# European Migration: Welfare Migration or Economic Migration?

Thierry Warin[*]        Pavel Svaton[†]

[*]Middlebury College, twarin@middlebury.edu

[†]The Brookings Institution, psvaton@brookings.edu

# European Migration: Welfare Migration or Economic Migration?[*]

Thierry Warin and Pavel Svaton

## Abstract

This paper presents an empirical assessment of bilateral migration flows into the EU-15 countries. Using an extended gravity model, it identifies economic, welfare state, geospatial and linguistic variables as the principal determinants of migration flows into the EU-15 countries. As long as its effect is not offset by a high unemployment rate in the host country, the level of social protection expenditure influences migrants' choice of destination. However, albeit acting as a joint force with other economic, cultural and geospatial variables, the welfare state characteristics of the host country need to be reckoned with when studying European migration flows. Our empirical findings lend some support for a more unified or at least better coordinated social policy across the European Union.

KEYWORDS: migration, welfare migration, economic migration, border effects

---

## 1. Introduction

The paper addresses the question of the determinants of migration flows towards 14 Western European countries that are part of the so-called EU-15. The current debate in Europe – and its shortcomings – focuses on what drives immigration: welfare programs or a positive outlook on the economic activity? In other words, are immigrants going to the Western countries looking for a safety net or are they ready to take risks? Previous studies characterized migration flows as a highly complex mechanism influenced by economic, geospatial and linguistic variables. However, the impact of the welfare state variables on the immigrant inflows remained mixed. Pedersen et al. (2004) found tax revenue as a percentage of GDP to be negatively correlated with the immigrant inflows. On the contrary, Leblang et al. (2007) show that per capita government consumption as a percentage of GDP is positively correlated with the immigrant inflows into 26 OECD countries.

Our study is conventional in the sense that it uses a gravity model as in the most recent studies, but differentiates itself (1) by looking explicitly at the immigration flows towards the 14 Western Europe members, (2) by considering pairs of the top 15 origin countries that send migrants to each host country out of the 14 Western Europe countries, and (3) by estimating the welfare state effects by choosing total social protection expenditure per capita in purchasing power parity standards instead of using broad measures such as total government expenditure or total government revenue as a percentage of GDP.

This question is of a paramount importance. The enlargement of the European Union (EU) has increased concerns about the role of generous welfare transfers in attracting migrants. What drives migration flows in the old EU member states? Do generous welfare state provisions in the EU-15 countries attract disproportionate numbers of migrants? To identify the push and pull factors of migration into the EU-15 countries is the main goal of this paper. From a Western European perspective, the fear of an only welfare-benefit based migration is that it would lead to a race to the bottom in terms of welfare policies. Such a race to the bottom would conflict with one of the great goals of the EU: convergence of living conditions and social standards.

The empirical analysis rests upon an extended gravity model usually used to study bilateral trade, investment or migration flows based on aggregate level data. Given the longitudinal nature of the dataset likely plagued by cross-panel heteroskedasticity and serial correlation within panels, we estimate our models by the Kmenta-Parks method.

We find that economic, welfare state, network, geospatial and linguistic effects all play a role in explaining migration flows into the EU-15 countries from the rest of the EU-15 countries, the Central and Eastern European countries (CEE-10), the Eastern European countries and the developing countries. The network

effects increase the immigration inflow and geographic distance decreases the immigration inflow into the EU-15 countries from all considered regions of origin. Social protection expenditure attracts migrants from the rest of the EU-15 countries, the Central and Eastern European countries and the developing countries. The closing income gap significantly decreases the immigrant inflows from the rest of the EU-15, the Central and Eastern European countries and the developing countries.

The breakdown of the causes of migration into its economic and welfare state components shows that both the economic and the welfare state effects play an important role in the migrants' choice of destination. The positive effect of social protection expenditure in the host country taken as a proxy for welfare state generosity partially offsets the negative effect of host country unemployment on the inflow of immigrants to the host country. Considering the interaction between social protection expenditure and the unemployment rate in the host country, we uncover that the negative effect of unemployment seems to override the positive impact of social protection on the immigrant inflows.

The paper is structured as follows. Section two provides an overview of the existing literature paying particular attention to the general welfare aspects of migration, the composition of the immigrant flow, the interaction between migration and the welfare state, and the European migration outlook. Section three presents the data sources and stylized facts. Section four explains the empirical procedure. Section five provides an interpretation of the results and section six draws some policy implications and conclusions.

