Determinants of Bilateral Immigration Flows Between The European Union and some Mediterranean Partner Countries: Algeria, Egypt, Morocco, Tunisia and Turkey

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DETERMINANTS OF BILATERAL IMMIGRATION FLOWS BETWEEN THE EUROPEAN UNION AND SOME MEDITERRANEAN PARTNER COUNTRIES: ALGERIA, EGYPT, MOROCCO, TUNISIA AND TURKEY

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In this paper one survey of econometrics modelling about migration flows determinants is carried out, with an extensive critical review of variables and methods used in recent literature. After it, a rigorous model to forecast migrations flows from Morocco, Algeria, Tunisia, Egypt and Turkey to EU is developed. The weight of network effects and potential migration in origin countries is pointed out and 15 years of forecast horizon is drawn.

JEL:

Keywords: migration determinants; migration econometric models; migration flows; EU-MPC migration

Introduction

The purposes of this research can be summarized as follows:

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1. To provide a quantitative measure of migration potential of European (receiving) and Mediterranean Partners (MPs, sending) countries given the current trends of demographical changes in both areas.
2. To anticipate the most reliable future demography – migration scenarios that will arise in a long term perspective
3. To present a rich quantitative described migration map between EU and MPs areas, identifying the past, current and future trends.
4. To measure the relative weight of the main macro - economic and social – structure variables in the current evolution of the migratory flows between EU and Mps countries.
5. To anticipate a detailed baseline scenario of migration flows coming from MPs in relation with a consistent scenario of socio - economic evolution in this two countries for the next 25 – 30 years.
6. To provide political decision oriented advices about the effects of priority socio economic reforms in MPs on migratory potential and expected real migratory flows in the long term.

All these elements together will provide, in our opinion, a complete analytical basis:

1. for the understanding of real and potential migration movements from the Maghreb to the EU,
2. for the formulation of economic and social policies which directly or indirectly affect the migration phenomenon and,
3. for the formulation of co-operation policies and international relations programmes in a broad socio – economic base

For achieving these ambitious goals, we propose to use a rich methodology approach that combines:

1. a country specific demographic base calculation of migration potential and propensity in each country and,
2. an econometric Dynamic Panel Data model for the analysis of vis-a-vis migratory flows in a mixed short – term & long – term basis

As pointed out in the introductory section of this study, the recent enlargement process of EU has increased the population by almost 20% (nearly 453 million inhabitants). Even if the population of the new Member States is somewhat younger than that of the EU-15 countries, the trend towards ageing of the European population, that stems from decreasing fertility levels and increasing life expectancy, is still present in the EU-25.

On the other side, demographic trends in MPs countries point out that the share of the young people would be very high (30-40% of the population) and the labour force growth rate would still be at 3-5% in the following years; in spite of kind of demographic transition evidences, demographic pressure in MPs is not likely to ease for some time in general terms so the age structure is such that the tension will ease only in the long term, and increase in the short and medium term.

As a result of this global demographic scenario, international migration flows are the main source of population growth in Europe (nearly 80% of 2006 population growth were estimated to be immigrants) and the only influence for demographic changes on the European aging process and low birth rates trend. First and foremost, internal migration flows of immigrants, going from new member states to former UE-15 countries, seems to be a significant driving force of population dynamics but, in addition, and in particular in the recent years, the flow of migrants coming from North Africa has also notably increased (the EU is the destination of current choice for 78% of East Europeans, 79% of Middle Eastern migrants and 93% of those from North Africa).

From a labour market perspective, immigration is valued as an eventual essential production factor to ensure a firm and sustained economic activity in European countries; migration is undoubtedly a potential benefit for the stressed European labour market as it was reckoned in the "Green paper on an EU approach to managing economic migration"; "(…..) *given the impact of demographic decline and ageing on the economy, an economic migration strategy could have a positive impact on competitiveness and, therefore, on the fulfillment of the Lisbon objectives*". It is thought that, in general, migrant workers can help to fulfill shortages of less qualified labour market segments, reducing wages pressure, inflation and therefore, boosting economic

growth; in addition, indirect contributions must be considered (increase of EU labour market mobility, for example).

At the same time, and for sending countries, migration seems a "escape valve", or at least an equilibrium energy, for weakly developed labour markets in the short term so the authorities in these countries consider the outflow of their workers as "necessary" and "profitable" for reducing the unemployment pressure, training future returned migrants and also procuring remittances in order to finance development.

On the negative side, labour (economic) immigration is also commonly perceived as a potential medium or long term threat in European Countries. Most developed receiving countries across Europe are facing migration pressures drawing up plans to match supply and demand for labour markets avoiding potential distortion of "native" salaries and level of employment. This cautious attitude is not only clearly revealed for third (non EU25) countries: following EU enlargement, national measures restricting free movement of labour were introduced by 12 of the former EU-15 Member States on the eight new eastern and central European Member States. The labour market equilibrium could be preserved in the short or medium term, but can eventually turns into an unbalance if a solid and sound economic growth could not be retained.

For MPs countries, and in the long term, the increase of potential migration is also a worrying structural issue First of all, growing migration flows reveals an increasing North – South gap arriving from an unbalanced or insufficient socio economic development (leaving apart that an increase in migration can also be a short term negative externality of necessary socio economic structural adjustments). In second place, labour force outflows hinders or reduces the chance of long term economic revitalization even if structural economic and labour markets reforms are planned.

In summary, migration flows from MPs to EU, emerge as a critical variable for policy decision making process in a global socio economic framework. It seems clear that migration pressure and potential, and the integration of immigrant population in the long term planning becomes a priority in a broader economical and political perspective within the framework of Euro-Mediterranean Partnership.

In this context, it seems necessary to analyze the relevance of the different determinants of potential migration ("pull" EU and "push" MPs factors) in a short term and long term dynamic perspective. The identification and measurement of the relative influence of different factors that impact migration flows could help:

1. To anticipate the future of the migration scenario given the ongoing demographic trends and the economic and social evolution projections for EU and MPs in the absence of structural reforms in those countries

2. To evaluate the impact on this baseline migration scenario of the different development policy strategies that could be adopted either in the national level or in the framework of EU & MPs cooperation programs.

3. To obtain a relative measure of the contribution of short – term variables (adjustments) in the prospects of potential and flows of migration on both sides, and to distinguish them from long term changes and structural reforms.

Given this global research framework, the research project presented in this paper will be handled in the following phases:

1. In a first stage, we will carry out an analysis of migration potential for the main MPs countries (including Turkey) and the EU25 members. For this section, we will try to measure the potential supply and demand labour force according just to demographic structure and evolution at national level in a theoretical basis of a closed and opened economy approach.

2. In a second stage, we will move to real data on migration flows in order to measure in detail and compare over time and cross country, the map of European labour migration.

3. In a third stage, we will use a model to try to understand these real migration flows between every country with the aim to reveal the contribution of a set of "push" and "pull" factors (including potential migration measured in stage 1) into the extent and speed of migration flows. This analysis, will also try to

measure the influence of scale effects (distance, cultural or language affinity) and migration barriers in the composition of migration flow structure between every pair of countries.

4. In a forth stage, we will use the results of the model in phase 3 to clearly describe the most plausible scenario that we could expect given a consensus forecast framework for the main demographic, economic and social variables connected with migration dynamics.

5. In this last stage, we will evaluate the impact of changes in the forecast baseline scenario of migration coming from Turkey, Egypt, Tunisia, Algeria and Morocco to EU if socio – economic reforms in those countries produce significant changes in the critical "push" and "pull" factors of migration.

Modelling mathematically immigration determinants

When explaining the reasons to emigrate, and the choosing of destination, economic literature tends to centre basically on three kinds of theories (Hooghe et Al., 2008):

- For economic and labour-based theories, the key factor in deciding to emigrate is the relative differential living Standard between destination and origin (whatever it is measured by relative GDP per capita, wages, or possibilities of finding a better paid job).

- In the framework of cultural and hegemonic theories, and incentive to population flows are assumed from the periphery to the core on the basis of linguistic and cultural hegemony, among other related factors.

- In the social theories domain, the key issue is the so-called network effect, based upon the attractive factor to migrants that represent being called from individuals from a family or cultural entourage, which advise them on how to find employment in the receiving country.

It is common practice to differentiate between two kinds of migration determinants: those related to socio-economic characteristics of receiving countries that incentivate migration towards them (pull effects); and those related with the origin country context, which make its citizen to look for a better future outside its origin country (factors that are mainly linked to demographic trends and denominated push effects).

From the already classic models on the causes of international migration (Borjas, 1987 and 1989; Hatton, 1995), to more recent models by Hatton y Wiliamson (2004) or Mayda (2005), it is common practice to recur to the Roy model in order to mathematically specify its main micro-economic and non-economic determinants. Mathematically, the main factors that determine an individual decision to migrate can be formulated as follows:

$$d_i = W_{di} - W_{oi} - z_i - c$$

Where the decision to migrate of individual "i" (d_i) is conditioned by the difference between the wage he receives in the destination country (W_{di}) and the origin country (W_{oi}), sustracting the cost of migrating (c) and the personal loses of the migrant (z_i).

To this equation some determinants linked with the level of wage received as a function of qualification can be added. More specifically, the origin and destination wage perceived will depend upon the qualification of an employee. So, to the previous specification we can add such a precision on the salary in the following way:

$$W_{di} = \alpha_d + \beta_d * S_i$$
$$W_{oi} = \alpha_o + \beta_o * S_i$$

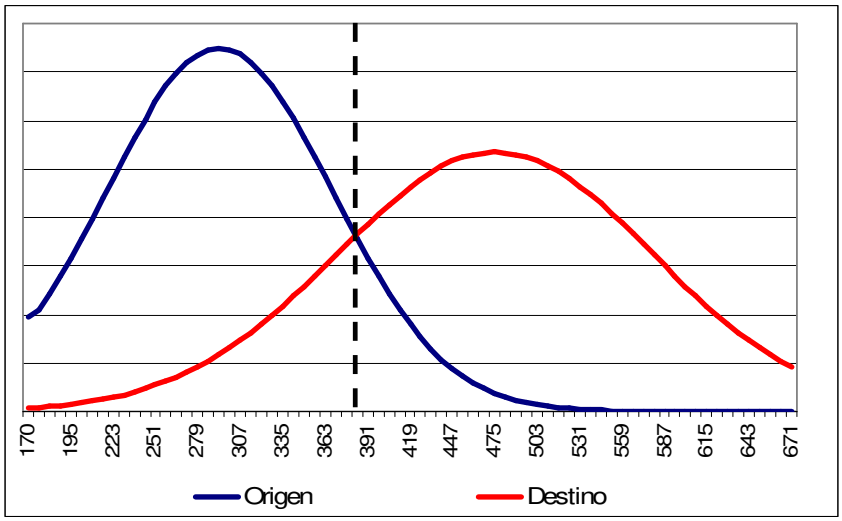
Where wages for each country (origin and destination) have to be modified by an initial value (*alphas*), and by a coefficient representing the qualification skill of the worker (S_i). Incorporating such discrimination by qualification level to the previous formulation, the decision to migrate of individual "I" will be motivated by:

$$d_i = \alpha_d - \alpha_o + (\beta_d - \beta_o)S_i - z_i - c$$

Following this mathematical postulate, it could be said that there will be a positive migration flow towards the destination country insofar the wage-qualification slope is bigger in the origin country (positive selection model) and to the point on which qualification earnings are equalize among both countries.

However, the former assertion should be nuanced or considered by the fact that migrants not only look at wage differentials, but also to the possibility of obtaining a job in the destination country once the decision to migrate has been taken. In short, to the previous formulation another variable that represents the possibilities of finding a job in the receiving country should be added. This variable could approximately be the employment growth rate related to its domestic unemployment rate.

Assuming a normal distribution of wages in both countries (origin and destination), the probability of finding a job with a pre-determined salary could be represented by the following graph:



In this context, there will be incentives to migrate depending on the saturation level of the labour markets. Until both situations cross each other, and meanwhile in the destination country there is a non covered labour demand, there Hill be a clear incentive to migrate: the probability of being better paid in the destination country is much higher than in the origin one.

Borjas (1989) shows that the immigration rate from the origin country to the destination one can be expressed as follows:

$$D = 1 - \Phi \frac{-\mu_{wf} + \mu_{wd} + \mu_z + c}{\sigma_d}$$

In this normal function, "mu" represents the averages for each of the previous variables, and "sigma" represents the standard deviation of the individual decision to migrate. It can be shown from the previous formulation that there is a positive effect to migrate when the wages standard deviation at the origin country is lower than in the destination country (that is, when the level of wage inequality is higher, as represented in the figure above).

Taking into account the variables contained in the term (z), the so-called personal determinants, the academic literature emphasises the importance of elements as the presence of family networks (both in the origin and destination country), historical circumstances (like being a former colony of the destination country), having a common language, etc…

Concerning immigration costs (c), it is central to consider that variable as the minimum threshold in order to determine if it would be or not migration flow, irrespective of how the costs are to be calculated. These costs depend upon the existence or not of a land border, physical distance between origin and destination countries, access to credit for migratory purposes, immigration policies in destination countries-visas, quotas, previous employment pre-requisites, etc… Contrary to what could be expected, the poorest countries are those that generate less migration flows. This is so because, in many cases, the migration cost itself is unaffordable to its income level, a situation that is called "poverty restriction" by the academic literature.

In the Roy model commented above, the so-called push and pull migration effects have been introduced: the circumstances of the destination country that make it attractive to migrants and, in a less clear manner, the determinants of the origin country that makes

its population to migrate away. Concerning the latter dimension, the push effect, the literature has developed a wide number of studies focused on demographic analysis and its relation with occupation in order to determine what it is usually known as "migratory pressure".

There is some controversy over the relative importance of push demographic effects within the migration literature. For authors like Wickramasekara (2001) or Bóhning (1991), these effects would be the more relevant ones when determining international migration flows. For them, migrations are caused by the unfavourable context of origin countries, irrespective of the destination countries socio-economic situation.

On the opposite side, more recent empirical studies find that the significance of the push effects is not the key point. However, it seems sensible to take them into account in a fair measure. To this end, it is advisable to briefly develop a methodology that allows for the determination of the economic-demographic push effect.

In this context, measuring migratory pressure can be attained from two completely different approaches:

- a micro-economic approach, considering the analysis of personal determinants that plot the individual utility function when choosing to migrate or not to do it,
- and a macroeconomic one, emphasising the gap between the demographic and economic variables (the domestic labour market capacity to absorb the new working force)

Following the second approach different OECD studies (Bruni y Venturini, 1995); Giubilaro, 1997), the number of immigrants can be divided across three categories:

- Those that are currently working at their origin country but abandon their jobs to emigrate,
- Those that do not work, but that would like to emigrate and to have the required resources to do so,
- Those currently based in a foreign country in irregular situation,

In order to obtain the number of people in each situation for each origin country, the following starting mathematical identities are proposed:

- The new demand in the origin country labour market is determined basically by new employment demand (linked to the country economic growth), and the replacement of the employees having retirement.

