

Migration from MENA countries to the EU: A Quantitative assessment of recent patterns, policies and prospects

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Introduction

International migration statistics point out high and increasing migration levels from Middle East and North African (MENA) countries toward the EU. At the same time, EU citizens and policy-makers have become increasingly concerned about illegal immigration as well as the increasing number of unskilled migrants originating from developing countries. This has led to the recent implementation of more restrictive and more selective migration policies, complemented with the harmonization of national policies.

This paper provides a quantitative assessment of migration patterns, policies and prospects with regard to flows from MENA countries to the EU. It first intends to identify the migration determinants which explain migration flows from MENA countries to the EU. In particular, the impact of the EU migration policy is investigated and quantified. This paper is also aimed at comparing the observed migration flows to their predicted (fitted) values.

Based on the new databases developed by CARIM (2005)

Abstract

This paper provides a quantitative assessment of migration patterns, policies and prospects with regard to flows from Middle East and North African (MENA) countries to the EU. Based on recent developments in migration theories, it develops an empirical model which includes both traditional and new migration determinants. The model is estimated by using the Hausman and Taylor panel data estimator. These estimations are also used for the calculation of the migration potential between MENA countries and the EU. Results show first that the high migration rates recorded for Maghreb countries and Lebanon are primarily explained by their low migration costs, their low GDP per capita and public transfers, as well as by their young population. The role of income inequality and skills is also highlighted. Secondly, results also point out the accommodating migration policies implemented in Southern European countries, especially with regard to Maghreb countries. These policies have led to migration levels well above their predicted value for these countries. Conversely, Northern European countries still face a deficit of migrants from MENA countries (compared to the fitted levels). These results question the coherence of the national migration policies in Europe.

Keywords: MENA countries, European Union, migration, migration policy, panel data, Hausman and Taylor.

Résumé

Dans ce travail, on présente une évaluation quantitative des modèles des politiques et des perspectives en matière de migration qui concernent les flux des pays du Moyen-Orient et de l'Afrique du Nord (MENA) vers l'Union Européenne. En s'appuyant sur les développements récents des théories migratoires, un modèle empirique a été mis au point incluant à la fois les déterminants migratoires traditionnels et nouveaux. Ce modèle est estimé en utilisant les estimateurs des données de panel de Hausman et Taylor. La même méthode est aussi employée pour calculer le potentiel migratoire entre les pays MENA et l'UE. Les résultats montrent, tout d'abord, que les taux migratoires élevés enregistrés pour les pays du Maghreb et le Liban s'expliquent, en premier lieu, par les faibles coûts migratoires, une valeur modeste du PIB par tête et des transferts publics limités ainsi que par la jeune population qui les caractérisent. Également, l'accent est mis sur l'inégalité des revenus et des compétences. En plus, les résultats mettent aussi en évidence les politiques migratoires accommodantes adoptées dans les pays de l'Europe du sud, tout particulièrement à l'égard des pays du Maghreb. Ces politiques ont mené à des niveaux migratoires qui ont de loin dépassé les valeurs prévues pour ces pays-ci. En revanche, dans les pays de l'Europe du nord les migrants provenant des pays MENA se situent encore bien au-dessous des niveaux attendus. Ces résultats ne font que remettre en question la cohérence des politiques migratoires nationales dans le contexte européen.

Mots-clés : pays MENA, Union Européenne, migration, politique migratoire, données de panel, Hausman et Taylor.

and OECD (2005), the first section describes the recent migration flows from MENA countries to the EU. It also provides a picture of the new developments in the EU migration policy and its implications for MENA countries.

The second section provides a theoretical framework for explaining the migration patterns described previously. In this regard, a short survey of recent migration theories makes it possible to identify several migration determinants. These are mainly the differences in income per capita and welfare transfers between the source and the destination countries, the age structure of the source country's population, migration policies as well as various migration costs (the geographic distance, border effects, differences in the costs of living, unemployment rates, etc...). The role of income inequality and skill levels is also investigated.

The impact of these migration determinants is tested empirically in the last section. For that purpose,

an econometric model is estimated through the Hausman and Taylor panel data estimator. The model is also used in order to calculate the migration potential between MENA countries and the EU. This potential is measured by

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Table 1a: Stock of migrants in EU countries, originating from MENA countries*

	Morocco	Algeria	Tunisia	Egypt	Lebanon	Syria	Israel	Jordan	AllMena
France	725782	685658	260622	15974	33278	10826	6033	933	1739106
Spain	333770	23785	909	1567	1012	1403	560	720	363726
Italy	223661	15750	58628	40879	3333	2505	2657	2011	349424
Germany	79838	17308	24243	14477	47827	28679	10219	10435	233026
Netherlands	168400	4013	4117	10982	2861	6663	4933	833	202802
Belgium	83683	7324	3401	820	1081	816	1652		98777
UK	12351	10672	3070	24705	10454	4167	14389	3105	82913
Greece	526	267	231	7448	1277	5552	348	672	16321
Denmark	3226	456	508	637	5361	1037	749	652	12626
Sweden	1475	531	871	662	2238	4801	637	594	11809
Austria	515	330	1194	4721	382	583	1319	291	9335
Finland	613	225	183	210	95	134	316	132	1908
Portugal	778	135	54	115	187	81	131	88	1569
EU-15	1634618	766454	338031	123197	109386	67247	43943	20466	3123342

Source: CARIM (2005)

*Data are unavailable for Ireland. The year of reference is the latest available, generally 2003 or 2004. This note also concerns Table 1b.

the actual/fitted migration ratio, calculated from an out-sample technique.

Several original results are inferred from the model's estimation. First, the high emigration rates recorded for Maghreb countries with regard to the EU are primarily explained by their low migration costs, their low GDP per capita and public transfers, as well as by their young population. Second, these countries also enjoyed an accommodating migration policy from Southern European countries, which made a higher inflow of migrants into these countries possible.

The calculation of migration potentials complements these results. At a global level, it is shown that the observed migration flows from all MENA countries toward the EU are just equal to their fitted values. This means that these flows are globally at a normal level compared to migrations from non-MENA countries to the EU. However, the same analysis conducted at a country level points out a striking geographical disequilibrium: indeed, migration flows from Maghreb countries to Southern European countries are much greater than their predicted (fitted) values, whereas migrations from Mashrek countries are lower than their fitted value, especially toward Northern European countries. These results question the coherence of the current European national migration policies and stress the need for a single EU policy.