## 2. Review of the Existing Literature

## 2.1 Economic Impacts of Migration

The cost-benefit analysis of international migration essentially focuses on how migrants perform in the host economy, what impact immigrants have on the employment opportunities of the natives, and what migration policy most benefits the host country (Borjas, 1994). The skill set of immigrants is crucial in this regard. Exerting production complementarities, if the stock of immigrants is sufficiently different from the native population, the impact of immigration on the host country population is likely to be positive (Borjas, 1995). Highly productive and easily adaptable immigrant workers are likely to benefit the host economy, whereas low skilled and less adaptable immigrants may rely disproportionately more on social assistance programs and impose a fiscal burden on the host economy (Borjas, 1994).

When fundamental theorems of welfare economics and free trade are applied to factor mobility between countries, general welfare should be increased

through migration (Borjas, 1995). In a closed economy model and in an open economy model where countries are already specialized according to their factor endowments, immigrants will lower the price of labor with which they are perfect substitutes and have an ambiguous effect on the price of labor with which they are complements. Immigration does not necessarily cause unemployment, but it does lead to movements of factors of production. If adjustment through wage is prevented in a closed economy due to labor market restrictions, unemployment will occur in place of reduced wages (Friedberg and Hunt, 1995).

With respect to the individual costs and returns of migration, direct money costs are associated with distance, labor market imperfections and information deficits faced by migrants; direct monetary returns are a result of nominal wage increases and of changes in the cost of employment and prices. Money returns can be enhanced through occupational upgrading and human capital formation (Sjaastad, 1962).

The main objective of the host country government is to minimize the fiscal burden imposed by the incoming migrants and maximize the benefits from immigration through optimal size and skill composition of the immigrant flow that can be ensured through a skills filter based immigration policy (Borjas, 1995).

## 2.2 Composition of the Immigrant Flow

The dilemma whether migrants impose a net benefit or a net loss on the host country can be partially resolved if the patterns of migrants' selection can be estimated. Chiswick (1999) uncovers a tendency towards a positive self-selection of migrants meaning that migrants are usually more entrepreneurial, more productive and more ambitious than the average member of the source country population. Chiswick (1999) further specifies that the positive self-selection bias increases with direct money costs of outward and return migration and with the relative skill-differential between source and host countries. He also acknowledges that non-economic migrants such as refugees, tied movers and ideological migrants are less likely to be positively self-selected than economic migrants. Borjas (1987) agrees with the proposition that immigrants do not constitute a random sample, but he adds that the quality of migrants is conditioned on relatively few economic and political characteristics of the country of origin. For a positive-selection bias to exist, a strong positive correlation between expected earnings in the host country $i$ and source country $j$ must be present, and the income distribution in the sending country must be less unequal than the income distribution in the destination country. Migrants from countries characterized by high levels of GDP per capita, low levels of income inequality

and politically competitive systems are likely to have better than average skills (Borjas, 1987).

Stark and Bloom (1985) and Stark and Taylor (1991) reveal that relative deprivation in the source region is an important explanatory variable of migration. A reference group characterized by a more unequal distribution of income is likely to be marked by more relative deprivation and a larger propensity to migrate among its members. An empirical study of Mexican households showed that more relatively deprived households are more likely to engage in international migration if absolute income is controlled for (Stark and Taylor, 1991).

## 2.3 Immigration and the Welfare State

Usher (1977) further analyzes the interaction between immigrants and the welfare state in the host country. A feature of most societies, and developed societies in particular, is the fact that a large proportion of property is publicly owned. In a simple theoretical model of progressive taxation, net wage equals actual wage minus tax payments plus the worker's share of public services financed through the tax system. In a progressive tax system that redistributes income, net wage is below the marginal product for high-skilled workers receiving high wages and exceeds the marginal product for unskilled workers getting lower wages. This simple proposition implies that low earning immigrants will free ride on the host country welfare system, and thus can be viewed as unwelcome in the host country.

