585.7***; time effect (γt): 18.3*
Hausman test: 665.8***

Table 2: actual/fitted stocks of migrants in EU countries from the new neighbors (%)

	Israel	Algeria	Morocco	Tunisia	Egypt	Jordan	Lebanon	Syria	Russia	Ukraine	Moldavia	Belarus	All
France	85,8	57,1	50,7	60,5	92,7	97,7	66,3	97,2	99,1	120,9	101,5	111,9	92,1
Belgium	122,8	103,4	67,3	86,4	108,5	117,1	95,9	126,4	114,2	126,2	106,3	117,4	109,8
Germany	95,3	80,7	68,3	68,6	90,2	97,3	77,4	96,9	78,0	77,3	76,7	88,1	81,1
Italy	104,3	75,6	54,2	60,9	82,8	105,9	100,1	115,9	89,0	80,8	102,3	112,0	84,7
Netherlands	121,3	96,4	57,7	89,6	107,3	115,8	110,7	125,0	102,8	115,9	121,0	131,2	103,3
UK	101,9	87,9	81,0	76,7	96,0	96,9	91,3	107,4	106,1	103,3	101,1	111,7	99,4
Ireland	119,3	111,6	103,6	101,4	124,2	114,0	108,6	123,1	122,6	142,9	119,0	128,8	122,3
Denmark	118,9	103,5	85,3	93,2	111,1	113,6	84,3	123,1	120,7	123,0	118,9	130,3	114,1
Finland	116,8	110,9	102,2	101,3	121,7	111,7	106,0	121,0	91,9	108,9	116,8	128,1	105,6
Sweden	120,9	104,7	96,0	94,2	112,6	115,3	70,3	124,9	106,9	137,1	120,9	132,9	112,0
Austria	125,1	96,9	88,5	86,3	110,2	119,3	113,3	128,8	126,2	150,2	124,7	134,8	119,8
Spain	109,5	82,2	50,1	68,2	90,6	104,0	98,1	113,5	125,8	96,9	107,3	117,2	102,6
Greece	121,9	109,7	100,7	100,7	90,5	116,2	69,7	85,5	95,5	94,9	96,2	104,7	96,4
Czech Rep	112,6	107,9	99,4	98,4	117,4	107,4	102,0	116,3	100,7	76,7	74,4	89,3	101,7
Hungary	93,7	116,1	106,8	107,1	117,9	107,4	102,0	96,8	101,4	93,4	86,8	87,7	104,5
Poland	101,2	106,2	97,7	97,0	108,3	96,3	91,1	105,8	90,7	93,4	76,1	69,0	96,5
Slovak Rep.	112,8	116,5	107,3	107,4	118,1	107,7	102,2	116,5	94,3	100,8	77,5	87,4	104,0
Tot. EU	110,8	98,1	83,3	88,1	105,9	108,4	93,5	113,2	103,9	108,4	101,6	110,7	102,9

Table 3: actual/fitted flows of migrants in EU countries from the new neighbors (%)

	Israel	Algeria	Morocco	Tunisia	Egypt	Jordan	Lebanon	Syria	Russia	Ukraine	Moldavia	Belarus	All
France	86,5	74,0	69,2	69,7	92,1	96,0	71,4	96,3	97,4	116,2	99,1	108,0	93,7
Belgium	118,4	94,7	64,7	86,2	106,3	113,1	94,1	122,6	110,4	120,7	102,9	112,6	105,9
Germany	92,2	80,4	70,3	71,4	88,5	93,9	77,7	94,1	70,9	73,3	78,1	86,4	77,5
Italy	101,1	77,6	58,3	63,8	73,5	102,6	97,4	112,4	88,4	82,2	99,3	107,5	83,0
Netherlands	118,4	95,7	69,4	89,8	106,2	113,2	108,0	121,8	101,1	100,0	117,5	127,0	100,9
UK	99,7	87,6	81,8	78,7	95,1	95,2	90,3	105,2	102,9	100,6	98,6	107,7	97,5
Ireland	117,3	110,1	103,2	100,8	123,3	112,3	107,1	121,8	120,1	139,6	116,5	125,6	120,4
Denmark	116,3	102,4	86,1	93,1	110,0	111,2	85,0	121,2	117,6	119,3	115,6	126,1	111,9
Finland	114,8	109,8	102,1	100,8	120,8	109,9	104,6	119,5	93,3	114,8	114,2	128,0	106,5
Sweden	117,4	102,9	95,4	93,5	110,8	112,2	80,2	122,0	100,1	131,7	116,8	127,7	107,9
Austria	121,1	95,8	88,7	86,7	108,2	115,7	110,1	125,5	122,1	144,5	120,1	129,5	116,6
Spain	105,8	81,1	56,5	72,0	107,9	100,9	95,8	110,2	120,8	87,7	103,6	112,3	102,9
Greece	119,4	108,6	100,8	100,4	82,5	114,1	74,0	87,1	86,7	91,2	95,9	103,5	91,1
Czech Rep	111,5	107,5	99,8	98,6	117,8	106,6	101,5	115,7	91,0	82,3	77,8	90,4	98,8
Hungary	85,1	115,6	107,1	106,8	117,8	105,3	101,4	97,3	104,9	85,7	88,0	87,7	104,7
Poland	101,0	105,9	98,5	97,3	108,3	96,4	91,7	105,7	92,8	79,0	79,5	74,1	95,7
Slovak Rep.	111,8	115,9	107,6	107,2	118,0	107,0	101,8	116,0	95,5	93,0	80,4	88,6	103,4
Tot. EU	108,1	98,0	85,9	89,2	105,1	106,2	93,7	111,4	100,9	103,6	100,2	108,4	101,1