1. The EU and MENA countries: an overview of migration patterns and policies

This section is not aimed at describing and analyzing in detail migration flows from MENA countries to the EU. It simply intends to provide some basic features about migration patterns and policies in order to feed the econometric analysis which will be developed in the following sections.

1.1. Recent migration patterns from MENA countries to the EU

Although it is still difficult to obtain accurate migration data and above all to compare data at an international level, there has been significant progress since the recent issue of two international databases: OECD (2005) and CARIM (2005). In particular, the last one specifically focuses on MENA countries. These datasets will be mainly used here for the migration pattern analysis.

As a first feature, the stock of migrants into the EU originating from MENA countries is estimated to be about 3 million people (Table 1a).

However, the distribution of the migrants is very uneven within the EU. As a matter of fact, France alone accounts for more than one half of the total number of migrants (Table 1b). If we add Spain and Italy, these three Southern European countries attract together almost 80% of all migrants originating from MENA countries. On the other hand, Northern European countries (Denmark, Sweden and Finland) barely attract 1% of these migrants. Between these two extremes, Germany, Belgium, the Netherlands and the UK together include about 20% of MENA countries' migrants.

Statistics involving migration flows (Figure 1) strongly correlate the previous results: from the 180,000 migrants coming from MENA countries to the EU in 2002, about 80% go to Southern European countries. Since 1993, these flows have sharply increased (Figure 2): indeed, taking into account the main bilateral flows only (>5000 migrants), the most significant increase involves Moroccan migrants toward Spain and Italy as well as Algerian migrants toward France. Migration flows from Egypt and Tunisia toward Italy have also risen significantly, starting however from low absolute levels.

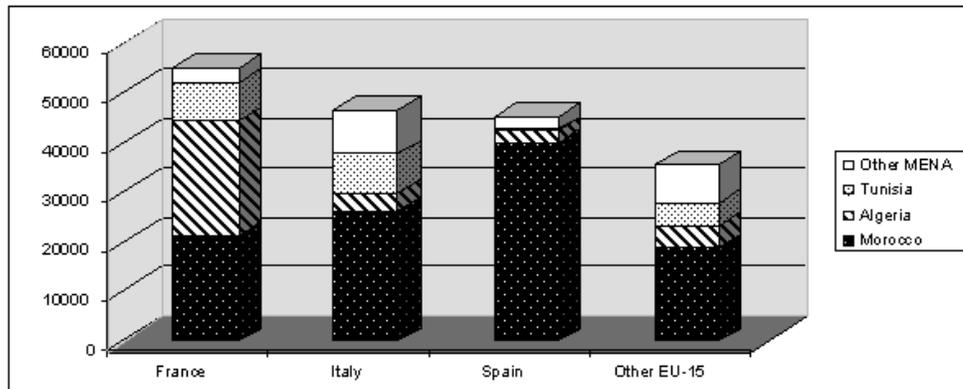
As an additional striking feature, the distribution of the migrants also strongly differs depending on the country of origin: indeed, in terms of stocks or flows, MENA migrants primarily come from Maghreb countries, which account for almost 90% of the overall migrants (Table 1b). In particu-

Table 1b: Stock of migrants as a percentage of the total number of migrants originating from MENA countries

	Morocco	Algeria	Tunisia	Egypt	Lebanon	Syria	Israel	Jordan	AllMena
France	23,24%	21,93%	8,34%	0,51%	1,07%	0,35%	0,19%	0,03%	55,68%
Spain	10,69%	0,78%	0,03%	0,03%	0,03%	0,04%	0,02%	0,02%	11,65%
Italy	7,16%	0,50%	1,88%	1,31%	0,11%	0,08%	0,09%	0,06%	11,19%
Germany	2,56%	0,53%	0,78%	0,46%	1,53%	0,92%	0,33%	0,33%	7,46%
Netherlands	5,39%	0,13%	0,13%	0,33%	0,09%	0,21%	0,16%	0,03%	6,49%
Belgium	2,68%	0,23%	0,11%	0,03%	0,03%	0,03%	0,03%	0,00%	3,16%
UK	0,40%	0,34%	0,10%	0,79%	0,33%	0,13%	0,46%	0,10%	2,65%
Greece	0,02%	0,01%	0,01%	0,24%	0,04%	0,18%	0,01%	0,02%	0,52%
Denmark	0,10%	0,01%	0,02%	0,02%	0,17%	0,03%	0,02%	0,02%	0,40%
Sweden	0,05%	0,02%	0,03%	0,02%	0,07%	0,15%	0,02%	0,02%	0,38%
Austria	0,02%	0,01%	0,04%	0,15%	0,01%	0,02%	0,04%	0,01%	0,30%
Finland	0,02%	0,01%	0,01%	0,01%	0,00%	0,00%	0,01%	0,00%	0,08%
Portugal	0,02%	0,00%	0,00%	0,00%	0,01%	0,00%	0,00%	0,00%	0,05%
EU-15	52,34%	24,54%	11,46%	3,94%	3,50%	2,15%	1,41%	0,66%	100,00%

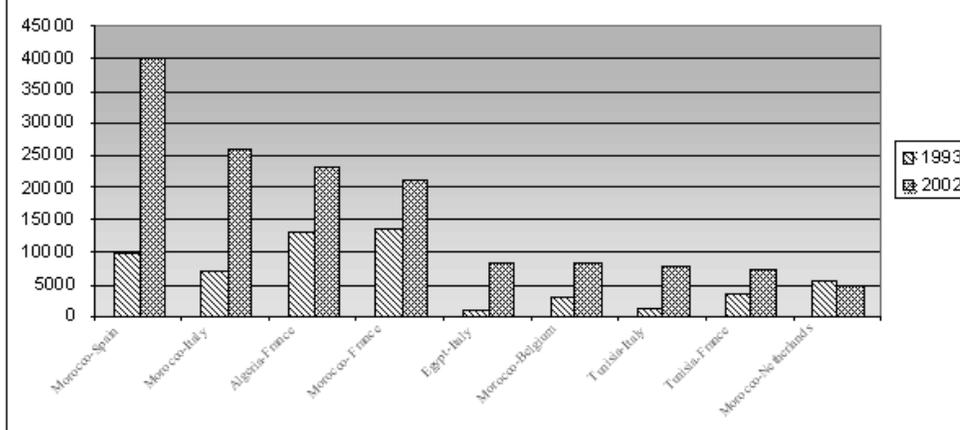
Source: own calculation from CARIM (2005)'s data

Figure 1. Migration inflows into the EU-15, originating from MENA countries (2002)



Source: OECD (2005). Missing data are complemented by national sources.