As the number of migrants and in particular the number of low skilled migrants who are likely to be net-beneficiaries of the redistribution of income grows, more middle class natives who are hurt by the extra tax burden join the anti-high-income-tax coalition. The proposition that high inflows of immigrants will lead to a lower taxation burden is supported empirically in the study of eleven European countries from 1974 to 1992 that concludes that the tax burden on labor income decreases with the share of immigrants. A special caveat applies to educational attainment of immigrants. A larger share of immigrants with lower education results in a lower tax burden, whereas a larger share of immigrants with higher education is associated with higher tax rates (Razin et al., 1998).

There are a number of specific cases that help to resolve the cost and benefit equation of immigration. In the standard case, a wave of immigrants increases the labor force by $\Delta L$, which increases the national income by an amount that equals to the actual and indirect remuneration of immigrants (Usher, 1977).

Usher (1977) elaborates more specifically on the case of complementarities between domestic and immigrant labor presented by Borjas

(1995). Immigrants are likely to benefit the host country population if they have a unique factor of production, perform jobs that natives do not want to do or if they alleviate a shortage of labor in the host country. Moreover, given that migration redistributes income from labor to capital, additional immigration might be viewed undesirable if the distribution of income in the host country is already skewed towards capital.

While evaluating the costs and benefits of migration, economies of scale, externalities and the cost of education also play a role. If increasing returns to scale cause the wage to be less than the marginal product of labor, the additional worker exerts a benefit on the host country economy. Immigration of highly educated people is generally classified as bearing positive externalities because the net-contribution to society usually exceeds the monetary wage. In addition, if education is at least partially financed by the state and if an immigrant brings with him a stock of education virtually paid for by foreign tax-payers, the host economy will benefit from his education without paying for its cost (Usher, 1977). In the same vain, Friedberg and Hunt (1995) argue that the correlation between migration and economic growth depends on human capital levels of immigrants.

Borjas and Trejo (1991) reveal the common fear of politicians that low-skilled immigrants are likely to exploit the benefits of the generous welfare state in the developed nations and impose an undesired fiscal burden on the host population. The empirical analyses by Borjas and Trejo (1991), Borjas and Trejo (1993), and Borjas (1999) stand in a stark contrast to previous studies by Blau (1984) and Tienda and Jensen (1986). Both Blau's (1984) cross-sectional analysis based on the 1976 US Survey of Income and Education and Tienda and Jensen's (1986) study based on the 1980 US Census data find that immigrant families are less likely to participate in the welfare state system than corresponding native families.

Borjas and Trejo (1991) using the 1970 and 1990 US Censuses reach the following conclusions. Recent immigrant cohorts are more likely to participate in the welfare state system than earlier cohorts. The longer immigrant households reside in the United States, the more likely they are to receive welfare benefits. The post-war shift of the country of origin from Europe to Asia and Latin America has led to increased participation rates of immigrants in the welfare system. In a complementary study, Borjas and Trejo (1993) construct a model linking recipiency rates of immigrants to the characteristics of the source country. Immigrant welfare recipiency in the host country is negatively correlated with per capita GNP in the country of origin and the distance between the two countries. Refugee status raises welfare recipiency and immigrant welfare recipiency first rises and then falls with income inequality in the source country. Finally, Borjas (1999) tests the hypothesis that immigrant welfare recipients should be clustered

in US states with higher welfare benefits. The data drawn from the 1980 and 1990 US Censuses show that immigrant welfare recipients are more concentrated in states with generous welfare benefits than immigrants and natives who do not receive welfare.

An investigation of participation in means-tested entitlements programs in the United States by Borjas and Hilton (1996) reveals that 20.7 percent of immigrant households receive some type of welfare benefits as compared to 14.1 percent of native households. Recent immigrant households tend to have more spells on welfare than earlier cohorts, and these spells tend to be longer.

## 2.4 European Migration

Europe's stagnant population growth and aging population generate economic incentives for immigration. High unemployment relative to the United States and Japan leads to fears of lower social welfare and increasing social tensions. It is usual to think that high immigration will lead to lower wages and high unemployment rates. But in light of the model proposed by Friedberg and Hunt (1995), the economy will adjust to the inflow of immigrants through wage reductions if the labor market is flexible, or through higher unemployment if the labor market is dominated by stiff labor union contracts protecting the insiders. The coexistence of both high unemployment and declining wages seems dubious at best. Moreover, factor inputs of immigrants are likely to be complements to the domestic stock of labor and immigration has the potential to erode undesirable institutional constraints and make the labor market more flexible (Zimmerman, 1995).