- The new labour supply in the origin country is determined by the population entering the legally fixed working age (over 16 years), multiplied by its corresponding activity rate (the ratio of those entering the labour market, either as occupied or not, but looking for employment). To this population immigrants in the origin country should be added, if any.

- The figure of potentially migrating population can be obtained as the difference between the former two magnitudes, that is, the population that do not find a job in its origin country. To be sure, not all of this population is willing to migrate. The ratio between those that actually migrate and the previous magnitude is the country's migration propensity. In short, this is what could be named the relative push effect.

$$S_{employment} = D_{employment} + Unemployees + Emmigrants$$

$$S_{employment} = New\_employment\_force * Activity\_Rate$$

$$D_{employment} = D_{replacement} + D_{new} + D_{temporal\ \text{withdrawal}} - D_{reincorporation}$$

$$Migrant\ P\text{ropensity}_{\ t} = \frac{Emigrants_t}{(S_{employment} - D_{employment})_t}$$

$$Emigrants_{t+h} = Migrant\_\text{Pr}opensity_t \left[(S_{employment} - D_{employment})_{t+h}\right]$$

Estimating migration propensity can be very complex, because the real decision to leave the country may not be exactly temporally linked to the moment when the origin country surplus in the labour supply is taking place. In this context, it seems important to link this labour surplus in the origin country with the labour deficit in the destination country. That is, estimating the pull effect in the European labour market arising from a non covered labour demand.

About this question, it is important also to consider the kind of labour demand that takes place in the destination country labour market. For instance, in the recent past, those countries with a labour intensive growth model (mainly housing and services) are the ones that register higher immigration flows.

In the following sections a quantitative analysis of the issues detailed above is conducted, in order to determine international migratory flows. It is important to highlight from the beginning that even if the best available statistic information is used, it is sometimes not fully reliable.

PREVIOUS EXPERIENCES IN MODELLING IMMIGRATION FLOW DETERMINANTS

a. Previous econometric experiences in the macro modelling of international migratory flows

Notwithstanding the existence of different sociological, economic and geographic theoretical frameworks that try to explain the migratory phenomenon, those seem to be far too complex to be encapsulated in a single theoretical framework able to deliver the structure of an empirical model. Moreover, even taking into account a framework linked to the different theoretical paradigms (renouncing to verify specific theories), empirical migratory models seem to be operative ex-post. They are useful for the purpose of a posteriori explanations of migratory flow trends, but they do not perform well as a prognosis tool (Öberg and Wils, 1992).

In spite of this negative evaluation, of a generic nature, an impressive number of empirical migratory models can be found[2]. Among them, there are a good number of projective exercises of very different nature: macro and micro approaches, deterministic one (based upon the judgements of experts, based upon migratory polls in origin countries, supported by deterministic projections of demographic cohorts), as well as essentially stochastic approaches (Markov chaines[3], time–event models, etc…).

Concerning the aim of our study, the most interesting experiences are those related with the econometric domain, which centres on international migrations, mainly referring to population flows coming from developing countries[4], with a macro perspective[5] and supported by secondary data (results that do not derive from polling). Within this kind of models we have revised almost 20 studies[6] that have guided our model specification and whose basic features are summarized in the following table:

[2] The empirical literature on international migration is revised generically, for instance, in Borjas (1989, 1994, 1999a, 1999b), Ghatak et al. (1996), and Mitchell and Pain (2002).
[3] A good typology and review of these models can be found in Bijak (2006).
[4] We exclude examples that refer to other kind of migrants (asylum seekers or highly qualified professionals, for instance).
[5] The análisis based upon micro-data can consider variables that are not significant in aggregated macro terms, or that simple cannot be measured at a macro level: on the one side, individual characteristics like education level, family composition, previous migrants in the family, social context; and on the other side, local geographic characteristics. A synthesis of results for 15 micro studies can be found in Bauer and Zimmermann (1999).
[6] Complete reviews of other experiences of an essentially econometric nature can be found in Bauer and Zimermann (1999), Alvarez-Plata et al. (2003), CPB (2004), and Brücker and Siliverstovs (2005). The posibilites offered by ARIMA time series models are reviewed by Alho y Spencer (2005).

Review of previous experiences in modelling immigration flows

Author/authors	General analytic context	Type of Model	Endogenous (explained) variable	Variables/Exogenous structure (Explicative)
Alho (1998)	Finland population forecast.	ARIMA Model	Logarithm of immigration and immigration in volume	- ARIMA (0,1,1)
Álvarez – Plata et al. (2003)	Immigrants coming from 10 Eastern European countries to each EU-15 country. It also analyzes the influence of using different estimators for the panel data model.	Panel data model approached with different estimations.	Percentage of immigrants from each origin country over the destination country population. Two set of data: (1) 33 years of migration from 19 origins to Germany; and (2) cross migration among 250 countries over 8 years.	- Real relative income origin/destination (logarithms) - Real absolute income in the origin country (logarithms) - Unemployment rate at origin country (logarithms). - Unemployment rate at destination country (logarithms). - Total origin country population (logarithms). - Specific dummy variables that reflect some geographic and/or cultural affinities between some origin/destination couples.
Bauer and Zimmermann (1999)	Migration to EU countries from Greece, Spain and Portugal, 1985-1997. Additionally, analysis of those migrations impact over EU labour market.	Semi-logarithmic panel data model with fixed effects. Three alternative sample selections referring to three different moments in migratory-labour policy in the EU.	Number of annual immigrants from each origin as a percentage of origin population from the previous year with annual data 1985-1997 (323 individual data).	- Relative unemployment rates - Real relative GDP per capita (origin/destination)
Boeri, T. and Brücker, H. (2001).	Immigration from Central and Eastern Europe (18 countries) towards Germany in the 1967-1998 period, in the context of Western-Eastern European integration.	Linear regression (with exogenous by levels and differences, similar to an Error Correction Model)	Change in the immigrant stock over origin population ratio.	- Per capita income origin/destination (in levels and differences and always in logarithms) - Origin employment rates (in levels and differences and always in logarithms) - Destination employment rates (in levels and differences and always in logarithms) - Institutional restrictions to migration - Immigrant stock over origin population in the previous period ratio

Author/authors	General analytic context	Type of Model	Endogenous (explained) variable	Variables/Exogenous structure (Explicative)
				- Dummy variables representing migratory agreements - Dummy variables representing free movement of workers - Dummy country specific variable
Borjas (1987)	Analysis of the origin composition of emigration towards the USA in the 1951-1980 period.	Cross-section regression (over cross section)	Average migration rates by origin country 1951-1980.	- Per capita income in origin country - Origin country inequality
Brucker and Siliverstovs (2005)	Immigration in Germany from 18 countries. Análisis of different estimation methods.	Panel data model with simple partial adjustment, estimated with 20 alternative estimators with annual immigration data coming from 18 origins between 1967 and 2001.	Percentage of immigrants over origin population.	- Logarithm of the origin/destination wage ratio measured in current exchange rates - Logarithm of origin wage - Logarithm of origin employment rate - Logarithm of destination employment rate - Lag value of the endogenous variable (% of immigrants over origin) - Dummy variables on the existence of bilateral migratory agreements - Dummy variables on the existence of free movement agreements - Logarithm of each origin country-Germany distance - Dummy for geographical proximity - Dummy for common language
Clark et al. (2002)	Analysis of total emigration and its origin composition from 81 different countries towards the USA in the 1971-1998 period	Ordinary Least Squares regression combined over complete panel of 2268 observations by country/year.	Logarithm of the ratio of immigrants admitted by country for each thousand inhabitants in the origin country.	- GDP per capita (PPP) 1985 ratio origin country / USA - Years of studies of over 15 years population ratio origin country/USA - Percentage of population between 15 and 29 years in the origin country - Family income Gini coefficient ratio of origin country/USA - Distance from Chicago - Dummy of common language at origin country (English) - Dummy for landlocked countries - Origin country immigrant stock per thousand inhabitants - Gini coefficient of origin country divided by square of origin country per capita income

Author/authors	General analytic context	Type of Model	Endogenous (explained) variable	Variables/Exogenous structure (Explicative)
				- Additional Dummy variables intended to capture USA migratory policy changes during the period.
De Beer (1997)	Immigration forecasting in the Netherlands	ARIMA Model	Volume of emigrants and immigrants and, alternatively, net migration	- AR(1) for emigration and immigration volumes - MA(1) for the net migration volume
Fertig (2001)	Migration to Germany (and the UK n a 2003 revision) from 18 European countries.	(1) GMM Estimation of endogenous with simple ortogonal error components country/period (AR(1) specification) in time resid and (2) same model adding some exogenous (relative yield and population)	Net immigration flow to Germany (and the UK) from each origin as % of origin population.	- Relative income per capita (PPP) - Percentage of population between 20-39 years in origin countries - Cross-section resides by each country (no time variant). - Time annual resid (no country variant) with autorregresive structure (AR(1)). - Additionally, other structures allowing for specific fixed effects by country were tested for some destinations.
Gorbey et al. (1999).	Migration between Australia and New Zealand	VAR model over quarterly data	The VAR structure do not distinguish between endogenous and exogenous	- Ratio of net migration - Annual differences of net immigration ratio - Real GDP growth for both countries - Real GDPper capita growth for both countries - Differences in country unemployment rates - Unemployment growth indexes for Australia and New Zealand - Growth in the ratio of wages between both countries
Hatton and Williamson (2002)	World immigration 1970 – 1975 and 1995 – 2000 between 80 countries grouped in 10 geographical zones.	Combined OLS Regression for 480 observations (country/period).	Net immigration per thouisand inhabitants and year (five year averages)	- Percentage of 15-29 years population, 5-years average - Percentage of foreign born in the country at the beguinning of the period - Percentage of civil war years over the period - GDP per capita (PPP) ratio over the weighted average of the sample less the average ratio years of study for population over 15 years to the average of years of study for the whole countries - Ratio relative regional GDP (same as befote but computed for each region

Author/authors	General analytic context	Type of Model	Endogenous (explained) variable	Variables/Exogenous structure (Explicative)
				separately) - Average ratio of the Gini coefficient over the square of per capita income
Jennissen (2004).	Several separated models (for regions and even country specific) in the general context of European migration. Finally a single aggregated model for Wetern Europe of special interest.	For the migration combined model in Wetern europe: OLS regresión combined with heteroskedasticity component and, alternative, SUR estimator	Net migration (computed as total population growth les natural population gorwth over total population) with 1960 and 1998 data for 13 countries (in the Wetern European aggregated model).	- GDP per – cápita - Unemployment as percentage of active population (in the origin, destination or both countries according to the chosen model) - Average education years for population over 25 years (at the origin, destination or both countries according to the chosen model) - Per capita immigrant stock (totals foreigners at the beginning of the year) - A high number of dummy, country or period specific variables, intended to capture relevant changes in entry regimes, bilateral conflicts, socio-political instability periods, etc… - In some specification it add an AR (1) structure
Kamemera et al. (2000)	Analysis of emigration to the USA in the 1976-1986 period.	Gravity model with panel data regression 1976 - 1986	Average emigration rates by origin country to the USA 1980-1986.	- Distance - Relative income origin / destination - Unemployment in the US - Political rights and individual freedom indicators - Political instability
Keilman et al. (2001)	Norway population forecast	ARIMA Model	Logarithm of immigration and logarithm of emigration.	- ARMA (1,1) for the immigration logarithm - ARIMA(0,1,0) for the emigration logarithm
Mitchell,J. y N. Pain (2003)	Determinants of UK entry migratory flows	Different alternative models tested: ARDL (autorregresive lagged errors) with Mean Group Estimators and Pooled Mean Group Estimator, Dynamic Panel Data with fixed Effects	UK annual immigration rate (immigrants from each area over origin population) for 10 geographical areas between 1980 and 2000. Gross immigrants entries.	- Real per capita income level UK/origin area (in logarithms) - Growth of real per capita yield UK / origin country (for short term) - UK Employment - UK relative per capita Yield/ alternative destinations - Share of population between 15 and 29 in origin countries - Trade volume between UK and each origin country, measured as percentage of GDP for the area - Lagged Migrants Stock
Orłowski (2000)	Immigration from Central and	Linear regression	Percentage of immigrants from	- Destination country population size

Author/authors	General analytic context	Type of Model	Endogenous (explained) variable	Variables/Exogenous structure (Explicative)
	Eastern Europe to the EU after enlargement.		each country over each destination country population.	- Geographical distance origin - destination
Sinn et al. (2000)	Germany immigration from 5 Eastern European countries.	Time trend model of partial adjust on which the volume of immigrants progressively converge towards a long run equilibrium level.	Total immigrants volume	- Each origin country income relative to the German income (PPP) - "Output Gap" in Germany - Lagged Endogenous (Proxy for migratory networks) - Proxy for EU membership for each origin country - Proxy for origin-destination free movement of workers
Willekens and Baydar (1986)	Internal migration model (domestic) between dutch municipalities (this is excepcionally included in this review for the shake of its model peculiarities	Linear General Model devoted to time modelization of each one of its three components (see variables details) and to identify, in addition to the effects on exogenous variables, the specific effects of origin, destination and interaction.	Emigration volume between municipalities grouped by urbanization rates for 24 years series.	- Distinguish deparately a 'level component' (total number of immigrants in the country), a generation component (the probability of emigrating from a destination (i) at time (t), and a third distribution component (the probability that an immigrant coming from (i) ends up at a destiny (j) at time (t).
Yang (1995)	Analysis of the origin composition of emigration to the USA for the 1980-1986 period.	Cross section Regression	Average emigration rates to the USA by country of origin 1980-1986.	- Origin country income - Previous immigrant stock by nationality
Zimmermann (1995a)	Migration to Germany from the main 6 origin countries	Lineal regression by Ordinary Less Squares.	Net annual migration from Italy, Greece, Portugal, Spain, Turkey and Yugoslavia	- German Real Gross GDP growth rate - Lagged net immigration - Time trend (in order to capture in a simple manner the push factors) - Dummy for 1973, the year on which Germany abandoned its policy of contracting at origin.

Most of the above researches study the migratory phenomenon in a specific way, focusing on a particular country or group of countries, at a given moment in time, or for a specific type of immigrants. The sample is in that respect fragmentary, but in any case there are some characteristics more or less common to most of these experiences:

- On the type of data and models:

  - Most studies try to explain volume or rates of immigration coming from different origins and with a single destination, either a country or a group of countries. It is quite rare finding models not considering origin as a relevant issue and therefore treating immigration as 'pull-push' theoretical framework, then recurring to data bases with origin and destination variables.