Figure 2. Main bilateral migration flows in 1993 and 2004



* Bilateral flows > 5000 persons in 2002.
 * Source: OECD (2005) and national sources.

lar, Morocco alone involves more than 50% of all migrants. Conversely, Mashrek countries only provide 10% of the total number of migrants. With regards to these countries, only two bilateral flows (or stocks) account each for more than 1% of the overall migration. They concern migrants from Egypt to Italy as well as from Lebanon to Germany.

Table 2. The distribution of the migrants originating from MENA countries, according to their skills, their labour market participation and their political status (% of the total number of migrants in each country of origin)

	Skilled	Workers	Refugees
Algeria	19,7	61,1	1,4
Morocco	15,3	55,3	0,1
Tunisia	24,6	72,2	0,6
Syria	50,9	50,1	10,5
Jordan	52,6	63,8	1,5
Egypt	41,4	71,0	1,3
Israel	60,9	73,8	0,1
Lebanon	51,8	56,9	6,8

Note: skills migrants are defined as the migrant population aged 15 and over with a first stage or second stage tertiary education; workers are defined as the active migrant population. Refugees are estimated assuming that each asylum country includes the refugees in the overall migrant statistics. Since this is not the case for all of them, these percentages can be slightly overestimated.

Source: own calculations from CARIM (2005) and UNHCR (2005)

The characteristics of the migrant population can be further investigated, especially in terms of skills, labour market participation or political status. In this regard, Table 2 shows that skilled migrants add up to more than half of the total number of migrants for Israel, as well as for Syria, Lebanon and Jordan, although to a lesser extent. On the contrary, the share of skilled migrants is below 25% for Maghreb countries. It can also be observed that for all MENA countries, workers account for more than half of the total number of migrants. This share is the highest for Israel (74%) as well as for Tunisia, Egypt and Jordan to a lesser extent. Turning to the political status of the migrants, the total the number of refugees originating from MENA countries amounts to 68,900, which is less than 1% of the total number of refugees in the world (UNHCR, 2005). In addition, for each MENA country, refugees do not generally account for more than 1% of the total number of migrants, with the exception of Lebanon and above all Syria. In this latter country, refugees represent more than 10% of the overall population of migrants.

Further information is provided by the calculation of emigration rates, i.e. the total number of migrants originating from a given MENA country, as a percentage of that country's population (Table 3). These rates have been calculated first for the overall population (column 1) and for the adult population (above age 15, column 2). Compared to world averages, MENA countries can

Table 3. Emigration rates in MENA countries (%)

	Emigration rate		
	Total	Age > 15	Skilled pop.
Algeria	4,2	6,2	18,0
Morocco	5,2	7,2	19,5
Tunisia	4,4	5,9	21,4
Syria	0,9	1,3	4,4
Jordan	1,4	2,0	3,3
Egypt	0,5	0,7	4,6
Israel	2,9	3,4	5,3
Lebanon	7,5	10,1	25*
World average	5,8	7,0	16,7

* Estimate

Source: own calculations from OECD (2005)

be divided into three distinct groups. As a first group, Mashrek countries show very low emigration rates, with the exception of Lebanon. In particular, migrants account for less than 1% of the overall population in Syria and Egypt. As a second group, Maghreb countries generally present close to average emigration rates. In fact, only Lebanon provides an above average rate. These differences can be explained by several theoretical and empirical factors, which will be developed in the following sections.

The emigration rate can also be calculated for skilled migrants only (column 3). This provides a different picture. Two distinct groups of countries can be identified: the first is Lebanon and Maghreb countries with emigration rates well above average for skilled migrants. On the other hand, Mashrek countries face very low rates. This result complements the one found in Table 2. For instance, with regard to Maghreb countries, we have shown that skilled migrants account for only a small part of the overall number of migrants. However, they account for a more significant part of the total skilled population.

To sum up, with the exception of Lebanon, Mashrek countries are generally closed countries in terms of migration, whatever the level of education of the migrants. Conversely, Maghreb countries and Lebanon are much more open to international migration, particularly for skilled people.

1.2. Recent trends in EU countries' migration policies: what implications for Mediterranean countries?

Since the early 90s, migration policies in EU countries have undergone a significant renewal. This renewal has been motivated by three main reasons: the problem of asylum seekers, illegal immigrants, and changes in the need of labor markets.

Starting with asylum seekers, their number has increased from 190,000 in 1987 to 700,000 in 1992. This increase may be explained first by the political confusion in the former European communist countries, but also by the war in Yugoslavia as well as the inflow of Kurds (Bauer and al. 2000). This massive inflow motivated some EU countries to tighten their asylum policies, especially Germany, France, and the UK. However, some other countries did not restrict their policies at this time, namely Northern European countries. They continued to accept a large number of asylum seekers. From the mid-90s onward, the number of asylum seekers stabilized to about 300,000 each year, with a significant decrease in the share of Eastern and Southern European countries, due to improved political stability in this area. However, the number of asylum seekers increased from specific source countries such as Iraq and Afghanistan, but also the Russian Federation as well as some low income African and Asian countries.

Illegal immigration has also become a major concern for policy makers. Although there is a lack of accurate data, it is generally recognized that the number of illegal migrants

is significant and that it has risen in the past decade. As an example, as of 2003, this number is estimated at 1.2 million in Spain and about 150,000 in the Netherlands (OECD, 2005). This huge number led to tougher government policies to control immigration, but also to develop regularization programs. In this regard, the most striking examples are Southern European countries. Specifically, Italy has implemented four waves of regularization since 1990, which amounted to 1.3 million people, including about 650,000 in 2002. The corresponding figures for Spain are 530,000 regularized people, with 235,000 in 2001. Greece and Portugal also experienced an increase in the number of regularized migrants, respectively 350,000 and 180,000, in 2001.

These figures point out the particular position of Southern European countries. In fact, these countries experienced a dramatic increase in illegal migration inflows, especially from Maghreb countries, but also from low income Latin American or other African countries (mainly into Spain) as well as from Balkan countries (mainly into Italy). These new trends shifted Spain and Italy from net emigration to net immigration nations. Consequently, they have been increasingly concerned about the control of migration inflows, in the same way as the other OECD countries.