Zimmerman (1995) also emphasizes that European policy makers have disproportionately focused on East-West migration and underestimated South-North migration that will be more challenging both in magnitude and in the composition of immigrants who will be less adaptable, less skilled and more likely to receive welfare. Kraus and Schwager (2000) further mitigate the fears of rising unemployment and the erosion of the Western European welfare state caused by East-West migration in the enlarged EU of twenty-seven countries. Prevailing differences between the West and the East in wages and welfare benefits will contribute to factor mobility and reduce migration costs, but macroeconomic convergence and increased trade intensity is likely to lead to a decline of migration from these countries. The southern enlargement including Spain, Portugal and Greece also did not cause any drastic increase in migration flows.

To perform in the highly competitive international markets, Zimmerman (1995) makes a case for selective migration of highly skilled individuals as

opposed to current practice whereby low skilled immigrants are attracted by industries threatened by cheap imports.

When assessing the impact of immigrants on the employment of natives, empirical studies have found little or no correlation between the unemployment rate of the natives and the share of the immigrant population. Winkelman and Zimmerman (1993) found significant but small effects of immigration on unemployment in the 1970s and Mühleisen and Zimmerman (1994) found no significant effects in the 1980s. In a more recent study, Gang et al. (2002) found little or no association between the presence of immigrants and unemployment among natives, with the exception of less educated native workers who suffered from higher unemployment rates but only in the presence of a substantial number of foreigners.

Using an extended gravity model based on aggregate data, Pedersen et al. (2004) present a comprehensive empirical study of migration flows into the 27 OECD countries during the 1990-2000 decade. They identify cultural and linguistic distance, network effects and former colonial and current business ties as being important explanatory variables of migration flows into the OECD countries. Higher income gaps were positively correlated with higher immigration inflows and depressed labor markets represented by higher unemployment rates were negatively correlated with immigration inflows. Tax revenue as a percentage of GDP was found to be negatively correlated with immigration inflows, which Pedersen et al. (2004) see as a counter-evidence of the welfare state magnets hypothesis. However, if we revisit Razin et al. (1998)'s analysis, we can argue that the negative sign of these variables is a consequence rather than a counter-evidence of the existence of welfare state magnets. Additionally using the European Community Household Panel (ECHP) dataset, De Giorgi and Pellizzari (2006) trace a negative effect of unemployment and a positive effect of welfare benefits on the immigration inflows into the pre-enlargement EU-15 countries during the 1994-2001 period. Studying the interaction effect between unemployment and welfare benefits in the host country, they estimate that changing benefits by 20 percent would almost completely offset the induced variations in migration flows caused by a significant, but not unreasonable, unemployment shock.

## 3. Data and Stylized Facts

### 3.1 Data Sources

A cross-sectional time-series pair-based dataset was created for 14 host countries of the European Union[1] and 76 origin countries during the period 1995-2004. The migration data, namely inflows of foreign population by nationality into the host country and stock of foreign population by nationality in the host country, is obtained from the OECD (2007). To differentiate ourselves from past studies, we compiled pairs constituted by each host country and the top 15 countries in terms of emigration to this host country. More specifically, for every host country out of the 14 members of EU-15, there are 15 pairs with this host country represented every time and 15 countries representing the countries that send more migrants to this particular host country than any other country. In theory, this would represent 210 pairs for 10 years, thus 2,100 observations per variable. However since for some small countries we cannot have access to the top 15 countries of migration origin, our panel is unbalanced. Hence we ended up with 185 pairs for the period 1995-2004, covering 76 different origin countries.

The variables describing the welfare state in the host countries and the old age dependency ratio come from Eurostat (European Commission, 2006a). The data on cost of labor in the host country is provided by Ameco (European Commission, 2006b). The unemployment figures describing the labor market situation in the host and origin countries are from the World Development Indicators database (World Bank, 2006). GDP per capita in the host and origin countries utilized to compute the GDP similarity index are obtained from the World Development Indicators database (World Bank, 2006) and the Penn World Table (Heston et al., 2006). The geospatial and cultural variables such as distance, contiguity, common language and colonial status were provided by the Cepii Distance Database (Cepii, 2006). For detailed description of all variables, please consult Appendix Table 1.