  - There are time series studies, both panel and cross section panel models. Its selection depends upon the analytical objective and it is also conditioned by data availability. If the model is constructed with prospective aims, its specification includes, logically, the time dimension insofar the migratory phenomenon has an important dynamic component.

  - Both cross section and panel data should be used in those studies where there is a marked heterogeneity in the migratory model, either because of its origin, destination or both of them. In those exercises that, for instance, only immigration to, and therefore origin factors are not relevant, panel or cross section panel data are not especially interesting.

  - However, this kind of models are not unusual, notwithstanding they do not explore cross heterogeneity; moreover, they recur to a cross specification or micro panel (few time observations) with clear time forecasting aims.

  - This lack of appropriateness between the analytical objective (markedly time oriented) and the kind of data available lead, in many cases, to forecasts inconsistent with other basic variables from the time reference framework. For instance, the forecasting of total immigrants resulting from aggregating cross

flow forecasts can easily be inconsistent with the demographic total or domestic evolution.

- Several studies associate appropriately panel data with the need to control heterogeneity (by origin, destination or both) in a more sophisticated manner than with the simple solution of recurring to dummies in time regressions. However, recurring to panel data implies facing several technical difficulties that, sometimes, are not adequately taken into account or are dealt with without the needed precautionary measures or without giving enough technical information to the reader.

- It is true that recurring to cross section panel data allows capturing heterogeneity, but most of the origin explicative variables handled in migration are invariant or quasi-invariant to time. This makes it difficult using panel data because of obvious problems of perfect multicollinearity. In order to solve that problem there are several alternatives that are chosen in many studies without justifying the decision in an appropriate or sufficient manner.

- In addition, even if controlling for heterogeneity is used as an argument for recurring to panel data, many times the models limit heterogeneity to estimating an associate coefficient to the simple cross unobservable heterogeneity (random or fixed effects). This is an excessive restrictive heterogeneity scheme when compared with other alternatives that allow for variable coefficients in treating exogenous variables, and an unrestricted cross behaviour in random resids.

- On the other side, migratory models have strong dynamic components (for instance, it is common practice to use lagged variables in order to capture migratory networks effects). Moreover, dynamic panel data models needs specific methods that depend upon important questions such as time and cross section sample sizes, or the hypothesis concerning modelling cross heterogeneity. All these questions are not always considered, recurring to different estimation techniques without a proper technical justification.

- For instance, it is possible to find dynamic analysis with panel data models estimated with pooled OLS that, unless extraordinary conditions, always deliver worst results than other more sophisticated alternatives, according to several technical comparative studies. It is also frequent to find fixed or Random effects estimation methods for models with a small cross section size and high time size, for which recurring to a GMM estimator would offer a better capacity to avoid bias in dynamic panels.

- In general, it could be sensible to conclude that panel data, by exploring together time and cross section dimensions offer higher possibilities for 'configuration' or restriction. In that respect, its results are more sensitive to specification selection and to estimation procedures, generating for the same analytical context very variable results.

- On the variables:

  - The endogenous variable depends upon the analytical context, varying from the measuring of origin-destination immigration flows to immigration over destination population, or more frequently origin population rates (see the comment on flows and/or stocks in the next section).

  - A widely used group of exogenous variables are, logically, different measures of income levels and job opportunities.

  - Income and employment are used as the basic attraction variables, according to economic theories that, in every case, highlight a leading role to comparing origin and destination wages. Usually there are not enough available or reliable information for wages, so it is common practice to recur to income (GDP) and employment/unemployment levels. That is, opportunities are associated to a higher employment level, not to a higher wage level.

  - The combined use of income and employment/unemployment aims to modelling income expectations instead of focusing on gross income differentials: even if both variables are closely linked, it is assumed that immigration is not fostered

by a high income level alone, but induced by the opportunities to access such an income level by finding a job. In that respect, employment rates are used as an aggregate measure of the probability to find a job.

- The most common feature is finding in the models income and employment variables in a separate way, with the exceptions of models in which both are combined in a single variable (income weighted by the inverse of unemployment rates), like Bowles (1997), Straubhaar (1998) and Fields (1991).

- One of the problems associated to using income as an aggregated measure to approximate wage income expectations (in addition to the above mentioned theoretical assumptions) is that it does not measure in an specific way the income received by immigrants, but the average aggregated income of all destination country workers. However, it is clear that the immigrant will get a salary adjusted for a specific sector and qualification level.

- The same happens with using aggregated employment and unemployment measures that may not reflect the specific access conditions to the labour market faced by immigrants. Perhaps because of that, using employment and/or unemployment rates as attraction and/or expulsion factors have not always yielded relevant conclusions concerning the sign of causality (as explained and reviewed by Bauer and Zimermann [1999]). This generally so due to problems in the aggregation procedure.

- Concerning the measuring of destination income, it could be useful to recur to disposable yield (quite rare in the reviewed studies), including taxes and social transfers, because these factors could be important in the selection of alternative destinations if there were significant differences or if those variables had been substantially modified over time.

- When using models that distinguish between different immigrant origins, recurring to the average origin income[7] (instead of a homogeneous wage measure for every country) makes necessary to consider also the average level of competences at origin countries, in order to correctly capture the partial correlation between income and emigration. Introducing inequality levels at the origin country aims to capture the yielding of competences and, in that extent, the positive or negative selection on immigrants according to its origin.

- However, using competences or average education levels (years of studies or any other approximation) is not very common at a macro level, even if its inclusion in some models seems very interesting. On one side, and in a direct way, education levels links with dual market theories, which establish that the bigger the education level, the higher would be the less qualified jobs deficit; and at the same time, the bigger the reluctance to employ them by the locals, because the level of perceived social punishment grows together with its education level. On the other hand, education level is also linked with origin, because a higher education level negatively affects to inequality, and according to relative deprivation theory this impacts emigration positively.

- Income inequality at origin country also appears quite frequently in migratory models. Inequality (usually measured in aggregate average terms) aims to measure poverty trends (filter measure): given an average income, an increase in inequality implies an increase of poverty.

- Inequality allows for the capturing of the deprivation effect (Stark and Taylor, 1989): the decision to migrate is taken at the origin by comparing income with other households. So, the higher income inequality at the origin country, relative deprivation wil rise and the bigger the incentive to emigrate.

- The existence of migratory networks is another of the key factors in the reviewed models. It is generally introduced by including the immigrant stock

[7] It is usually used an origin income measure together with the square income, allowing to keep the assumption of a non-linear emigration-income relation. See the theoretical explanation in Rotte and Vogler, Faini and Venturini (1994).

(usually lagged). An interesting and relatively frequent alternative is to compute the existing stock (total or by nationalities) relative to the origin country population. In any case, using the aggregates stock as a measure of the network is subjected to significant measurement errors, given that not all resident immigrants in a country act as a real migratory support for future immigrants.

- The theoretical models that include the network effect assume that immigration population is homogeneous. Therefore, the same behaviour model is valid for every individual, today and in the future. On the contrary, it may be assumed that emigration as a percentage of origin population is limited, so that a bigger population previously emigrated from a particular origin (over origin population), once it reaches a maximum level only grows by population increase. This hypothesis contradicts the idea that the stock of previous immigrants positively affects new immigration flows. However, it could be compatible with the inclusion of the immigrant stock in the models, assuming that the network effect is a short run effect, insofar as there is an immigration limit as a percentage of origin population.

- Some models recur to some measure of young population at the origin country in order to capture labour supply surpluses caused by the lack of adjustment of population and the labour market. When measuring young population at the origin country what it is being analysed is excess labour demand as well as the higher utility associated to emigration for youngster relative to adults'.

- Variables related to trade or investment relations between origin and destination countries are used to capture the higher employment probability of immigrants coming from economically linked countries. But this relation operates a two levels: (1) it is especially significant for immigrants with higher qualifications, that are able to profit from multinational companies networks, but not for the rest; (2) by contrast, if trade and migration are considered substitutive (Faini and Venturini, 1994), the aggregated effect could be mixed; and (3), there is a problem of cross endogeneity between trade relations and migration (Girma and Yu, 2002).

- None of the reviewed studies includes in a convincing manner questions related to migratory policies, apart from the consideration of dichotomic or scalar dummies in order to model free movement over restriction. One study recur to lagged entry flows to the reference country and other countries (not the immigrant stock, but rather previous years entries) as proxies to measure the ease or difficulty to entry the destination country and other alternative destinations (Mitchell and Pain (2003).

- None of the models clearly distinguish between legal and illegal immigration; many studies do not even mention this issue, and when it is mentioned as an analytical problem, no adjustment in the specification or implementation of the model is proposed.

- On the functional design:

  - Most models adopt a theoretical framework on which the utility fuction has a logarithmic structure, then proposing linear empirical models for the coefficients, but logarithmic or semi-logarithmic for the variables.

  - Many times, notwithstanding that the base empirical model is specified over the variable/s measures by levels, some dynamic adjustment structure is also proposed in order to combine (distinguish) short run and long run analysis: error correction models, simple partial adjustment models, etc.

  - In that respect, it is common to include lagged migratory flows in order to try to capture long run dynamics compared with short run adjustments in a partial adjustment model manner.

  - However, and with only few exceptions, none of the dynamic regression models with variables by levels conduct previous analysis on the stationarity variance of used series, perhaps due to the lack of enough time observations that do not allow carrying out the usual unit root tests.

- On using models for forecasting:

- For most of the reviewed studies, the forecasting exercise basically consist on a simulation exercise, for which some exogenous variables related scenarios are proposed, obtaining a migratory output. In that respect, the quality of the forecast depends upon the quality and plausibility of the proposed scenarios. However, it seems that not sufficient efforts are devoted to properly design such scenarios. The future values assumed for explicative variables are not justified, nor is its plausibility contrasted with other sources or supported with experts' judgements.

b. The difficulties of empirical migratory flows modelling

Following the analysis of the previously reviewed studies, and considering its modelling strategies and results, some general conclusions on the problems facing the empirical modelling of this phenomenon can be obtained. They are, obviously general questions which significance arises according to the analytical context on which each migratory model is formulated.

- The lack of a universally valid theoretical framework

As exposed before, the different migratory theories are unable of convincingly and wholly support to the reviewed simulation and forecasting models. Most of the studies, if not all of them, are only fragmentary based upon general theoretical paradigms. They postulate very basic relations between migrations and some very general economic, demographic and psycho-sociologic concepts, without a minimum degree of precision. These basic theoretical links, presented in a very general manner, should be formalised, being adjusted in an ad-hoc way to the specific circumstances of the analysed place or period, without any homogeneous specific criteria. The results are, quite often, an empirical exercise without a clear theoretical framework or with only fragmentary theoretical elements. These models are reasonably able to offer an ex-post explanation for a particular migratory dynamic or structure. But they are almost useless in conducting forecasting exercises in the same context for which they were prepared.

- The different nature of migratory flows and stocks

One of the most interesting issues lies in the difference between modelling entry immigration flows and the absolute or relative level of immigrant stocks for a country.

Most empirical models focus on explaining the level of immigrants, generally as a percentage of total destination or origin population. By contrast, other studies analyse temporary emigrant flows. The selection of levels (stock) or entry flows is not theoretically, nor empirically irrelevant. From a theoretical perspective (as we will show below) the determinants of a country entry migratory flows are not necessarily the same than the ones that explain the permanence (or return) of the already resident immigrants, and then of the total immigrant stock. On the other hand, and from an empirical perspective, it is evident that analytical objective of understanding and forecasting the flows (short run dynamics) is not the same as dealing with the migratory pressure issue (cumulative, long run dynamics). This needs to adequate the analytical approach to each different case.

Most of the reviewed studies prioritize stock versus flow analysis[8]. This may be due to the higher difficulty of finding entry migratory flow data (gross) instead of immigrant or foreign population data. Evidently, the mere difference between the immigrant stock for period "t" and "t+1" cannot be assimilated to the gross flow, but only to the net flow (entry less exit). The use of the net flow, instead of the gross one, can imply serious bias problems in the estimation of any model coefficients if there is some kind of significant correlation between entry and exit flows. This is so because when using aggregate data the analytical structure tend to mix entry and exit effects that can even result in opposite signs for the same variable[9].

- The distinction between factors explaining the beginning of migratory processes versus factors explaining its perpetuation.

[8] Some authors, like Brucker or Siliverstov (2005) do not share that opinion; it is possible that looking at the whole literature this might be the right conclusion, but according to the summary table included above, the predominance of stock analysis instead that of flows is evident.
[9] This problem is highlighted, among others, by Bauer and Zimmermann (1999)

In a similar manner as entry flows are distinguish from permanence (and therefore from the total stock), sometimes (for instance Massey et al., 1993) the beginning of the migratory process is also distinguished for a country from its perpetuation. So, for instance, some punctual events in origin countries (regime changes, military conflicts, severe economic crisis) as well as in destination ones (changes in the entry or regularization regimes) can serve as catalysers to the start of migratory processes that are then maintained even when those events are already disappeared.

This cumulative causation process is explained by different convincing arguments. First, a good deal of the theoretical models employed as reference framework includes expectations on the migratory decision. In that respect, even if one country's economic situation deteriorates, migratory flows can be sustained if a short or medium run economic recovery is expected. On the other hand, as explained before, the existence of previous migratory networks can perpetuate migratory flows even when the original starting factors have loose intensity. Additionally, there are other reasons (Massey et al., 1998) like the stigmatisation of jobs occupied by immigrants (that natives will never want to do anymore), or the emergence at origin or even destination of an emigration or immigration culture.

- The difficulty of capturing the heterogeneity of the migratory phenomenon

The reasons that motivate the migratory decision crucially depend upon the type of immigrant considered. Evidently, the reasons that foster forced emigration do not coincide with those that could be considered central in explaining voluntary migratory decisions. Even regarding voluntary immigrants, an evident distinction should be made between those who have considered vocational arguments attending to labour reasons; and within them, it is not possible to assimilate those who opted to emigrate as a mechanism of labour promotion (immigrants coming from developed countries) with those motivated by economic survival (coming from developing countries).

So, migratory flows of different kinds are not easy to aggregate as a whole, and should be studied separately. This makes it very complex from an empirical perspective. Even if in some occasions it is possible to find data for the stock or flow of different types of immigrants (the origin country should be enough to adequately differentiate across the

different categories), it is not easy task to make the election of the explicative variables fit this segmentation. In the Spanish case, for instance, the most recent data on resident foreigners distinguish with enough detail immigrants origin, but this detail is not avalaible for some interesting explicative variables.