The problems with asylum seekers and illegal immigration have urged EU countries to redefine their migration policy (Hatton, 2005; Hatton and Williamson, 2005a; OECD, 2005). The objective is twofold: the first is to tighten controls over migrants as a means of controlling immigration flows; the second objective consists in adopting new measures to enhance immigrants' integration. These two policies combined together are supposed to improve the living standards and the security of legal immigrants (OECD, 2005, p.91).

In order to implement this new policy, several regulations have been implemented. The first is the strengthening of security measures (reinforcement of police and security controls, creation of a common EU dataset on visa applicants and persons seeking refugee status in any EU country, etc.). Secondly, most EU countries have limited immigration by family reunification. Depending on the EU country concerned, this has been carried out through an increase in the age requirement or the income requirement for the relatives, the implementation of compulsory language courses, the issue of temporary rather than permanent residence permits for the relatives, etc.. As a third set of regulations, most EU countries have also decided to modify the conditions for refugee status and accelerate the procedures for processing asylum applications. Basically, these measures aim at rendering the asylum policy more efficient and more restrictive. In particular, it involves a harmonization of regulations, especially within the Schengen area. Finally, specific measures have also been undertaken for better control of irregular immigration flows (reinforcement of border controls, increase in sanctions for illegal migrants, deportation, prosecution of those who employ foreigners illegally, etc...).

Certain southern Mediterranean countries may be especially affected by these new measures, especially Morocco, given the significant number of illegal migrants who cross the Gibraltar strait. However, they should be much more affected by an additional renewal of the EU's migration policy, due to changes in labor market needs. Indeed, in the past decades, there has been an enlarging gap between migration inflows (which concern an increasing number of unskilled persons), and the shortage of skilled labor in the EU. As a result, EU countries have recently shown an increasing interest in developing policies aimed at attracting more skilled workers, while deterring lower skilled ones.

For that purpose, several tools have recently been implemented. The first is the expansion of visas for temporary skilled migrants, especially in the UK and Germany. Secondly, the EU Justice and Internal Affairs Council plan to adopt a recommendation that would facilitate the admission of researchers from non-EU countries (Commission of the European Communities, 2004). In addition, most EU countries have encouraged the admission of valuable foreign students, as a means of taking advantage of the skills acquired by these students. As a countermeasure however, these countries have also set quotas in order to restrict the number of low skilled migrants. It must also be added that although these tools have been carried out on a national basis, the question of a common EU migration policy has been increasingly considered, especially since the issuance of the Green Paper for an EU migration policy (Commission of the European Communities, 2005; Zimmerman, 2004).

In the future, the trend toward a more skill-selective EU migration policy may have significant implications for MENA countries (especially the Maghreb). As shown in the previous section, more than 75% of the migrants from these countries are unskilled. As a result, this category of migrants might be adversely affected by a more restrictive EU policy. However, this problem may be reduced by the progressive declining and ageing populations in Europe. At the same time, skilled migrants could benefit from this policy. In particular, if EU and MENA countries agree on migration on a temporary basis, they could both gain from it: the EU would fill its labor shortages in specific sectors, whereas MENA countries would take advantage of return migration, after appropriate training and skills' acquisition for each migrant (Fargue, 2005).

2. Explaining migration patterns from MENA countries to the EU: from new theories to empirical evidence

In the past two decades, migration theories have undergone a significant renewal, which considerably improves the understanding of migration patterns. In particular, it has made it possible to identify some new migration determinants. This section first provides an overview of these new theoretical developments. Based on this theoretical renew-

al, we subsequently develop an empirical model which explains the recent migration patterns which involve MENA countries and the EU. Specifically, the explanatory variables are measured and discussed for each MENA country before the complete estimation of the model.

2.1. Recent developments in migration theories: a short survey.

Several traditional theories focus on migration determinant¹. The most popular is the Heckscher-Ohlin-Samuelson (HOS) approach. It is based on the idea that if countries differ in their factor endowments only, then trade can alone equalize factor prices. In this case, there is no need for factor mobility. As a result, there is an inverse relationship between trade and migration, which are viewed as substitutes.

As a second traditional theory, human capital models consider migration as a human capital investment. This implies that the higher the returns and the lower the costs, the higher the migration levels. For these models, migration returns generally include the income difference between the source and the destination country.

The "brain drain" approach views migration differently: assuming asymmetric information regarding the skill levels of the migrants, the host country is able to attract the most skilled people from the source country.

Taken together, these traditional theories make it possible to identify a precise macroeconomic relationship between migration and the aforementioned determinants: indeed, migration is assumed to increase with the destination country's mean income (GDP per capita) as well as with the source country's skill level. Conversely, migration is negatively related to the source country's income per capita, migration costs and trade flows.

However, in the past two decades, some new theories have complemented and sometimes questioned the traditional ones. One important contribution concerns self-selection models (Borjas, 1987). It supplements both the human capital and the brain drain approaches by demonstrating that migration decisions depend simultaneously on differences in the mean income between the source and the destination country and on the returns on skill in each country. In this regard, it is shown that if the destination country pays higher returns to skills than the source country, then migration increases with the skill level in the source country (positive selection). Conversely, migration decreases as the skill level increases if the returns to skills are lower in the destination than in the source country (negative selection).

In addition, the self-selection model makes it possible to derive an inverse U-shape relationship between migration and the source to destination country's ratio of income inequality. This result is inferred from two basic assumptions: first, the income is different from one individual to another

¹For an extensive survey, refer to Borjas (1989), Razin and Sadka (1997) or Zimmerman and Bauer (2002).

in each country. This implies that at a macro level, income variances (inequalities) matter for explaining migration; second, the covariance between the income earned in the source and in the destination country is positive. This determines the particular shape of the migration function with regard to income variances in each country. For additional details and a complete mathematical demonstration, refer to Borjas (1987) or Hatton and Williamson (2005b)².

The welfare magnets theory is another significant recent contribution (Borjas, 1999). It suggests that migrations also depend on differences in the welfare transfers granted by the source and the destination country. In other words, all things being equal, migrants tend to cluster in the countries where public assistance is the highest.

Another renewal concerns the relationship between trade and migration, which has been reconsidered. In fact, if two given countries only differ in their technology for at least one commodity, then trade alone cannot equalize factor prices. Consequently, migration is needed. Trade and migration are thus complementary. Although FDI is sometimes considered as an alternative to migration for factor price equalization, it very often cannot alone ensure this equalization (Razin and Sadka, 1997). This reinforces the complementarity between trade and migration.