### 3.2 Stylized Facts

To illustrate the broad migration outlook in the investigated EU-15 countries, it is useful to examine the annual immigrant inflows as a percentage of total population and the annual immigrant stock as a percentage of total population over the period 1990-2004. The immigrant inflow rates fluctuated around 1 percent in Austria and Germany. Spain has experienced a recent increase in the immigrant inflows. With the exception of Luxembourg, the annual immigrant

---

[1] Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom

inflows in the remaining countries were generally below 1 percent of total population.

**Table 1: Annual immigrant inflows as % of total population**

|      | AUT | BEL | DNK | FIN | FRA | DEU | IRL | ITA | LUX | NLD | PTR | ESP | SWE | UK  |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1990 | 1.6 | 0.5 | 0.3 | 0.1 | 0.2 | 1.1 | -   | -   | 2.5 | 0.5 | -   | -   | 0.6 | 0.1 |
| 1991 | 1.6 | 0.6 | 0.3 | 0.2 | 0.2 | 1.2 | -   | -   | 2.6 | 0.6 | -   | -   | 0.5 | 0.1 |
| 1992 | 1.4 | 0.5 | 0.3 | 0.2 | 0.2 | 1.5 | -   | -   | 2.5 | 0.5 | -   | -   | 0.5 | 0.1 |
| 1993 | 1.0 | 0.6 | 0.3 | 0.2 | 0.2 | 1.2 | -   | -   | 2.3 | 0.6 | -   | -   | 0.6 | 0.1 |
| 1994 | 0.9 | 0.5 | 0.3 | 0.1 | 0.1 | 1.0 | -   | -   | 2.3 | 0.4 | -   | -   | 0.9 | 0.1 |
| 1995 | 1.1 | 0.5 | 0.6 | 0.1 | 0.1 | 1.0 | 0.4 | -   | 2.4 | 0.4 | 0.0 | -   | 0.4 | 0.1 |
| 1996 | 1.2 | 0.5 | 0.5 | 0.1 | 0.1 | 0.9 | 0.6 | -   | 2.2 | 0.5 | 0.0 | -   | 0.3 | 0.3 |
| 1997 | -   | 0.5 | 0.4 | 0.2 | 0.1 | 0.7 | 0.6 | -   | 2.3 | 0.5 | 0.0 | -   | 0.4 | 0.3 |
| 1998 | 0.7 | 0.5 | 0.4 | 0.2 | 0.2 | 0.7 | 0.6 | 0.2 | 2.5 | 0.5 | 0.1 | 0.1 | 0.4 | 0.4 |
| 1999 | 0.9 | 0.6 | 0.4 | 0.2 | 0.1 | 0.8 | 0.6 | 0.5 | 2.7 | 0.5 | 0.1 | 0.2 | 0.4 | 0.4 |
| 2000 | 0.8 | 0.6 | 0.4 | 0.2 | 0.2 | 0.8 | 0.7 | 0.5 | 2.5 | 0.6 | 0.2 | 0.8 | 0.5 | 0.4 |
| 2001 | 0.9 | 0.6 | 0.5 | 0.2 | 0.2 | 0.8 | 0.8 | 0.4 | 2.5 | 0.6 | 1.4 | 1.0 | 0.5 | 0.5 |
| 2002 | 1.1 | 0.7 | 0.4 | 0.2 | 0.2 | 0.8 | 1.0 | 0.7 | 2.5 | 0.5 | 0.6 | 1.1 | 0.5 | -   |
| 2003 | 1.2 | 0.7 | 0.3 | 0.2 | 0.2 | 0.7 | 0.8 | -   | 2.5 | 0.5 | 0.2 | 1.0 | 0.5 | -   |
| 2004 | 1.3 | 0.7 | 0.3 | 0.2 | 0.2 | 0.7 | 0.8 | 0.6 | 2.5 | 0.4 | 0.1 | 1.5 | 0.5 | -   |

*Source: International Migration Outlook, OECD.StatExtracts*

Depicting the annual immigrant stock as a percentage of total population, Table 2 hints at more heterogeneity among the EU-15 countries when it comes to immigrant residents in the host countries. Fluctuating around 9 percent of their total population, Austria, Belgium and Germany have the largest stock of foreign population. Followed by the Netherlands with a little more than 4 percent of total population, Sweden and Denmark as well as France, for which there are only two data points available, have the proportion of their foreign population stabilized at around 5 percent of total population. The stock of foreign population in the UK and Ireland has increased from around 3 percent in 1990 to around 5 percent in 2004. Italy, Spain and Portugal had a negligible stock of foreign population close to 1 percent of total population in 1990 but have experienced a massive influx of immigrants over the past 15 years, resulting in a stock of foreign population that reaches or exceeds 4 percent of total population in 2004. The only EU-15 country that does not seem to be affected as much by immigration is Finland where the stock of immigrants had barely exceeded 2 percent of total population in 2004.