On the other hand, and even when empirical analysis can focus on an specific category of economic immigration, differences related to origin country or geographical area can still quite significant in the causal migratory model. For instance, immigrants coming from Eastern Europe cannot easily be assimilated to those coming from Latin America, or these with the ones coming from Sub-Saharan Africa. This means that there are specific variables impacting in an isolated manner for each origin. Moreover, those fundamental variables explaining migration in an invariant manner related to origin can affect with a different intensity to immigration depending upon the area where this is originated.

In addition, even when being extremely specific (for instance considering only a single origin country), in fact it could be understood that any macro aggregate analysis contradicts the idea that the migratory decision is essentially a micro economic one. In that respect, some analysts defend the studies based on polls or micro data as the only way to model migratory behaviour, insofar as they permit to consider individual variables (civil status, education level, number of previous emigrant family members…) or variables related to very specific geographical areas.

In any case, and focusing exclusively on macro econometric models, there are several arguments on the necessity to choose modelling strategies that explicitly consider the treatment of heterogeneity according to origin. This especially so when the purpose of the study is explaining not only total migratory flows, but also its composition. Considering origin heterogeneity implies to generate separate models or to recur to econometric strategies that allow some degree of group variability in the estimated coefficients and/or in the variances (like for instance the different panel data model types).

Using panel data models needs more technical resources and makes dynamic modelling more complex. It also introduces the problem of selecting the adequate estimators

according to the source of variance that is being prioritised (time or cross section) and the degree of heterogeneity permitted (parametric restrictions and/or variance decomposition level)[10].

- The empirical complexities induced by illegal immigration

The existence of a high illegal immigration level derived from the imposition of strict entry controls in most 'attractive' countries implies that some of the main variables that can empirically be used to model migratory dynamics include inexact measures. This problem affects, in the first place, to the analysed endogenous variable itself, that is, to the total resident immigrant population. From an econometric perspective, it is obvious that recurring to an endogenous variable with measurement errors inevitably generates not very efficient estimations of the interesting coefficients. This can lead to errors when considering the statistic significance of the explicative variables contained in the model specification.

On the one hand, if endogenous variable measurement errors are related to any of the exogenous variables included in the specification there is the additional risk of bias and inconsistency, invalidating any empirical judgement conducted on the basis of the observed coefficients. This possibility is, on the other hand, relatively plausible if we imagine that measurement errors in immigrant population are linked to the magnitude of irregular immigrant population. This in turn can be connected with explicative variables as important as entry restrictions by particular destination countries.

In addition to the problems related with measurement errors in the endogenous variable, the presence of a high irregular immigration percentage generates also frequently measurement errors in the exogenous variables (for instance in the correct calculation of the unemployment rate offered by labour polls or by wages estimation). These measurement errors constitute a first order 'econometric risk' factor that expose any parametric estimation exercise to bias an inconsistency problems.

[10] Brucker and Siliverstovs (2005) illustrate how, in the panel data context, the selection of the different available estimators influence the estimation results and forecasting mistakes. Álvarez-Plata et al. (2003) argue that the significant differences obtained in the forecasting of migratory flows from Eastern Europe to the EU by different authors are not due to the selection of exogenous variables, but to a bigger extent to different estimation procedures, especially in panel data models.

- The difficulty of integrating migratory policies within empirical models

Evidently, migratory policy is an essential factor in order to understand the characteristics and composition of current international migratory dynamics. Wit some interesting exceptions[11], a good deal of the theoretical analytical proposals are built upon the base of free trans-national movements, which is a clearly unrealistic starting point. Moreover, it can be said relatively safely that international migration towards developing countries is currently strongly guarded. This is the only reason why migrations are so scarce when compared with others production factors mobility in the globalization age. So, empirically considering such a restrictions introduced by migratory policies is very important.

However, the complexities of integrating migratory policies in quantitative exercises are self-evident. In the first place, it is very difficult to demarcate something as diffuse as 'migratory policy'. Even defining it precisely, it is clear that it would be impossible to quantitatively measure its design and/or its implementation in order to include this kind of analysis in the previous econometric model. Secondly, migratory policy is an endogenous variable, influenced by the same forces that determine migratory pressure, making it difficult its econometric treatment as exogenous variable, and eventually introducing bias and inconsistency problems.

- The models endogeneity problem

The immigration phenomenon is usually related to factors or variables that are themselves strongly influenced by migratory flows, frequently inducing in causal models problems linked to endogeneity. For instance, it is evident that economic conditions in destination countries (that acts as an element of immigrants attraction) are in turn modified by immigrants arrivals.

[11] For instance Clark et al. (2002) and Cobb-Clark (1998).

1995-2005 IMMIGRATION FLOWS IN OECD COUNTRIES ORIGINATING FROM ALGERIA, MOROCCO, TUNISIA, TURKEY AND EGYPT

Before focusing on the modelling of bilateral flows between the countries covered by this research, a brief summary of the global results from the last 11 years of migratory flows between the EU-15 and some Mediterranean Partner Countries (MPCs) is offered.

From the perspective of destination countries, Germany, France and Spain represent over 75% of migration flows during this study's period. For Germany and France, Turkish and francophone areas immigration, respectively, have been a continuing reality since the beginning of the 1960's. For Spain, the strong Moroccan immigration flow has taken place during the last 5 years, and still presenting a relevant inflow rhythm today, notwithstanding that the trend has lowered since 2006.

Migratory flows to OECD studied countries 1995-2005 (thousand people)

		FROM					
		Algeria	Egypt	Morocco	Tunisia	Turkey	Total
TO	Belgium	5.974		65.544	4.074	31.225	106.817
	Canada					12.652	12.652
	Denmark			1.577		8.651	10.228
	Finland					2.259	2.259
	France	187.91		176.744	63.034	73.175	500.863
	Germany		18.754	54.529	25.301	588.118	686.702
	Greece		2.193			0.796	2.989
	Hungary					1.247	1.247
	Italy	1.642	26.451	125.418	34.53	6.254	194.295
	Netherlands	0.564	2.745	45.463	0.88	55.14	104.792
	NewZealand		2.101				2.101
	Norway			1.845		4.591	6.436
	Poland	0.513	0.656		0.501	3.012	4.682
	SlovakRepublic	0.018	0.049	0.013	0.041	0.196	0.317
	Spain	28.106	0.544	312.486	0.307	0.604	342.047
	Sweden					10.264	10.264
	Switzerland					31.989	31.989

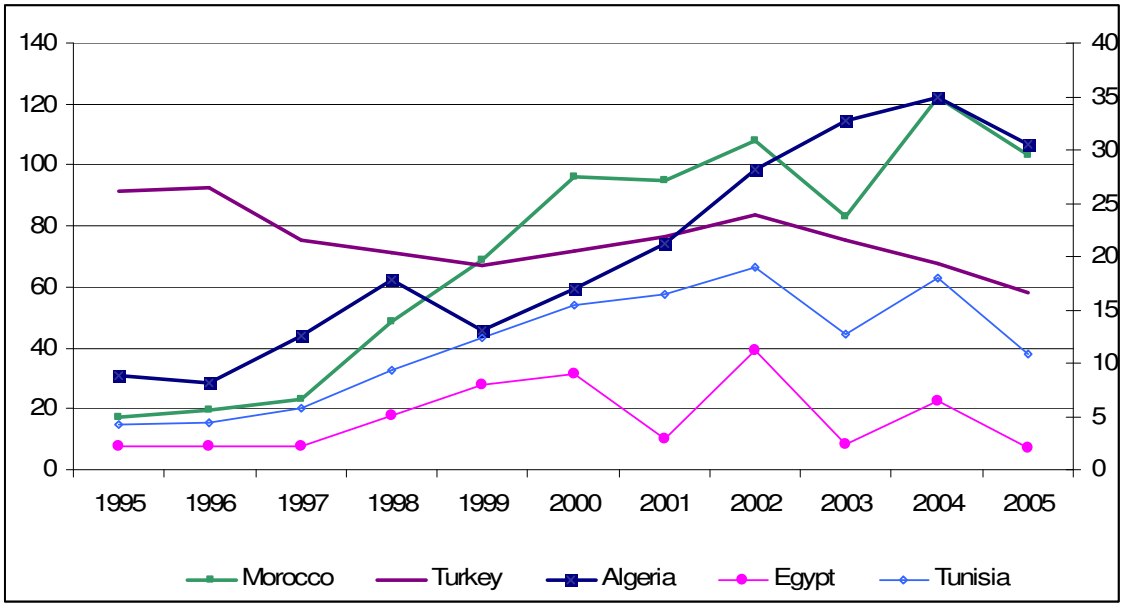
	FROM					
	Algeria	Egypt	Morocco	Tunisia	Turkey	Total
UnitedKingdom			0.675			0.675
Total	**224.727**	**53.493**	**784.294**	**128.668**	**830.173**	**2,021.355**

Source: OECD Migration dataset

From the origin country perspective, among the five countries considered in this research, Egypt's results are the ones that differ the most the general behaviour. Over the last eleven years emigration flows represents and outflow of 2,5% of Moroccan habitants and about 1% of its habitants for Tunisia, Algeria and Turkey. However, Egyptians emigrants during the last decade towards the EU represented only 0,1% of Egyptian population. If the analysis would be conducted at a regional level within each country, the results would be much more relevant, even for the Egyptian case.

Within the time horizon considered in this study, Morocco and Algeria present a growing trend, increasing year by year the number of emigrants sent to the EU-15. Turkey slightly decreases the rhythm of its emigration outflows, but remains at annual emigration levels close to 75.000 people by year. For the Egyptian case, taken into account that figures are much lower, there have been no significant changes over the last decade (see figure below).

Migratory flows towards the EU-15, 1995-2005 (thousand people)



Right axis: Algeria, Tunisia and Egypt. Left axis: Morocco and Turkey.

In short, this study deal with migratory flows that account for close to two million people, or around 1% of the Algerian, Egyptian, Turkish and Moroccan population taken together, that have migrated in the 1995-2005 decade to the EU-15. It is important to highlight this figure because if it seems a relatively low one, it refers to a single decade. Notwithstanding the fact that there are not available data for immigrant stocks by MPCs nationalities, it is obvious that this process implies a very significant loss of MPCs population when these figures are projected over a longer period.

MODEL CHARACTERISTICS

a. Specification

The models used in this research are based upon Hatton (1995) proposal, with a semi-logarithmic specification of the migration decision utility function. The short and long run models are based upon the Brücker and Siliverstov (2005) proposal. The specification includes the variables generally tested for immigration determinants analysis and widely used in the previously reviewed models.

The originality, together with a wide number of proposed cross migratory flows and the updating of information, consists in the inclusion of two variables not very common in the econometric models used to determine this phenomenon: demographic push effects and the variable for income inequality (tested as significative by Mayda [2005]).

The model is specified in the following manner:

$$\log(INMIG_{it}) = \mu_i + \beta_2 \log(GPULL_{it} / GPUSH_{it}) + \beta_3 \log(EMPHOS_{it}) + \beta_4 \log(POTMIG_{it}) + \beta_5 \log(GINHOS_{it} / GINORI_{it}) + \beta_6 \log(DISTAN_i) + \beta_7 \log(INMIG_{it-1}) + \beta_8 LANG_i + U_{it}$$

- Labour-economic pull effects:

    - GPULL/GPUSH: percentage of relative wealth, calculated as destination country over origin country GDP per capita. The coefficient of this variable is expected to be positive.
    - GINHOS/GINORI: inequality in relative income distribution, calculated as Gini income inequality index in the destination country over the origin country. According to the previous arguments, it is expected this coefficient to have a positive sign
    - EMPHOS: employment growth in the destination country (growth in the number of employees). This coefficient is also expected to have a positive sign, because it represents a higher probability of finding a job in the destination country.
    - POTMIG(-1): network or inertia effect from previous immigration flows. The expected sign is positive.
    - LANG: dummy variable that takes value 1 when origin and destination countries have the same language and 0 otherwise. The expected sign is positive.
    - DISTAN: distance in kilometres between origin and destination capital cities. As usual, the distance is taken as square, because over a given

distance a higher one is less important than in the first kilometres. The expected sign is obviously negative.

- GPUSH: labour-demographic push effects, compiled in a single variable generated from:

    - National employment growth in the origin country
    - National activity rate evolution in the origin country
    - Growth of active population: including new potential demand (people having 16 years) and workers exit by retirement or death.

The "i" sub-index refers to the cross of each pair of countries among which migratory flows are taking place (34). The "t" sub-index refers to the year (1995 to 2006). As is common practice in other studies, an equation is proposed in order to define a simple partial adjustment function that some authors call "Persistence habit model", specified as follows:

$$INMIG_{it} - INMIG_{it-1} = \delta(\hat{INMIG}_{it} - INMIG_{it-1}) + w_{it}$$

Substituting this equation in the previous one, short and long run effects of the migratory phenomenon are easily derived.

In the modelling process other widely used variables in migratory flows studies have been taken into account. More precisely, dichotomic variables have been used in order to distinguish if the origin country was a former colony of the destination country or if they share a common border. A variable related to immigration policy in destination countries was also included. None of them were significative, so they were finally excluded in the chosen model expression.

b Estimation methods and software

Recent econometric techniques have developed a huge quantity of alternative estimators in order to estimate panel data models in general, and in a particular manner models including dynamic elements in its specification. This is our case when introducing the network effects variable. Among others, we can consider the following ones:

- OLS estimators with stacked variables, with and without cross-section variables.
- Dynamic panel data estimators with fixed effects (and without cross-section variables), under homokedasticity or heteroskedasticity/autocorrelation assumptions.
- Random Effects estimators following Wallace and Hussain (1969), Swamy and Arora (1972) proposals or feasible GLS.
- Dynamic Panel Data estimators following the proposals of Hsiao (1992) or Arellano y Bold (1991).
- GMM estimators of Arellano and Bover (1995).

As stated in the section devoted to previous modelling experiences, almost generally econometric studies conducted to date have recurred to OLS estimators with stacked data methods. Only a few of them have recurred to fixed effects estimation methods. Brücker and Siliverstovs (2005) analyse in detail all the commented alternatives, testing its capacity to obtain closer estimated and real results. In this study the conclusions are the following:

- The differences obtained by using alternative estimation options are significant in estimating the relative importance of each explicative variable.
- They find that, for the models they work with (similar to ours), OLS estimators are clearly less precise than the one obtained by other alternatives.
- They observe that, in such a context, fixed effects estimators have clear advantages over the remaining options, including specific estimators for dynamic panel models, and that the high number of observations annulate the bias described by Arellano and Bold (1991).
- The authors find that Random effects estimators present goodness skills similar to fixed effects ones, showing that they are very close to dynamic panel data estimators.