A final theoretical contribution concerns the specification of migration costs. Traditionally, it is assumed that these costs involve location costs, such as the geographical distance, as well as monetary or specific costs (differences in unemployment rates between the source and the destination country, differences in the costs of living, differences in language, etc.). However, some new costs have recently emerged: the first is border effects, as an additional location cost variable. This concept was first introduced in international trade theory (McCallum, 1995) before being extended to migration theory (Helliwell, 1997; Hunt and Mueller, 2004). It measures the specific cost of crossing a frontier, assuming that, all things being equal, it is easier to migrate within a country (internal migration) than across countries (international migration).

New developments in migration costs also include migration policies³. For example, if the destination country decides to reduce the number of visas available, this will introduce additional costs for migrant candidates, who will have to queue for a longer time to get a visa or to pay more for this visa. Similarly, the home country can directly or indirectly drive a migration policy, by making it easier or harder to leave this country (police controls, deprivation of rights, etc...).

As a final new migration cost, it is worthwhile mentioning the lack of business or human networks. Indeed, it is

generally recognized that leaving one's home country implies leaving one's friends and family (human networks). This introduces psychic costs that can be taken into account in migration models (Lalonde and Topel, 1997). The same remark applies to business ties, which are partially lost when leaving a country.

To sum up, the recent renewal in migration theories has considerably improved our understanding of migration patterns by enlarging the number of explanatory variables and questioning the traditional ones, especially the relationship between trade and migration.

2.2. A description of the determinants of migration from MENA countries to the EU

The recent theoretical developments described above make it possible to derive an empirical model for international migration. The equation proposed here below follows Borjas' spirit while including a larger selection of migration costs. A similar presentation can be found in Clark et al. (2002), Hatton and Williamson (2005b) as well as Péridy (2006)⁴

The emigration rate (M_{hft}) from the home country (h) to the foreign country (f) at year t is measured by the gross flows of emigrants into country f from country h, as a proportion of country h's population. This rate depends on several variables, which are all fully described in the Annex.

$$\begin{aligned}
 M_{hft} = & \alpha_0 + \alpha_1 \frac{Y_{ft}}{Y_{ht}} + \alpha_2 \frac{\sigma Y_{ht}}{\sigma Y_f} \\
 & + \alpha_3 \left[\frac{\sigma Y_{ht}}{\sigma Y_f} \right]^2 + \alpha_4 \frac{T_f}{T_h} \\
 & + \alpha_5 \frac{SKILL_{ht}}{SKILL_{ft}} + \alpha_6 AGE_{ht} \\
 & + \beta_1 D_{hft} + \beta_2 B_{hft} + \beta_3 L_{hft} \\
 & + \beta_4 \frac{H_f}{H_h} + \beta_5 \frac{U_f}{U_h} + \beta_6 N_{hft}^\beta \\
 & + \beta_7 N_{hft}' + \beta_8 P_{ft} + \beta_9 P_{ht} \\
 & + \delta_h + \gamma_f + \lambda_t + \varepsilon_{hft}
 \end{aligned} \tag{1}$$

These variables include the foreign to home country's income ratio (Y_{ft}/Y_{ht}), the income inequality ratio ($\sigma Y_{ht}/\sigma Y_f$), the welfare transfers ratio (T_f/T_h) as well as the skills' ratio ($SKILL_h/SKILL_f$). As expected from the extended Borjas' selection model, α_1 and α_4 are expected to be positive; α_2 and α_3 are expected to be positive and negative respectively in order to reflect the inverse U-shape relationship for income inequality. Finally, a positive α_5 parameter denotes a

² The self-selection model has also been extended to return migration (Borjas and Bratsberg, 1996) or family migration (Borjas and Bronars, 1991). Related models also include people whose migration decision is not primarily determined by economic motivations, such as refugees or religious migrants (Chiswick, 1999). However, all these extensions only slightly modify the selection process without significantly changing Borjas' initial results.

³ In fact, migration policies were initially included in the framework of the political economy of migration. They have only recently been included as migration costs in migration theory (Benhabib, 1996; Bauer et al., 2000; Karemera, 2000).

⁴ In order to save space, we do not present here the formal derivation of the model. It is available upon request.

positive selection process whereas a negative sign denotes negative selection.

The model may also be extended in order to account for the age structure of the population in the source country (AGE_{ht}). Since individuals want to maximize the present value of their net expected income earned in the foreign country, it is easy to show that this value is maximum when the individual is the youngest (Clark and al., 2002). As a result, the emigration rate is positively correlated with the share of young workers in the source country population ($\alpha_6 > 0$).

Migration costs are denoted by the geographical distance between the home and the foreign country (D_{hf}), border effects (B_{hf}), differences in languages (L_{hf}), the cost of living ratio (H_f/H_h), the unemployment rate ratio (U_f/U_h), business and human networks (N^b_{hft} , N^p_{hft}) and migration policies in the home and the foreign country (P_{ht} and P_{ft}).

Specifically, border effects are measured by a dummy variable which is equal to zero for internal migrations and unit for international migrations; differences in language are also proxied by a dummy which is equal to zero for any pair of countries which speak the same language, and unity otherwise; business networks are calculated from the total bilateral trade between countries h and f (imports plus exports); human networks are measured by the lagged stock of migrants. It is expected that the higher the trade flows and the higher the migration stocks, the lower the cost due to the lack of networks (business and human). As a result, β_6 and β_7 are assumed to be positive, whereas β_1 to β_5 are expected to be negative.

Finally, the foreign country's migration policy is measured by the total number of residence permits delivered by country f, as a proportion of the world population ($\beta_8 > 0$). With regards to the home country's migration policy, it is proxied by an index of civil and political deprivation of rights (see the Annex for a complete description of all the variables). β_9 is generally expected to be positive, as the deprivation of rights can encourage people to escape their countries. However, if the home country implements policy controls or retaliation measures, this may eventually discourage people from leaving their country. As a result, β_9 can be negative, as in Péridy (2006).

The final line in equation (1) includes specific effects re-

lated to the home and the destination country, as well as specific time effects. These effects, which account for any omitted variables in the model, may be considered as fixed or random depending on the selected econometric specification.