Following these results, and beyond academic econometric fun, in our model we have opted for using Random effects estimators corrected by heteroscedasticity and autocorrelation. The reasons are the following:

- Economic literature shows the importance of specific effects in the bilateral relation between the different origins and destinations of migratory flows. Recurring to a fixed effect model would make it impossible its inclusion in the model. Moreover, as exposed below, these variables are significative.
- From the classical methodological perspective, apart from the specific effects of each bilateral flow computed through cross section variables in the model, it is obvious that unobservable Random effects persist, having to be considered in the specification of each country crossing.
- The obtained results are similar to the ones presented in other studies for different geographical areas, which have been widely tested.

The estimation has been conducted with the E-Views 5.1 software, which have capacity enough to compute this kind of estimators.

c. Data sources and data transformations

In order to analyse emigration macroeconomic determinants the following variable have been used:

GDP per capita in PPP, with IMF's World Economic Outlook (WEO – IMF) historical data to 2007 and estimations afterwards.

The demographic evolution of analysed countries has been obtained from population projections in the United Nations data base 2007 Project, with country five-year data available until 2050. In order to use this variable in the model, five-year observations have been interpolated to obtain yearly observations.

To measure wealth inequality between origin and destination countries, an index has been generated over the average of EU receiving countries. The base is data generated by the United Nations statistical division (World Development Indicators).Yearly data were interpolated through a geometric progression.

Occupied population data came from WDI, ILO and IMF data bases. The series were presented with some methodological changes, especially for Morocco and Algeria in the years 2000 and 1999, respectively. In order to homogenise historical series the bridge year between both methodologies was interpolated and its evolution was projected backwards maintaining yearly growth rates.

The evolution of this series to the year 2050 has been captured by three different scenarios: (i) maintaining average growth of the last 10 years; (ii) fixing an average annual growth of 5%; or (iii) keeping a 10% annual growth rate.

Physical distances between origin and destination migration capitals are obtained from the web page: http://www.chemical-ecology.net/java/lat-long.htm.

Shared border, common language and former colony status variables are dichotomic variables generated by the authors.

In order to measure the different receiving countries immigration policies we have used the recently created Migrant Integration Policy Index (MIPEX), available at http://www.integrationindex.eu/.

Bilateral origin-destination flows between countries came from OECD migrations data base. Unemployment rates came from the same source.

The evolution in the number of employees came from the IMF Monthly Statistics Bulletin, completed with the tendencies observed by the discontinuous ILO series. For the different simulations to year 2050 we have used a central scenario derived from the median of its growth in the last 15 years. Two other scenarios represent 10% higher and lower situations over this median value.

To determine the past activity rates we have used ILO interpolated data, and for the future, the observed trend over the last decade has been progressed.

ESTIMATION RESULTS FOR THE DEMOGRAPHIC PUSH EFFECT IN ALGERIA, MOROCCO, TUNISIA, TURKEY AND EGYPT

As exposed in previous sections, the objective of estimating potential migratory pressure is not focusing the analysis in individual periods, but rather in the trends reflected by the series constructed to that end. It should be highlighted one more time that punctual time series intervening in the estimation of this indicator suffer from several interruptions and discontinuities in the past, so the results exposed here should be considered with some caution. Finally, we have to take into account again that for estimating these values we have recur to population by age projections offered by the UN statistical division. So, the results could experience drastic changes if these projections were not adjusted to reality.

The results showed are a keystone in the proposed migratory flow model. As exposed before, one of the main findings of this research is the relevance of this variable, at least in the context of the analysed countries in North Africa and Turkey.

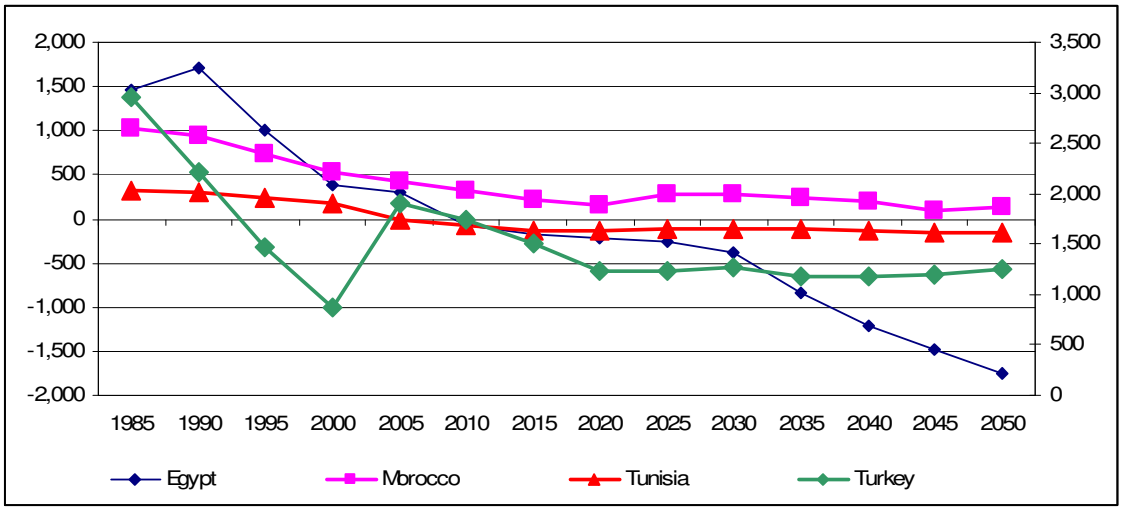
According to the estimation method employed (see above), migratory potentials are calculated from the perspective of new labour demand and supply flows for each country and year. Stocks are not being determined. In this respect, we talk about a "migratory potential" depending upon the unbalance in the internal labour market that would partially be covered by domestic unemployment and partially by emigration.

Subjected to these important considerations, the following table shows our results on the evolution of the potential emigrants' variable from each of the considered countries. They are some how 'forced' to emigrate given the demographic characteristics of its origin country (as a result of labour demand) and its capacities to absorb them (labour supply).

Estimation of potential migration (migratory pressure, thousand persons)

	Algeria	Egypt	Morocco	Tunisia	Turkey
1985	690	1,453	1,018	331	2,960
1990	-286	1,710	940	297	2,218
1995	-9	997	732	234	1,476
2000	-31	386	524	170	870
2005	-35	309	421	-11	1,897
2010	-8	-70	312	-64	1,740
2015	-197	-183	220	-131	1,510
2020	-107	-212	155	-131	1,226
2025	-58	-252	281	-117	1,225
2030	26	-374	290	-116	1,268
2035	35	-838	248	-118	1,173
2040	-37	-1,210	193	-133	1,183
2045	-104	-1,485	86	-146	1,188
2050	-18	-1,749	129	-148	1,260

Source: own calculations



Left axis: Egypt, Tunisia and Morocco; Right axis: Turkey

In the data above, positive signs should be understood as potential migrants for not finding jobs in their origin country. The negative sign would be associated to a higher

national labour supply than the one the country is able to generate by way of new workers entry into the labour market.

According to the obtained results, the following considerations can be made:

- For the whole countries analysed, migratory pressure shows a decreasing trend (with an inflexion point for the Turkish case in year 2000 that afterwards regain this increasing trend).
- Egypt and Tunisia show a clear labour deficit already from the current five-year period and for the whole prediction horizon.
- Algeria could present during the 2030's decade a slight gap between its labour supply and demand, but on the whole, the country will be net labour demanding, not a migrant supplier according to migratory pressure concerns.
- Morocco and Turkey are clear net emigration suppliers over the next 40 years, with a slightly negative trend during the considered prediction horizon; however, a strong surplus in the national labour market is still observed.

There are, for sure, other non economic determinants that are not being analysed here, but that could be consider in the future for cases like Tunisia or Algeria.

Focusing on the Turkish case, its potential accession to the EU after 2012 could drastically change its employment growth pattern, as well as its adjustment towards more industry-oriented productive structures, less dependent on agriculture. In that respect, employment growth dynamics in Turkey could experience serious changes derived from the very different apparent labour productivity in economies with an important agricultural base compared to a more industrial economic structure. So, these results should be taken cautiously, but it is clear that the opposite effect of these two effects (on the one hand, reduction of GDP agricultural weight and higher industry productivity, leading to a smaller labour demand; and on the other hand higher growth due to a potential accession to the EU, with the subsequent increase in labour demand) signal a path of strong demographic surplus even in the presence of profound changes.

For the Moroccan case, it does not seem that the reduction of the agricultural sector weight would be neither as imminent nor as important. In that respect, the results can be presented as more probable, both in trend and approximate quantity of the "population surplus".

For Algeria, the low data reliability asks for being especially cautious with the obtained results. Its historical data series still presenting a high degree of discontinuities a atypical observations that are difficult to reconcile when compared with other indicators for the same country.

MODEL MAIN RESULTS AT THE 2006-2050 HORIZON

The model has been estimated for the 30 migration flows among Algeria, Egypt, Morocco, Tunisia and Turkey, on the one side, and the EU-15 countries on the other. The historical period goes from 1996 to 2005, and has a total of 34 crossings, then including 235 observations after having eliminated some data for which statistical data for some variable was not available.

The coefficients and the Random effects were estimated following the Swamy and Arora (1972) proposal, as well as the White correction of cross heteroscedasticity and autocorrelation in the coefficients estimation. The purpose is to adequately present data cross heterogeneity and avoid possible bias effects in the coefficients with a more efficient system that the usually implemented proposed by Multon.

Model regression results

(Estimated Random effects coefficients are presented in annex 1)

Dependent Variable: LOG(INMIG?)
Method: Pooled EGLS (Cross-section Random effects)
Sample (adjusted): 1996 2008
Included observations: 13 after adjustments
Cross-sections included: 31
Total pool (unbalanced) observations: 304
Swamy and Arora estimator of component variances
White cross-section standard errors & covariance (d.f. corrected)
Cross sections without valid observations dropped

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.081315	0.766822	-6.626456	0.0000
LOG(GPULL?/GPUSH?)	0.373841	0.150818	2.478752	0.0137
LOG(DISTAN?^2)	-0.213002	0.053415	-3.987698	0.0001
LOG(POTMIG?+1750)	0.880322	0.100151	8.789983	0.0000
LOG(EMPHOS?)	0.128432	0.028521	4.503021	0.0000
LANG?	0.098136	0.078265	1.253891	0.2109
LOG(INMIG?(-1))	0.894312	0.016437	54.40781	0.0000
LOG(GINHOS?/GINORI?)	0.762152	0.244610	3.115785	0.0020

Effects Specification	S.D.	Rho
Cross-section random	0.079135	0.1224
Idiosyncratic random	0.211882	0.8776

Weighted Statistics			
R-squared	0.962380	Mean dependent var	0.487679
Adjusted R-squared	0.961490	S.D. dependent var	1.189834
S.E. of regression	0.233491	Sum squared resid	16.13740
F-statistic	1081.737	Durbin-Watson stat	1.800898
Prob(F-statistic)	0.000000		

Unweighted Statistics			
R-squared	0.981591	Mean dependent var	0.823460
Sum squared resid	17.82230	Durbin-Watson stat	1.630643

On the previous results the following considerations can be made:

- All the included explicative variables were significant at a 95% confidence level, with the exceptions of the relative income ratio (90%) and the common language variable (85%).
- The observed signs in every coefficient correspond to the expected ones.
- The model reaches a high explicative capacity (a 97% R-square)
- The common border and colonial past were discarded for not being statistically significant.
- For common borders, given that we have considered only flows from North Africa and Turkey towards the EU-15, this variable would be close to constant, precisely because most flows happen between countries with a common border. We are not discarding its real importance, but it is not possible to estimate an associate coefficient due to perfect multicollinearity problems.
- From the standardized common coefficients analysis can be inferred that the most relevant variables in the determination of migratory flows would be, in the first place, the 'network' effect, and in second term the 'push effect', far away from the relative importance of the remaining explicative variables.

	Coefficients	Standarized Coefficients
LOG(INMIG(-1))	0.894	0.985
LOG(POTMIG)	0.880	0.473
LOG(EMPHOS)	0.128	0.071
LOG(GINHOS/GINORI)	0.762	0.059
LOG(GPULL/GPUSH)	0.374	0.035
LOG(DISTAN^2)	-0.213	-0.083

- The two new variables included in the model are clearly significative (migratory potential and income inequality ratio), confirming our initial theoretical considerations. Of especial relevance is the migratory potential case in explaining the flows, showing that, for the considered countries, this variable trend is a relevant factor when trying to forecast the migratory flows that the EU-15 would receive, by contrast to what would be concluded from other studies that includes a higher number of countries.

- Comparing the coefficients obtained with a wider model for the whole OECD migratory flows (see annex II for the results of such an estimation), it can be seen that relative income (GDP quotient), employment growth and network effect coefficients are very stable.

Coefficients comparison: OECD as a whole and objective model

	Total	Objetivo
LOG(GPULL?/GPUSH?)	0.204568	0.373841
LOG(DISTAN?^2)	-0.014467	-0.213002
LOG(EMPHOS?)	0.122302	0.128432
LANG?	0.227818	0.098136
LOG(INMIG?(-1))	0.901104	0.894312

- On the opposite side we have the distance (that, in addition, are not significant for the whole OECD model) and the language variables. The importance of distance increases, but language is not statistically significant. Obviously, in this second modelling framework two important migration types are being considered: on the one hand, non-economic migration, led by completely different variables; and on the other hand, the migration component coming from Latin America, very important for Spain, the country which has received the higher number of immigrants during the last years. On the other hand, in the whole OECD model the income inequality was not statistically significant neither (however, the low reliability of these WDI data for such a wide sample of countries make it doubtful that this result originates from data quality instead of the real incidence of the variable).

It is well known that including a lagged variable is a practice that needs especial cautiousness in regression models (see previous section about literature models). It only make sense to the extent that there is strong theoretical support that confirm its applicability (such as the migratory models due to its strong and contrasted characteristics both concerning inertia and network effects). Anyway, it is interesting to test which part of the migratory phenomenon may be explained with the remaining explicative variables. In that respect, over 34% of the model explicative capacity is due

to the other considered variables, which helps to nuance to some extent the simple network behaviour.

The value of the network effect variable coefficient is close to 1 (it goes within the confidence interval between 0.85 and 0.93, at the 95% confidence level). The model shows a strong persistence habit for the analysed countries, at least during the considered period. This value is in contrast with the ones obtained by other migratory flow models in the literature that do not include migratory potential effects. Those models point to network effects coefficients between 0.65 and 0.75. It should be made clear that by widening the sample to a bigger group of countries and generally to a longer time period what it is being considered are mature migration destinations. These have almost no significant flows over the last years and they have an important resident foreign population for generations, so it is normal that network effects are diluted when origin country links start to vanish.