Table 4 provides interesting insights about the variables described above, which have been calculated for MENA countries. First, there is a large gap between GDP per capita and public spending between the EU and most MENA countries, especially Morocco, Egypt and Syria. All things being equal, this is expected to strongly push up migration from these countries. The age structure of the MENA countries' population, which is much younger than in the EU, is another pushing factor, as well as the relative lack of freedom compared to the EU level.

In terms of migration costs, MENA countries may be divided into two groups: the first corresponds to Maghreb countries, for which migration costs are much lower than the other MENA countries. In particular, the short distance combined with well developed human and business networks with the EU strongly reduce migration costs compared to the other countries. These relative costs are also reduced because of much higher unemployment rates (especially in Algeria and Morocco) as well as limited differences in the cost of living with the EU (except Tunisia). Lebanon is also concerned with lower migration costs, though to a lesser extent because of the greater distance from the EU. However, the other Mashrek countries generally show much higher migration costs, especially Egypt, Jordan and Syria.

To sum up, the high migration rate (with regards to the EU) recorded in section 1 for Morocco, but also Algeria, Tunisia and Lebanon are expected to be explained by the low migration costs combined with their low GDP per capita, their low public spending as well as their young population. Income inequality as well as skills may also play a role. However, given the theoretical non linearity or uncertainty concerning the sign of the corresponding parameters, it is not possible to be more precise without estimating the model. For that purpose, the following section provides additional information, through the parameter estimates for each variable.

3. Migration patterns and prospects concerning the EU and MENA countries: an econometric analysis

Table 4. Main migration determinants calculated for MENA countries

	Algeria	Morocco	Tunisia	Syria	Jordan	Egypt	Israel	Lebanon	All MENA	EU-15
Y_{it} = GDP/capita (1000 \$US)	5178,6	3483	6302,9	3240,5	3943,2	3180,9	18857,0	5110,8	4357,7	22785,5
sY_{it} = Income inequality (Gini coefficient)	35,3	39,5	39,8	35,0	36,4	34,4	35,5	40,0	37,0	31,5
T_{it} = Public spending (as a % of GDP)	8,5	8,0	9,3	6,3	12,4	5,7	13,5	6,2	8,7	12,2
SKILL _{it} = Skill level (%)	67,0	36,0	65,0	43,0	80,0	81,0	89,0	75,0	67,0	91,7
D_{it} = Distance from the EU (kilometers)	1807,8	2255,3	1808,7	3043,5	3202,0	3081,0	3133,7	3030,9	2670,4	-
U_{it} = Unemployment rate (%)	27,3	18,3	14,9	11,7	15,0	10,2	10,3	18,0	15,7	6,7
H/H_{it} = Cost of living ratio	81,9	81,6	65,2	80,0	80,1	72,5	87,6	84,6	76,7	96,5
N^b_{it} = Trade with the EU (1000 \$US)	17229,3	11275,8	11166,4	4714,0	1623,5	7369,7	17472,4	2447,8	9162,4	-
N^p_{it} = Migrant stock in the EU (*1000)	766,5	1634,6	358,0	67,2	20,5	123,2	43,9	109,4	390,4	-
AGE_{it} = % age 15+ (% population)	31,2	31,9	27,5	35,0	35,0	34,3	28,0	29,5	31,6	16,9
P_{it} = Deprivation Freedom index	5,5	5,0	6,5	7,0	5,5	6,0	2,0	6,5	5,5	1,0
M_{it} = Emig. rate toward the EU (%)	2,45	5,24	3,65	0,39	0,39	0,17	0,73	2,96	0,22	-

Source: own calculations. The detailed description of the variables are provided in the Annex

Table 5. Estimation Results

	Description	Variable (1)	HT (MENA) (2)	HT (Enlarged) (3)
GDP per capita	Y_i/Y_{it}	0.0145***	0.0049***	0.0033***
Gini	$? Y_{it}/? Y_i$	1.2759**	0.120**	0.124**
Gini ²	$(? Y_{it}/? Y_i)^2$	-0.510**	-0.071**	-0.057**
public spending	T_i/T_{it}	0.0179***	0.0077***	0.0029***
Distance	D_{it}	-0.00097***	-0.00021***	-0.00022***
Border effects	B_{it}	-	-4.9023***	-4.545***
Differences in language	L_{it}	-0.1987**	-0.4176***	-0.662***
Business ties	N_{it}^{BUS}	0.264D-03***	0.244D-05***	0.174D-05***
Human networks	N_{it}^{HN}	94.896***	105.982***	102.713***
EU countries' migration policy	β_E	4.7120***	3.5219***	2.796***
MENA countries' policy	β_M	-0.0699***	-0.0536***	-0.0523***
Cost of living	H_i/H_{it}	-0.1681*	-0.087*	-0.86***
Unemployment	U_i/U_{it}	-0.1442**	-0.0662**	-0.0676***
Skills	$SKILL_i/SKILL_{it}$	0.8751**	-0.9105***	-1.141***
Age	AGE_{it}	0.1933***	0.1673***	0.1541***
specific migration policy: MENA	MED		+0.0171	-
specific migration policy: Algeria	ALG			0.6813*
specific migration policy: Morocco	MOR			3.8188***
specific migration policy: Tunisia	TUN			1.5244***
specific migration policy: Egypt	EGY			-1.4013***
specific migration policy: Israel	ISR			0.3972*
specific migration policy: Jordan	JOR			0.1237
specific migration policy: Lebanon	LEB			1.0772***
specific migration policy: Syria	SYR			-0.2552*
Constant		-10.005***	-5.9297***	-5.132***
R2 (adjusted)		0.852	0.891	0.901
number of observations		1120	9380	9380
LM test		2572.6***	24069.7***	24339.7***
Wald tests:	MENA countries (?)	346.7***	2376.0***	2376.0***
	EU countries (?)	374.3***	10666.3***	10666.3***
	time (?)	3.7**	18.4***	18.4***
Hausman test		592.75***	665.94***	666.6***
Hausman and Taylor test		0.964	0.989	0.990

***) significant at a 1% level; **) significant at a 5% level; *) significant at a 10% level.

3.1. Explaining migration patterns: the estimation of the model

Equation (1) is estimated first for the eight MENA home countries toward each EU-15 destination country⁵, from 1993 to 2002. This panel data model includes 1120 observations (column 1)⁶.