For the countries in this study, it is especially interesting to analyze the political change on the emigration issue in Morocco over the last years. The Moroccan government has greatly transformed its policy towards emigrants. While in the past it used to be considered as a waste of national human capital, lastly it has focused on fostering maintaining emigrants-origin areas relations. This is a bet to increase both the return potential and remittances. This strategy goes along the line of empowering network effects.

In the Turkish case, network effects are important given the existence of a significant immigrant colony in their preferred destination countries (mainly Germany). Not withstanding the existence of second generation Turks (then diluting origin country links), the strong concentration of immigrants in some places offers a definitive incentive to emigration.

For Algeria, recent French colonial past acts in a decisive manner after independence to de-link residents in the metropolis with its roots. However, again the strong concentration of Algerian citizens in France acts as a strong attraction factor to this destination.

ALTERNATIVE SOCIO-ECONOMIC POLICY SCENARIOS IN ORIGIN COUNTRIES

Six different scenarios are proposed in order to simulate immigrant flows to be received by each EU-15 country from the considered MPCs:

1. Business as usual: Median growth for all variables, similar to the one experienced as geometric average during the last eleven years.
2. Slow convergence: Relatively slow convergence of MPCs towards European per capita income levels, gaining 10 convergence points annually every coming year.
3. Fast convergence: Relatively fast MPCs convergence towards European per capita income, of 20 convergence points annually every coming year.
4. Social Policies: Social policy measures that reduce income inequality by 10 points in MPCs.
5. Slow employment growth in the origin country that would reduce potentially migrant population.
6. Fast employment growth in the origin country that would further reduce potentially migrant population.

1. The following table shows these simulations' results, which are also represented graphically by country.

Summarized simulation results of bilateral immigration flows for the 2006-2050 period (number of people)

From	To	scenario 1 Business as usual		scenario 2 Slow convergence		scenario 3 Fast convergence		scenario 4 Social policies		scenario 5 Slow employment growth		scenario 6 Fast employment growth	
		Annual average	Summation 2006 /50	Annual average	Summation 2006 /50	Annual average	Summation 2006 /50	Annual average	Summation 2006 /50	Annual average	Summation 2006 /50	Annual average	Summation 2006 /50
Turkey	**Austria**	5,292	68,801	4,392	57,101	3,601	46,819	3,843	49,958	4,090	53,168	3,455	44,918
Algeria	**Belgium**	565	7,341	460	5,974	369	4,798	396	5,154	515	6,696	520	6,761
Morocco	**Belgium**	3,166	41,161	2,677	34,804	2,241	29,127	2,375	30,871	2,778	36,120	2,648	34,418
Tunisia	**Belgium**	196	2,548	167	2,173	141	1,834	149	1,939	183	2,381	185	2,406
Turkey	**Belgium**	2,283	29,676	1,899	24,686	1,561	20,290	1,664	21,633	1,769	23,000	1,497	19,466
Turkey	**Finland**	376	4,883	301	3,909	237	3,082	256	3,331	277	3,606	228	2,962
Algeria	**France**	16,246	211,195	13,341	173,433	10,825	140,723	11,589	150,657	14,877	193,400	15,012	195,157
Morocco	**France**	11,412	148,362	9,549	124,140	7,900	102,704	8,405	109,266	9,940	129,219	9,448	122,828
Tunisia	**France**	3,148	40,930	2,686	34,921	2,269	29,497	2,398	31,170	2,942	38,246	2,973	38,648
Turkey	**France**	7,061	91,787	5,838	75,890	4,765	61,949	5,092	66,202	5,428	70,565	4,569	59,399
Egypt	**Germany**	492	6,398	429	5,573	370	4,808	388	5,046	457	5,945	455	5,914
Morocco	**Germany**	1,625	21,126	1,390	18,065	1,177	15,298	1,242	16,152	1,438	18,688	1,373	17,850
Tunisia	**Germany**	643	8,355	558	7,259	481	6,250	505	6,563	605	7,860	610	7,926
Turkey	**Germany**	18,436	239,669	15,568	202,386	13,003	169,037	13,791	179,285	14,568	189,389	12,483	162,278
Algeria	**Netherlands**	60	786	48	629	38	496	41	536	55	712	55	719
Egypt	**Netherlands**	154	2,002	133	1,724	113	1,470	119	1,549	143	1,857	143	1,856
Morocco	**Netherlands**	986	12,813	829	10,780	690	8,976	733	9,529	862	11,205	820	10,666
Tunisia	**Netherlands**	41	537	35	456	30	384	31	406	39	501	39	506
Turkey	**Netherlands**	2,293	29,815	1,896	24,642	1,547	20,115	1,653	21,495	1,763	22,919	1,485	19,299
Algeria	**Spain**	16,428	213,564	12,534	162,944	9,349	121,534	10,295	133,833	14,579	189,528	14,772	192,037
Morocco	**Spain**	92,263	1,199,425	73,554	956,200	57,711	750,237	62,480	812,239	77,736	1,010,563	73,177	951,297
Turkey	**Spain**	587	7,637	462	6,007	357	4,639	388	5,049	424	5,512	343	4,454
Turkey	**Sweden**	672	8,733	558	7,251	458	5,951	488	6,347	520	6,756	440	5,715

Source: own calculations

The main points to be highlighted concerning countries are:

1. Scenario 1, being the closer in time does not seem to be the most probable one, because during the last decade Southern Member States have registered an unprecedented average immigration growth. A more plausible evolution points to a smoother growth scenario in the future. Anyway, the total amount of immigrants entering the EU-15 during the 45 projected years would be approximately 2.4000.000. The lower scenario points to 1.500.000 immigrants.
2. As expected, in any of the described scenarios the higher numbers of immigrants came from those countries with a higher labour force surplus during the projected period. These are Morocco and Turkey, due to its demographic migratory potential.
3. Morocco will experience an origin population reduction between 1.422.000-906.342 people in the higher and lower scenarios respectively.
4. For Turkey, the interval would be between 481.000-318.000 migrants.
5. For Tunisia, the considered scenarios obtain a much more modest figure for the 45 projected years, between 52.000-37.000 migrants.
6. For Egypt, projected flows are clearly insignificant.
7. For Algeria, the scenarios point to a band between 432.000-290.000 migrants.

Concerning scenarios:

2. The business as usual scenario is, as stated before, the one that tends to show a higher number of immigrants over the long run.
3. The slow convergence scenario reduces slightly the number of immigrants, reflecting that a moderate convergence pattern in MPC's economies does not imply a significant reduction of immigrants.
4. The fast convergence scenario is the one that projects the lower figures of MPC's immigrants, but even in this case the numbers still very significant.
5. The social policy, income inequality reduction, scenario also projects lower immigration figures, but does not alter the trend of migration towards the EU.
6. The low employment growth scenario generally shows lower immigration figures than the business as usual one, but numbers still high.

7. The high employment growth scenario projects a further reduction of MPC's-EU migration, but a smaller one that the projected under the fast convergence or social policy scenarios.

FINAL REMARKS

When incorporating this chapter's results to the previous sections of this research we can point out the following conclusions

The first conclusion is that network effect is confirmed as a fundamental factor in explaining annual immigrant flows to each destination in EU-MPC's migratory dynamics.

Second, the two new variables included in the analysis are clearly significative (migratory potential and income inequality ratio), confirming our initial theoretical assumptions. Migratory potential is especially relevant in explaining immigration flows. By contrast to other studies that include a bigger country group, our results show that for MPCs this variable's trend is a very relevant factor in predicting migratory flows to be received by the EU-15. Income inequality is also important as a migratory driver towards the EU by MPC's migrants.

Third, the results of simulating different scenarios to estimate immigration flows highlight the following figures:

- The total period summation would be of approximately 2,400,000 immigrants entering the EU-15 during the 45 projected years. In the lower scenario this figure goes down to close to 1,500,000 immigrants.
- For any scenario, as expected, the higher numbers of immigrants came from Morocco and Turkey, the countries with a higher labour force surplus due to its demographic migratory potential.
- Morocco will experience an emigration flow between 1.422.000-906.342 people in the higher and lower scenarios, respectively.

- Relating this figure with the potentially emigrant population previously estimated (3,8 million people for the 2005-2050 period), migration flows from Morocco could oscillate between 23% and 37% of this population segment.
- For Turkey, the interval would oscillate between the lower figures of 481.000-318.000 migrants.
- For Tunisia, the considered scenarios project more modest figures between 52.000-37.000 migrants.
- For Egypt, projected migratory flows to the EU-15 are not significant.
- For Algeria, the scenarios point to a migratory band between 432.000-290.000 migrants.

Fourth, from this perspective, under any scenario immigration flows remain significant and it is evident that migratory pressure will not be properly faced only by recurring to Europeanised control and return policies, and that Europeanised integration policies are clearly needed.

Fifth, differences across scenarios are significant in the numbers, not in the trends. The scenarios with he lower immigration figures are the fast convergence and the social policy ones. This implies that the EU should prioritise accelerating fast convergence and implementation of social redistributive policies in MPC's countries. However, these measures will, at best, slightly reduce the number of immigrants. Socio-economic-demographic logic allow for different futures, but in any of them immigration will be a key driver of EU-MPC's relations and of internal EU demographic dynamics.

References

Alho, J. (1998). A stochastic forecast of the population of Finland. Reviews 1998/4. Statistics Finland, Helsinki.

Alho, J., y B. Spencer (2005). Statistical Demography and Forecasting. Springer, Berlin Heidelberg.

Alecke, B., P. Huber, y G. Untiedt. (2001). "What difference a constant makes? How predictable are international migration flows?". En Migration policies and EU enlargement. The case of Central and Eastern Europe. OECD, Paris, pp. 63–78.

Alvarez-Plata, P., H. Brücker y B. Siliverstovs (2003). Potential Migration from Central and Eastern Europe into the EU-15 – An Update. Report for the EC DG of Employment and Social Affairs. Deutsches Institut für Wirtschaftsforschung, Berlin.

Arango, .J (2003). "La explicación teórica de las migraciones: luz y sombra". Migración y Desarrollo. Número 1. Octubre 2003.

Arellano, M. and R.S. Bond (1991): Some test of specification for panel data: Monte Carlo evidence and application to employment equations. Review of Economic Studies 58. Pp: 277-297.

Arellano, M. and O. Bover (1995): Another look at the instrumental-variable estimation of error-components model. Journal of Econometrics 68, Pp: 29-52.

Bauer, Thomas K. and Klaus F. Zimmermann (1999) Assessment of Possible Migration Pressure and its Labour Market Impact following EU Enlargement to Central and Eastern Europe. Study for the UK Department of Education and Employment. Institute for the Study of Labour (IZA), Bonn, Centre for Economic Policy Research (CEPR), London.

Bijak, J. (2006) Forecasting International Migration: Selected Theories, Models and Methods. CEFMR Working Papers. 4/2006. Warsaw.

Boeri, T. y H Brücker (2001). Eastern Enlargement and EU Labour Markets: Perceptions,challenges and Opportunities. IZA Discussion Paper 256. Institut zur Zukunft der Arbeit, Bonn.

Böhning, W.R.; Schaeffer, P.V.; Straubhaar, Th. (1991). Migration pressure: What is it? What can one do about it? (Geneva: ILO, Working Paper No. 55).

Borjas (1987). "Self – Selection and the Earnings of Immigrants". American Economic Review. Vol. 77, Nº 4, pp.531-553

Borjas, G.J. (1989), "Economic theory and international migration". International Migration Review, 23, 457-485.

Borjas, G.J. (1994), "The economics of immigration". Journal of Economic Literature, 32, 1667- 1717.

Borjas, G.J. (1999a), "Economic research on the determinants of immigration: Lessons for the European Union". World Bank Technical Paper No. 438.

Borjas, G.J. (1999b), The economic analysis of immigration. En Handbook of Labor Economics Volume 3A, (eds. Ashenfelter, O. and Card, D.), Elsevier, North Holland.

Bowles, S. (1970): "Migration as Investment: Empirical Tests of the Human Investment Approach to Geographical Mobility," The Review of Economics and Statistics, 52, 356-362.

Brücker, H., y B. Siliverstovs (2005). On the Estimation and Forecasting of International Migration: How Relevant is Heterogeneity Across Countries. IZA Discussion Paper 170. Institut zur Zukunft der Arbeit, Bonn.

Bruni, M.; Venturini, A. (1995). "Pression migratoire et propension à émigrer: le cas du bassin méditerranéen", Revue Internationale du Travail, Vol. 134, n. 3 (Genève: BIT).

Burniaux, J.-M., R. Duval and F. Jaumotte (2004). Coping with Ageing. OECD Economics Department Working Papers, No. 371, OECD, Paris.

Clark, X., T.J. Hatton y J.G Williamson. (2002). "Where do US immigrants come from?. Policy and Sending Countries Fundamentals". NBER Working Paper Nº 8998, Cambridge.

Cobb-Clark, D.A. (1998). “Incorporating US Policy into a Model of Immigration Decision”. Journal of Policy Modelling. Vol 20, nº 5, pp. 621-630.

Caixa Catalunya (2007): Report monográfico: los cambios en la tasa de dependencia en España y la contribución de la inmigración. Consumo y economía familiar. N. 46 Marzo 2007.

Conde Ruíz, J.I. et al. (2006) “El Sistema de Pensiones en España ante el reto del Envejecimiento”. Presupuesto y Gasto público 44/2006. Instituto de Estudios Fiscales.

CPB [Centraal Planbureau] (2004). Arbeidsmigratie uit de Midden- en Oost-Europese toetredings-landen [Labour migration from the Central and Eastern European accession countries]. Notice to the Dutch Ministry of Social Affairs and employment. CPB, The Hague.

De Beer, J. (1997). “The effect of uncertainty of migration on national population forecasts: the case of the Netherlands”. Journal of Official Statistics, 13(3), pp. 227–243.

Faini, R. y A. Venturini (1994). "Migration and Growth: The Experience of Southern Europe," CEPR Discussion Paper No.964.

Faist, T. (2000). The Volume and Dynamics of International Migration and Transnational Social Spaces. Oxford University Press, Oxford.

Fertig, M. (2001). “The economic impact of EU enlargement: assessing the migration potential”. Empirical Economics, 26, 707-720.

Fields, G.S. (1991). "Place-To-Place Migration: Some New Evidence". The Review of Economics and Statistics, 61, 21-32.

Ghatak, S., P. Levine y S. Wheatley Price (1996), “Migration theories and evidence: an assessment”. Journal of Economic Surveys, 10, 159-198.