The choice of the appropriate estimator is guided by specific econometric tests: the LM test, which is significant at the 1% level, leads to the rejection of the OLS estimator. The Wald tests provide significant values for the country-specific effects (δ_{it} and γ_{it}) as well as time effects (λ_t). This gives an advantage to the Within estimator. However, the latter cannot be implemented efficiently here, given that it cannot estimate the parameters related to time-invariant variables, such as distance, border effects, differences in languages, etc. Neither can traditional random effect estimators (GLS or FGLS) be used, since the Hausman test clearly indicates a correlation between the residuals and some independent variables. Consequently, we eventually select the Hausman and Taylor (HT) estimator, as also recommended by several authors in this case (Egger, 2004, Greene, 2003). Its advantage is to make possible the estimation of the parameters corresponding to the time-invariant variables while correcting the bias due to the correlation of the residuals. This estimator has been computed as in

⁵ Belgium and Luxembourg account for one country.

⁶ In this first estimation, the border effects variable cannot be estimated since EU countries are not included as home and foreign countries simultaneously. This restriction will be relaxed later on.

Greene (2003, p. 303).

Column 1 in Table 5 shows the HT parameter estimates as well as the tests described above. The most significant variables (1% level) are the income ratio, public spending, the age structure, and most migration costs, especially the geographic distance, networks (human and business) as well as the destination country's migration policy. All these variables show the expected signs.

Differences in language, in employment rates or in the cost of living also show the expected sign and are significant at a 5% level. In the same way, the income inequality parameters

- α_2 and α_3 - are significant and respectively positive and negative, as theoretically expected. This indicates that when income inequality is low in MENA countries, a rise in this income inequality first pushes migration up. However, beyond a certain point, as income inequality becomes greater in MENA countries than in the EU, an additional increase in income inequality reduces migration.

The education level of the population is also significant. Its positive sign indicates that emigration into the EU from MENA countries increases with the migrants' education level. This may be explained by the fact that the EU provides a higher return to skills than MENA countries. In other words, the skilled workers' income is higher in the EU compared to MENA countries, relative to the unskilled workers' income. This also suggests a positive selection process between the EU and MENA countries.

Finally, the parameter corresponding to MENA countries' policy (β_9) is significant, but shows a negative sign. This means that as the deprivation of civil and political rights becomes greater, it becomes more difficult for people to leave their home country. In this regard, the position of Syria (which has the greatest deprivation of rights) may be compared to that in Israel and Morocco (with lower deprivation).

To sum up, the empirical model confirms that the high migration levels from MENA countries toward the EU are primarily explained by differences in living standards and welfare spending. Other crucial determinants are the age structure of the population as well as the reduced migration costs in terms of distance, networks or EU migration poli-

cies. Estimations also highlight the role of education and income inequality for explaining migration.

Additional information can be provided through the estimation of the model by enlarging the selection of home countries to non-MENA countries. This first makes it possible to analyze the general migration determinants into the EU and thus to compare this general pattern with the specific MENA-EU determinants. Secondly, the impact of the EU countries' migration policy can be further investigated.

For this purpose, the home country sample is extended to 67 countries⁷. This increases the number of observations to 9,380. Column 2 in Table 5 considers the corresponding parameter estimates. Several features emerge from this column. The first is that the parameter estimates are generally similar to those calculated in column (1) in terms of sign and magnitude. As a second feature, the education variable is a notable exception: it shows a negative sign in the enlarged country sample, whereas this sign is positive in column (1). This suggests that the EU generally experiences a negative selection process with its partners, with the exception of MENA countries. This may be explained by the fact that MENA countries are generally more equal than the other developing countries' partners, and sometimes more equal than EU countries in terms of income⁸. As a result, highly skilled people from MENA countries enjoy a limited return to skills at home compared to other developing countries or some EU countries. This incites them to migrate towards the EU, as their skill level increases.

A third feature of column 2 concerns the border effect parameter, which is negative and significant at the 1% level. This indicates that crossing a frontier is an important migration cost, as expected theoretically. This result also correlates some new empirical results found in Hunt and Mueller (2004) as well as Péridy (2006).

A last feature is provided by the specific policy dummy (MED), which accounts for the specific impact of the EU migration policy for MENA countries. To understand this, we must remember that the policy variable P_{ft} is measured by the total number of residence permits delivered by each EU country. Therefore, this variable measures the general impact of the EU countries' migration policy, whatever the source country considered. This is why adding a specific dummy for MENA countries complements this result by showing how much the EU policy

with regard to these countries in particular is tough or not compared to the non-MENA countries' partners. Since the corresponding parameter estimate is not significant, this means that overall, the EU migration policy concerning MENA countries has no specific impact (is neutral) compared to the other countries.

However, introducing specific dummies for each MENA country taken separately gives a more precise picture (column 3): in fact, some countries seem to have enjoyed a rather favorable migration policy, namely Maghreb countries and Lebanon. This may be at least partly explained by the massive regularization programs, which increased migration flows into Southern European countries. On the other hand, some Mashrek countries have faced a more detrimental migration policy from the EU, as the specific dummies are negative, especially Egypt and Syria. However, the interpretation of these results must be made cautiously given that they rely on a dummy coefficient only.

3.2. Migration prospects from MENA countries to the EU: A calculation of migration potentials

The previous results can be complemented by the calculation of the migration potential between the EU and each MENA country. For that purpose, we compare the observed emigration rate to the predicted (fitted) one. The latter is obtained through an out-sample estimation of the model. This technique is commonly used in international trade or mi-

Table 6. An estimation of migration potentials between MENA countries and the EU (actual/fitted migration ratio, %)

	Israel	Algeria	Morocco	Tunisia	Egypt	Jordan	Lebanon	Syria	All
France	117,1	121,8	118,4	124,4	101,0	107,8	128,1	100,7	110,3
Belgium	85,5	99,9	125,1	106,8	85,3	90,8	104,7	73,2	95,4
Germany	109,1	113,0	116,8	121,2	102,8	107,5	119,7	100,4	108,5
Italy	101,5	116,8	131,2	129,8	119,8	100,0	100,2	83,4	116,7
Netherlands	85,4	98,1	118,9	102,4	85,3	90,2	90,1	72,4	93,4
UK	102,6	105,6	103,4	113,3	95,9	106,8	107,1	88,9	100,0
Ireland	87,4	83,3	80,0	90,9	67,7	91,9	91,7	74,1	76,4
Denmark	85,0	89,0	98,6	97,2	78,7	89,9	112,0	71,1	85,5
Finland	85,6	80,6	79,5	88,2	66,2	90,5	91,0	72,4	74,8
Sweden	85,4	90,0	89,4	98,3	79,4	90,4	118,1	72,4	84,7
Austria	83,8	98,9	97,6	106,5	83,6	88,7	88,8	70,1	89,0
Spain	98,4	114,2	134,0	122,2	84,1	103,0	103,4	86,7	102,0
Greece	82,6	83,1	81,4	89,5	109,4	87,7	123,5	107,9	97,4
Tot. EU	100,7	102,0	112,5	113,6	97,1	103,2	112,7	91,0	101,6

⁷ These are the 8 MENA countries, 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, Russia, Belarus, Ukraine and Moldavia.