Giubilaro, D. (1997): Migration from the Maghreb and migration pressures: current situation and future Prospects. International Migration Papers number 15 of International Labour Office (ILO), August, 1997.
http://www.ilo.org/public/english/protection/migrant/download/imp/imp15e.pdf

Glover, S., C. Gott, A. Loizillon, J. Portes, R. Price, S. Spencer, V. Srinivasan y C. Willis. (2001). Migration: an economic and social analysis. RDS Occasional Paper No. 67, The Home Office.

Harris, J. R., y M. P. Todaro, (1970). "Migration, unemployment and development: A two sector analysis". American Economic Review. 60(1), pp. 126–142.

Hatton, T. J. (1995). "A Model of U.K.Emigration, 1870-1913". Review of Economics and Statistics. 77, pp. 407-15.

Hatton, T.J. (1995): A model for UK migration 1870-1913. Review of Economics and Statistics 77 (3), Pp: 407-415.

Hatton, T. J., y J. G. Williamson (1998). The Age of Mass Migration: Causes and Economic Impact. Oxford University Press, Oxford.

Hatton, T.J. y J. G. Williamson (2002), "What fundamentals drive world migration?". CEPR Discussion Paper No. 3559.

Hatton y Wiliamson (2004): ¿cuáles son las causas que mueven la migración mundial? Revista Asturiana de Economía - RAE Nº 30 2004

Hooghe, M., A. Trappers, B. Meuleman, and T. Reeskens (2008): Migration to European Countries: A Structural Explanation of Patterns, 1980–2004. International Migration Review Pp: 476-504.

Izquierdo, A. (Dir) (2003). Inmigración, mercado de trabajo y protección social. Consejo Económico y Social. Colección de Estudios. Madrid.

Jasso, G., M. R. Rosenzsweig y J. P. Smith (1998). "The changing skill of new immigrants to the United Status: recent trends and their determinants". NBER Working Paper 6764, Cambridge.

Jennissen, R. (2004). Macro-economic determinants of international migration in Europe. Dutch University Press, Amsterdam. http://irs.ub.rug.nl/ppn/267541740.

Kamemera, D., V.I. Oguledo, y B. David. (2000). "A Gravity Model Analysis of International Migration to North America". Applied Economics, Vol. 32, Nº 13, pp. 1745-1755.

Keilman, N., D. Q. Pham y A. Hetland (2001). Norway's Uncertain Demographic Future. Statistics Norway, Oslo.

Lee, E. (1966). "A theory of Migration". Demography, vol. 3, 1, pp. 47–57.

Lewis, W. A. (1954) "Economic Development with Unlimited Supplies of Labour". Manchester School of Economic and Social Studies, 22, pp. 139–91.

López Cobo, M (2007). Demographic Migration Data in Spain. Workshop: "Impact of Immigration on HIV and Tuberculosis Epidemiology in the Mediterranean Area".

Lutz, W., W. C. Sanderson y S. Scherbov, (eds.) (2004). The End of World Population Growth in the 21st Century: New Challenges for Human Capital Formation and Sustainable Development. Earthscan, London.

Massey, D. S., J. Arango, G. Hugo, A. Kouaouci, A. Pellegrino y J.E. Taylor (1993)."Theories of International Migration: Review and Appraisal". Population and Development Review, 19(3), pp. 431–466.

Massey, D. S., J. Arango, G. Hugo, A. Kouaouci, A. Pellegrino y J. E. Taylor (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 Bonn, Discussion Paper No. 1590. May 2005

Mincer, J. (1978). "Family Migration Decisions". Journal of Political Economy, Vol. 86, Nº 5, pp. 749-773.

Mitchell, J. y N. Pain (2002), "The determinants and methods of modelling international migration: an overview of the literature", mimeo, NIESR.

Mitchell, J. y N. Pain (2003). "The Determinants of International Migration into the UK: A Panel Based Modelling Approach," NIESR Discussion Papers 216, National Institute of Economic and Social Research.

Namkee A., J.A. Meseguer y J.A. Herce. "Gasto sanitario y envejecimiento de la población en España". Documentos de trabajo Fundación BBVA. Número 7. 2003.

Öberg, S., y A. B. Wils, (1992). East-West migration in Europe. Can migration theories help estimate the numbers?. Popnet, 22, pp. 1–7.

OCDE (2000), Reforms for an Ageing Society, OECD, Paris.

OCDE (2006), Ageing and Employment Policies, series, OECD, Paris.

OCDE. Factbook. 2007.

OCDE. MTAS, "Envejecimiento. y políticas de empleo. España". Colección Informes OCDE. Madrid, 2004.

Orłowski, W. (2000). Migration from central and eastern European countries after the accession: Effects for regions, labour markets, and social security systems. Research Bulletin, 2(9), Central Statistical Office, Warsaw, pp. 7–21.

Otero, Á. y M.V, Rodríguez- Laso (2004). "Volumen y tendencias de la dependencia asociada al envejecimiento en la población española". Revista Española de Salud Publica. Mar.-abr. 2004, Vol.78, no.2, pp. 201-213.

Pries, L. (1999). Migration and Transnational Social Spaces. Ashgate, Aldershot.
Ranis, G. y J. C. H. Fei (1961). " A Theory of Economic Development". American Economic Review, 51, pp. 533–65.

Ravenstein, E. G. (1885–1889) "The Laws of Migration". Journal of the Royal Statistical Society, 48: 167–227 y 52, pp. 241–301.

Recaño, J. y D. Andreu (2005) Factores sociodemográficos y territoriales de la inmigración irregular en España. Papers de demografia. Nº. 268, 2005. Centro de Estudios Demográficos. Universidad Autónoma de Barcelona.

Rotte, R. y M. Vogler (1998) “Determinants of international migration: empirical evidence for migration from developing countries to Germany”. CEPR Discussion Paper No. 1920.

Sjaastad, L.A. (1962). “The Cost and Return of Human Migration”. Journal of Political Economy, Vol.70, nº5, Supplement, pp. 80-93.

Sinn, H. W., G. Flaig, M. Werding, S. Munz, N. Duell y H. Hofmann (2001). EUErweiterung und Arbeitskräftemigration, Wege zu einer schrittweisen Annäherung der Arbeitsmärkte. Estudio IFO encargado por el Ministerio Alemán de trabajo.

Stark, O. (1991) The Migration of Labor. Basil Blackwell, Oxford, 1991.

Stark, O., y D. E. Bloom (1985). “The new economics of labor migration”. American Economic Review, 75(2), pp. 173–178.

Stark, O. y J. E. Taylor (1989).Relative Deprivation and International Migration. En Demography, 26, 1, pp. 1–14.

Stark, O. y J. E. Taylor (1991).”Migration Incentives, migration types: the role of relative deprivation”. The Economic Journal, 101, pp. 1163-1178.

Stark, O., y Y. Wang (2001). “Inducing Human Capital Formation: Migration as a Substitute for Subsidies”. Economics Series No. 100. Institute for Advanced Studies, Vienna.

Straubhaar, T. (1988). On the Economics of International Migration. Bernand Stuttgart, Verlag Paul Haupt.

Swamy, P.A.. and S.S. Arora (1972): The exact finite sample properties of the estimators of coefficients in the error component regression models. Econometrica 40, Pp: 261 – 275.

Taylor, J. E. (1986). Differential migration, networks, information and risk. En O. Stark (ed.), Research in Human Capital and Development, Vol. 4: Migration, Human Capital, and Development. JAI Press, Greenwich, CT.

Thomas, W. I. y F. Znaniecki (1918–1920) “The Polish Peasant”. En Europe and America. Boston: William Badger

Todaro, M. P. (1969). “A model of labor migration and urban unemployment in less developed countries”. *The American Economic Review*, Vol. 59, No. 1 (1969), pp. 138-148

Todaro, M. P. (1976): Internal Migration in Developing Countries. Ginebra: Oficina Internacional del Trabajo.

United Nations. Population Division. World Population Ageing 1950-2050. 2002.

Van der Gaag, N. y L. van Wissen (1999), “Analysis and forecasting of international migration by major groups (Part II)”, Working Paper, Eurostat, 3/1999/E/no.9.

Vinuesa Angulo, J. (2004). “Análisis del envejecimiento demográfico”. Encuentros Multidisciplinares, nº 16 VI, enero-abril-2004, pp. 30-37

Wallace, T.D. and A. Hussain (1969): The use of error components model in combining cross-section and time-series data. Econometrica 37. Pp: 55-72.

Wickramasekara, P. (2001): “Matching between Labour Demand and Supply; Need for Foreign Manpower in the European Labour Markets; Costs and Benefits of Migration for the Countries of Origin”. Presentation in Immigration: International and European Framework, Labour and Social Integration. 29 - 30 October 2001 – National Council for Economy and Labour (Cnel), Rome

Willekens, F., y N. Baydar (1986). Forecasting place-to-place migration with generalized linear models. In: R. Woods, and P. H. Rees (eds.), Population structures and models. Allen and Unwin, London, pp. 203–244.

Yang, P.Q. (1995). Post 1965 immigration to the United States: Structural Determinants. Praeger, Westport.

Zimmermann, K. F. (1995a). "European Migration: Push and Pull," Proceedings of the World Bank Annual Conference on Development Economics 1994, Supplement to The World Bank Economic Review and The World Bank Research Observer, 313-342.

Annex 1: Random effects coefficients obtained from the migration flows model

Country flor	RAMDOM EFFECTS (CROSS)		CRUCE PAÍSES	RAMDOM EFFECTS (CROSS)
TURKEOSTER—C	0.029242		EGYPTITALY--C	0.112534
ALGERBELGI—C	-0.049932		MOROCITALY--C	0.07671
MOROCBELGI—C	0.019515		TUNISITALY--C	0.005139
TUNISBELGI—C	-0.015777		TURKEITALY--C	-0.048482
TURKEBELGI—C	0.038483		ALGERNETHE--C	-0.154799
MOROCDENMA—C	-0.011711		EGYPTNETHE--C	-0.078917
TURKEDENMA—C	0.038315		MOROCNETHE--C	-0.017747
TURKEFINLA—C	0.026014		TUNISNETHE--C	-0.079098
ALGERFRANC—C	0.036854		TURKENETHE--C	0.002839
MOROCFRANC—C	-0.046964		ALGERSPAIN--C	-0.027658
TUNISFRANC—C	0.056304		EGYPTSPAIN--C	0.042736
TURKEFRANC—C	0.014765		MOROCSPAIN--C	-0.020222
EGYPTGERMA—C	-0.122555		TUNISSPAIN--C	0.020458
MOROCGERMA—C	0.021539		TURKESPAIN--C	-0.051012
TUNISGERMA—C	0.074845		TURKESWEDE--C	0.072294
TURKEGERMA—C	0.036289			

Annex 2: Dynamic panel data model for migratory flows of OECD countries

Dependent Variable: LOG(INMIG?)
Method: Pooled EGLS (Cross-section Random effects)
Sample (adjusted): 1996 2005
Included observations: 10 after adjustments
Cross-sections included: 493
Total pool (unbalanced) observations: 3034
Swamy and Arora estimator of component variances
White cross-section standard errors & covariance (d.f. corrected)
Cross sections without valid observations dropped

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.883664	0.356707	-2.477283	0.0133
LOG(GPULL?/GPUSH?)	0.204568	0.101742	2.010654	0.0444
LOG(DISTAN?^2)	-0.014467	0.011911	-1.214529	0.2246
LOG(EMPHOS?)	0.122302	0.032677	3.742786	0.0002
LANG?	0.227818	0.057289	3.976649	0.0001
LOG(INMIG?(-1))	0.901104	0.024202	37.23232	0.0000
LOG(GINHOS?/GINORI?)	-0.048901	0.087626	-0.558071	0.5768
@TREND()	0.046840	0.019259	2.432044	0.0151
@TREND()^2	-0.004837	0.001641	-2.947015	0.0032

Effects Specification	S.D.	Rho
Cross-section random	0.137391	0.0958
Idiosyncratic random	0.422195	0.9042

Weighted Statistics

R-squared	0.912722	Mean dependent var	-0.178685
Adjusted R-squared	0.912492	S.D. dependent var	1.656077
S.E. of regression	0.489898	Sum squared resid	725.9999
F-statistic	3954.312	Durbin-Watson stat	2.120702
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.939869	Mean dependent var	-0.163892
Sum squared resid	789.0552	Durbin-Watson stat	1.951232

Annex 3: Detailed migratory flows from MPCs towards the EU-15

Scenario 1: Median

From	To	2006	2007	2008	2009	2010	2015	2020	2025	2030	2035	2040	2045	2050
Turkey	Austria	7,762	7,779	7,690	7,532	7,313	6,626	5,530	4,621	3,914	3,229	2,678	2,230	1,898
Algeria	Belgium	712	700	684	671	659	583	542	514	505	494	463	418	394
Morocco	Belgium	6,423	5,827	5,212	4,643	4,118	3,453	2,779	2,339	1,949	1,577	1,234	915	691
Tunisia	Belgium	438	387	339	297	259	212	170	134	103	78	58	42	30
Turkey	Belgium	3,438	3,439	3,383	3,296	3,185	2,866	2,372	1,963	1,644	1,340	1,097	900	755
Turkey	Finland	357	376	389	400	409	402	374	358	355	351	354	366	393
Algeria	France	23,458	22,363	21,295	20,368	19,561	16,892	15,298	14,138	13,524	12,873	11,732	10,288	9,405
Morocco	France	19,347	18,644	17,634	16,511	15,317	13,335	11,070	9,551	8,117	6,663	5,269	3,930	2,974
Tunisia	France	7,043	6,237	5,484	4,809	4,206	3,440	2,738	2,141	1,637	1,225	892	634	444
Turkey	France	9,399	9,779	9,975	10,040	9,983	9,193	7,745	6,492	5,485	4,490	3,679	3,013	2,513
Egypt	Germany	1,328	1,173	1,000	828	668	500	365	258	170	79	25	5	0
Morocco	Germany	3,794	3,310	2,864	2,470	2,124	1,714	1,319	1,055	831	633	464	321	225
Tunisia	Germany	1,863	1,500	1,211	981	798	606	449	326	232	161	109	72	47
Turkey	Germany	34,346	32,519	30,495	28,398	26,277	22,510	17,639	13,749	10,801	8,220	6,259	4,764	3,692
Algeria	Netherlands	58	60	62	63	65	60	59	58	60	62	61	58	58
Egypt	Netherlands	351	329	296	258	219	175	137	106	76	39	14	3	0
Morocco	Netherlands	1,899	1,734	1,565	1,407	1,260	1,072	880	759	650	543	440	339	266
Tunisia	Netherlands	89	79	70	61	54	45	36	29	23	18	14	10	8
Turkey	Netherlands	3,191	3,229	3,219	3,178	3,112	2,852	2,415	2,052	1,773	1,494	1,269	1,083	947
Algeria	Spain	6,222	7,406	8,637	9,992	11,476	12,012	13,346	15,301	18,341	22,077	25,657	28,909	34,189
Morocco	Spain	77,306	85,062	90,842	95,554	99,126	98,397	94,803	96,475	98,130	97,704	94,858	87,835	83,334
Turkey	Spain	347	416	483	550	616	651	640	636	646	644	650	663	696
Turkey	Sweden	1,064	1,022	971	921	870	780	654	557	487	419	366	325	297

Scenario 2: Slow convergence

From	To	2006	2007	2008	2009	2010	2015	2020	2025	2030	2035	2040	2045	2050
Turkey	Austria	7,414	7,128	6,784	6,420	6,042	5,320	4,327	3,531	2,928	2,369	1,930	1,582	1,327
Algeria	Belgium	680	641	604	572	545	468	424	393	378	363	334	297	275
Morocco	Belgium	6,136	5,339	4,598	3,957	3,402	2,773	2,174	1,787	1,458	1,157	890	649	483
Tunisia	Belgium	419	355	299	253	214	171	133	102	77	57	42	30	21
Turkey	Belgium	3,284	3,151	2,984	2,810	2,631	2,301	1,856	1,500	1,230	983	790	638	527
Turkey	Finland	341	344	343	341	338	323	293	274	266	257	256	260	274
Algeria	France	22,407	20,491	18,787	17,361	16,160	13,563	11,970	10,805	10,117	9,444	8,457	7,298	6,575
Morocco	France	18,481	17,083	15,557	14,073	12,654	10,707	8,661	7,299	6,072	4,888	3,798	2,788	2,079
Tunisia	France	6,728	5,715	4,838	4,099	3,475	2,762	2,142	1,636	1,225	898	643	450	311
Turkey	France	8,978	8,960	8,800	8,557	8,247	7,382	6,060	4,962	4,103	3,295	2,652	2,137	1,757
Egypt	Germany	1,269	1,075	882	706	552	401	285	197	127	58	18	3	0
Morocco	Germany	3,624	3,033	2,527	2,106	1,755	1,376	1,032	806	622	464	335	228	158
Tunisia	Germany	1,780	1,374	1,068	836	659	487	351	249	173	118	78	51	33
Turkey	Germany	32,808	29,796	26,904	24,206	21,707	18,074	13,801	10,507	8,080	6,030	4,512	3,379	2,581
Algeria	Netherlands	56	55	55	54	54	48	46	45	45	46	44	41	41
Egypt	Netherlands	335	301	261	220	181	140	107	81	57	29	10	2	0
Morocco	Netherlands	1,814	1,589	1,380	1,199	1,041	861	689	580	486	398	317	240	186
Tunisia	Netherlands	85	72	61	52	45	36	28	22	17	13	10	7	5
Turkey	Netherlands	3,048	2,959	2,839	2,709	2,571	2,290	1,890	1,569	1,326	1,096	915	769	662
Algeria	Spain	5,943	6,786	7,620	8,517	9,481	9,644	10,442	11,694	13,720	16,197	18,494	20,506	23,900
Morocco	Spain	73,844	77,939	80,142	81,447	81,888	79,006	74,176	73,730	73,409	71,683	68,376	62,305	58,255
Turkey	Spain	332	381	426	469	509	522	501	486	483	472	469	470	486
Turkey	Sweden	1,017	936	857	785	719	627	512	426	364	307	264	230	207

Scenario 3: Fast convergence

From	To	2006	2007	2008	2009	2010	2015	2020	2025	2030	2035	2040	2045	2050
Turkey	Austria	7,044	6,464	5,897	5,370	4,880	4,163	3,289	2,615	2,117	1,676	1,339	1,077	889
Algeria	Belgium	646	581	525	478	440	367	322	291	273	257	232	202	185
Morocco	Belgium	5,829	4,842	3,997	3,310	2,748	2,169	1,653	1,323	1,054	818	617	442	324
Tunisia	Belgium	398	322	260	212	173	133	101	76	56	41	29	20	14
Turkey	Belgium	3,120	2,858	2,594	2,350	2,125	1,800	1,411	1,111	889	695	548	435	354
Turkey	Finland	324	312	298	285	273	252	223	203	192	182	177	177	184
Algeria	France	21,289	18,582	16,331	14,522	13,052	10,612	9,098	8,000	7,314	6,681	5,865	4,971	4,406
Morocco	France	17,558	15,492	13,523	11,772	10,220	8,377	6,584	5,404	4,389	3,458	2,634	1,899	1,393
Tunisia	France	6,392	5,183	4,205	3,428	2,807	2,161	1,628	1,212	885	636	446	307	208
Turkey	France	8,530	8,126	7,649	7,158	6,661	5,775	4,606	3,673	2,966	2,330	1,839	1,456	1,177
Egypt	Germany	1,206	975	767	590	446	314	217	146	92	41	12	2	0
Morocco	Germany	3,443	2,750	2,197	1,761	1,417	1,077	785	597	450	328	232	155	106
Tunisia	Germany	1,691	1,246	929	700	532	381	267	184	125	84	54	35	22
Turkey	Germany	31,170	27,021	23,387	20,247	17,533	14,142	10,490	7,780	5,841	4,266	3,129	2,302	1,730
Algeria	Netherlands	53	50	47	45	43	38	35	33	33	32	31	28	27
Egypt	Netherlands	318	273	227	184	146	110	82	60	41	20	7	1	0
Morocco	Netherlands	1,724	1,441	1,200	1,003	841	674	523	429	352	282	220	164	125
Tunisia	Netherlands	81	66	53	44	36	28	22	17	13	9	7	5	4
Turkey	Netherlands	2,896	2,683	2,468	2,266	2,077	1,792	1,436	1,161	959	775	634	524	444
Algeria	Spain	5,647	6,154	6,624	7,124	7,658	7,546	7,937	8,658	9,918	11,457	12,826	13,969	16,017
Morocco	Spain	70,158	70,679	69,666	68,127	66,141	61,816	56,383	54,590	53,068	50,706	47,421	42,441	39,040
Turkey	Spain	315	346	371	392	411	409	380	360	349	334	325	320	326
Turkey	Sweden	966	849	745	656	581	490	389	315	263	217	183	157	139

Scenario 4: Social Policy Measures

From	To	2006	2007	2008	2009	2010	2015	2020	2025	2030	2035	2040	2045	2050
Turkey	Austria	7,165	6,677	6,179	5,698	5,239	4,517	3,603	2,889	2,358	1,880	1,512	1,224	1,016
Algeria	Belgium	658	601	550	508	472	398	353	321	304	288	262	230	211
Morocco	Belgium	5,930	5,002	4,188	3,513	2,950	2,354	1,811	1,462	1,174	918	697	503	370
Tunisia	Belgium	405	332	273	225	186	145	111	84	62	46	33	23	16
Turkey	Belgium	3,174	2,952	2,718	2,494	2,281	1,954	1,545	1,227	990	780	619	494	404
Turkey	Finland	330	322	312	302	293	274	244	224	214	204	200	201	210
Algeria	France	21,654	19,196	17,110	15,411	14,013	11,515	9,967	8,841	8,147	7,496	6,624	5,648	5,033
Morocco	France	17,860	16,004	14,168	12,492	10,973	9,090	7,213	5,973	4,890	3,880	2,975	2,158	1,592
Tunisia	France	6,502	5,354	4,406	3,638	3,013	2,345	1,784	1,339	986	713	504	348	238
Turkey	France	8,676	8,395	8,014	7,596	7,152	6,267	5,046	4,060	3,304	2,615	2,077	1,654	1,345
Egypt	Germany	1,226	1,007	803	627	478	341	238	162	102	46	14	2	0
Morocco	Germany	3,503	2,841	2,301	1,869	1,522	1,168	859	660	501	369	262	176	121
Tunisia	Germany	1,720	1,287	973	742	572	413	292	204	140	94	61	39	25
Turkey	Germany	31,706	27,914	24,502	21,486	18,824	15,344	11,492	8,598	6,507	4,786	3,534	2,615	1,976
Algeria	Netherlands	54	52	50	48	47	41	38	36	36	36	35	32	31
Egypt	Netherlands	324	282	238	196	157	119	89	66	46	23	8	2	0
Morocco	Netherlands	1,753	1,488	1,257	1,064	903	731	573	474	392	316	248	186	143
Tunisia	Netherlands	82	68	56	46	39	30	24	18	14	11	8	6	4
Turkey	Netherlands	2,946	2,772	2,586	2,405	2,229	1,944	1,573	1,283	1,068	870	716	595	507
Algeria	Spain	5,744	6,357	6,940	7,560	8,221	8,188	8,696	9,568	11,049	12,856	14,487	15,871	18,297
Morocco	Spain	71,363	73,016	72,989	72,297	71,011	67,073	61,769	60,330	59,116	56,895	53,560	48,222	44,599
Turkey	Spain	321	357	388	416	441	444	417	398	389	375	367	364	372
Turkey	Sweden	982	877	780	696	623	532	426	348	293	244	207	178	159

Scenario 5: Slow Employment Growth

From	To	2006	2007	2008	2009	2010	2015	2020	2025	2030	2035	2040	2045	2050
Turkey	Austria	7,261	6,851	6,414	5,981	5,556	4,850	3,931	3,199	2,643	2,135	1,737	1,421	1,189
Algeria	Belgium	698	672	646	623	603	532	490	460	446	431	401	360	337
Morocco	Belgium	6,184	5,423	4,707	4,082	3,537	2,913	2,313	1,913	1,569	1,253	971	717	538
Tunisia	Belgium	429	372	321	276	238	194	154	120	92	70	51	37	26
Turkey	Belgium	3,216	3,029	2,821	2,617	2,419	2,098	1,686	1,359	1,110	886	711	574	473
Turkey	Finland	334	331	324	317	310	294	266	248	240	232	230	233	246
Algeria	France	22,973	21,485	20,098	18,911	17,887	15,391	13,822	12,644	11,934	11,217	10,142	8,860	8,036
Morocco	France	18,625	17,351	15,924	14,519	13,158	11,251	9,213	7,812	6,533	5,294	4,145	3,079	2,316
Tunisia	France	6,895	5,993	5,182	4,478	3,868	3,138	2,480	1,925	1,462	1,087	788	559	390
Turkey	France	8,792	8,613	8,319	7,972	7,584	6,730	5,506	4,494	3,704	2,969	2,386	1,920	1,574
Egypt	Germany	1,286	1,106	923	753	601	449	327	232	154	76	28	7	1
Morocco	Germany	3,653	3,080	2,587	2,172	1,825	1,446	1,098	863	669	503	365	252	176
Tunisia	Germany	1,824	1,441	1,144	914	734	553	406	293	207	143	96	63	41
Turkey	Germany	32,129	28,640	25,434	22,550	19,962	16,478	12,540	9,518	7,293	5,435	4,060	3,036	2,313
Algeria	Netherlands	57	58	58	59	59	55	53	52	53	54	53	50	50
Egypt	Netherlands	340	310	273	235	198	157	123	95	69	38	15	4	1
Morocco	Netherlands	1,828	1,613	1,413	1,237	1,082	905	732	620	523	431	346	265	207
Tunisia	Netherlands	87	76	66	57	50	41	33	26	21	16	12	9	7
Turkey	Netherlands	2,985	2,844	2,684	2,524	2,364	2,088	1,717	1,421	1,197	988	823	691	594
Algeria	Spain	6,093	7,115	8,152	9,277	10,494	10,944	12,058	13,684	16,184	19,237	22,179	24,896	29,213
Morocco	Spain	74,420	79,160	82,035	84,026	85,148	83,022	78,899	78,913	78,989	77,627	74,632	68,801	64,891
Turkey	Spain	325	367	403	437	468	476	455	440	436	426	422	423	436
Turkey	Sweden	996	900	810	731	661	571	465	386	329	277	238	207	186

Scenario 6: Fast Employment Growth

From	To	2006	2007	2008	2009	2010	2015	2020	2025	2030	2035	2040	2045	2050
Turkey	Austria	6,928	6,267	5,648	5,090	4,586	3,908	3,113	2,494	2,030	1,620	1,304	1,056	874
Algeria	Belgium	699	674	648	625	605	539	498	469	453	436	406	367	342
Morocco	Belgium	6,085	5,263	4,515	3,877	3,331	2,733	2,167	1,782	1,453	1,156	895	663	498
Tunisia	Belgium	429	373	322	278	241	197	157	123	95	72	53	38	27
Turkey	Belgium	3,068	2,771	2,485	2,228	1,997	1,690	1,335	1,059	853	672	534	426	348
Turkey	Finland	319	303	286	270	256	237	211	193	184	176	173	173	181
Algeria	France	23,007	21,538	20,162	18,977	17,951	15,603	14,070	12,887	12,127	11,363	10,280	9,018	8,173
Morocco	France	18,328	16,840	15,274	13,787	12,391	10,553	8,631	7,276	6,050	4,884	3,821	2,847	2,145
Tunisia	France	6,902	6,008	5,205	4,508	3,904	3,186	2,531	1,973	1,504	1,122	817	581	407
Turkey	France	8,389	7,878	7,326	6,785	6,261	5,422	4,360	3,504	2,845	2,254	1,792	1,427	1,158
Egypt	Germany	1,273	1,089	907	741	594	448	330	238	161	85	35	11	3
Morocco	Germany	3,594	2,989	2,481	2,063	1,718	1,356	1,029	804	620	464	337	233	163
Tunisia	Germany	1,826	1,445	1,149	920	741	562	415	300	213	147	100	66	43
Turkey	Germany	30,656	26,197	22,398	19,192	16,478	13,275	9,930	7,420	5,601	4,125	3,048	2,257	1,701
Algeria	Netherlands	57	58	59	59	60	56	54	53	54	55	54	51	51
Egypt	Netherlands	336	305	268	231	195	157	124	97	72	42	19	7	2
Morocco	Netherlands	1,799	1,566	1,355	1,175	1,019	849	686	578	485	398	319	245	192
Tunisia	Netherlands	88	76	66	57	50	41	34	27	21	17	13	9	7
Turkey	Netherlands	2,848	2,601	2,364	2,148	1,952	1,682	1,360	1,108	919	750	618	513	437
Algeria	Spain	6,102	7,133	8,177	9,310	10,532	11,095	12,275	13,947	16,447	19,488	22,482	25,339	29,710
Morocco	Spain	73,236	76,829	78,684	79,792	80,189	77,868	73,920	73,496	73,148	71,627	68,785	63,631	60,091
Turkey	Spain	310	335	355	372	386	384	360	343	335	323	317	314	320
Turkey	Sweden	950	823	713	622	546	460	368	301	252	210	178	154	137