⁸ Specifically, income inequality is particularly low for Algeria and Mashrek countries (the Gini coefficient is about 35). As a comparison, this coefficient is greater for the UK, Ireland and Southern European countries. It is even much greater in most developing countries, especially Latin America and Gulf countries (>50) as well as Asian countries (>40).

⁹ Portugal is excluded from the country sample because of the lack of reliable data.

gration models (Péridy, 2005, Alvarez et al., 2003).

Table 6 shows the actual/fitted emigration ratio (in %), which is used as a measure for the migration potential between each source and destination country: when it is below 100%, this means that the actual emigration rate is below the fitted one. As a result, there is a potential for additional migration flows between the source and destination countries considered.

Taking together all MENA countries and all EU-15 countries⁹, the actual/fitted emigration ratio is close to 100%. This means that migrations from MENA countries to the EU are overall at “normal” levels compared to migrations from the other countries to the EU, once taken into account all migration determinants (distance, income, etc...).

However, there are significant differences between countries: in this regard, three types of migration flows can be identified. First, it is striking to observe that actual migrations from Maghreb countries and Lebanon toward Southern European countries are much above the fitted ones. This result correlates with the one found previously, when highlighting the positive dummy coefficients for these countries. As already said, this result may be due to accommodating policies in Spain, Italy and France regarding migration from these countries, especially at the time of the regularization programs. Germany and the UK also show actual/fitted migration ratios above 100% with regard to Maghreb countries, though to a lesser extent.

A second type of flow concerns migration from Mashrek countries (except Lebanon) to Southern European countries (including France) as well as Germany and the UK. For these flows, the actual/fitted migration rates are generally slightly above 100%.

Conversely, whatever the originating country, Northern European countries show an actual/fitted migration ratio which is well below 100%. This concerns especially Finland, Sweden, Denmark and Ireland. Although these countries have generally implemented favorable migration policies, they have not been concerned by a high number of migrants from MENA countries. As a result, there has been no need for regularization programs in these countries.

In conclusion, the results found in this paper point out the striking geographic disequilibrium in migration flows from MENA countries into the EU. Indeed, once all migration determinants have been taken into account, actual migration flows are much above their fitted values in Southern European countries, whereas they are well below in Northern European countries. Moreover, these flows are above their fitted values for Maghreb countries and Lebanon, whereas they are below for the other MENA countries. These results also underline the role of migration policies regulating migration flows. Indeed, the predominance of national policies is partly responsible for this geographic disequilibrium in migration flows into the EU. This problem could at least be addressed with a single EU migration policy. Moreover, the recent implementation of restrictive policies with regard to illegal migrants and unskilled mi-

grants might have a significant impact on migration flows from Maghreb countries into the EU, by reducing the gap between actual and “normal” flows.

Annex: Definition, measurement and sources of the variables used in the empirical model

- M_{hff} = emigration rate from country h to country f. It is measured by the gross flow of migrants into country f from country h as a proportion of country h's population. Source: OECD (2005), complemented by national sources.
- Y_{ff}/Y_{hf} = GDP per capita ratio in \$US, PPA adjusted. Source: CEPII (2005)
- $\sigma Y_h/\sigma Y_f$ = income inequality ratio, measured by the Gini coefficients of households income or consumption. Source: United Nations (2005).
- T_f/T_h = welfare transfers ratio, measured by public education and health spending, as a proportion of GDP. Source: World Health Organization (2005) and UNESCO (2005).
- $SKILL_h/SKILL_f$ = net secondary enrollment ratio. Source: UNESCO (2005).
- AGE_{hf} = share of people younger than age 15 in country h. Source: United Nations (2004).
- D_{hf} = weighted geographic distance between country h and country f (in kilometers). It is measured by the inter-city weighted distance index developed by CEPII (2004):

$$D_{hf} = \left[\sum_{k \in h} \frac{POP_k}{POP_h} \sum_{k' \in f} \frac{POP_{k'}}{POP_f} d_{kk'}^\theta \right]^{\frac{1}{\theta}}$$

where POP_k and $POP_{k'}$ denote the population in the various cities k in country h and k' in country f θ measures the sensitivity of migration flows to the standard bilateral distance $d_{kk'}$. For simplicity and as in trade models, θ is chosen to equal unity.

This index is more precise than the standard (unweighted) geographical distance usually used in the literature, because it accounts for the spatial distribution of the population within each country.

- B_{hf} = border effects between country h and f. It is measured by a dummy: $B_{hf} = 0$ for internal migrations ($f=h$) and $B_{hf} = 1$ for international migrations ($f \neq h$). Data for internal migrations stems from Eurostat (2005) and OECD (2000).
- L_{hf} = dummy which accounts for differences in languages: $L_{hf} = 0$ if countries h and f speak the same language and 1 otherwise.
- H_f/H_h = cost of living in the foreign country as a proportion of that in the source country. It takes into account housing prices, urban transport, food, clothing and entertainment in the biggest cities in each country. Source: Mercer (2005).
- U_f/U_h = unemployment rate ratio. Source: International

Labor Organization (2005).

- N_{hft}^b = business ties measured by the sum of bilateral imports and exports between any pair of countries. Source: Source OECD (2005).
- N_{hft}^p = private networks, proxies by the lagged migration stock into country f from country h (Source: OECD, (2005).
- P_{ht} = home country's migration policy. It is measured by an unweighted average of the index of civil and political deprivation of rights. This index varies between 1 (maximum freedom) and 7 (minimum freedom). Source: Freedom House (2005).
- P_{ft} = destination country's migration policy, measured by the total number of visas delivered by each country f, as a percentage of the world population. Source: OECD (2005) complemented by national sources.

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