**Table 2: Annual immigrant stock as % of total population**

|      | AUT | BEL | DNK | FIN | FRA | DEU | IRL | ITA | LUX | NLD | PTR | ESP | SWE | UK |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1990 | 5.9 | 9.1 | 3.1 | 0.5 | 6.3 | 6.7 | 2.3 | 1.4 | 30.0 | 4.6 | 1.1 | 0.7 | 5.7 | 3.0 |
| 1991 | 6.8 | 9.2 | 3.3 | 0.8 | -   | 7.4 | 2.5 | 1.5 | 30.8 | 4.9 | 1.1 | 0.9 | 5.7 | 3.1 |
| 1992 | 7.9 | 9.1 | 3.5 | 0.9 | -   | 8.1 | 2.7 | 1.6 | 31.7 | 5.0 | 1.2 | 1.0 | 5.8 | 3.5 |
| 1993 | 8.7 | 9.1 | 3.6 | 1.1 | -   | 8.5 | 2.5 | 1.7 | 32.5 | 5.1 | 1.3 | 1.1 | 5.8 | 3.5 |
| 1994 | 8.9 | 9.1 | 3.8 | 1.2 | -   | 8.6 | 2.5 | 1.6 | 33.2 | 4.9 | 1.6 | 1.2 | 6.1 | 3.4 |
| 1995 | 8.4 | 9.0 | 4.3 | 1.3 | -   | 8.8 | 2.7 | 1.3 | 34.1 | 4.7 | 1.7 | 1.3 | 6.0 | 3.4 |
| 1996 | 8.4 | 9.0 | 4.5 | 1.4 | -   | 8.9 | 3.2 | 1.7 | 34.8 | 4.4 | 1.7 | 1.3 | 6.0 | 3.3 |
| 1997 | 8.4 | 8.8 | 4.7 | 1.6 | -   | 9.0 | -   | 1.8 | 35.4 | 4.3 | 1.7 | 1.5 | 5.9 | 3.6 |
| 1998 | 8.5 | 8.7 | 4.8 | 1.7 | -   | 8.9 | -   | 1.9 | 36.1 | 4.2 | 1.8 | 1.8 | 5.6 | 3.8 |
| 1999 | 8.6 | 8.7 | 4.9 | 1.7 | 5.5 | 8.9 | -   | 2.3 | 37.1 | 4.1 | 1.9 | 2.0 | 5.5 | 3.8 |
| 2000 | 8.7 | 8.4 | 4.8 | 1.8 | -   | 8.9 | -   | 2.4 | 37.8 | 4.2 | 2.0 | 2.2 | 5.4 | 4.0 |
| 2001 | 8.9 | 8.2 | 5.0 | 1.9 | -   | 8.9 | -   | 2.5 | 37.8 | 4.3 | 3.4 | 2.7 | 5.3 | 4.4 |
| 2002 | 9.1 | 8.2 | 4.9 | 2.0 | -   | 8.9 | 5.6 | 2.6 | 38.2 | 4.4 | 4.0 | 3.2 | 5.3 | 4.4 |
| 2003 | 9.3 | 8.3 | 5.0 | 2.0 | -   | 8.9 | -   | 3.8 | 38.4 | 4.3 | 4.2 | 3.9 | 5.1 | 4.6 |
| 2004 | 9.5 | 8.4 | 4.9 | 2.1 | -   | 8.2 | -   | -   | 38.6 | 4.3 | 4.3 | 4.6 | 5.1 | 4.8 |

*Source: International Migration Outlook, OECD.StatExtracts*

Taking the bilateral immigrant inflows as a percentage of host country population as the dependent variable, a simple decomposition of variance into host country-specific fixed effects and time-specific effects provides us with an approximate indication of whether the spatial factor along the host country dimension is more important than the time effect factor. Table 3 shows the results of this simple variance decomposition. The host country-specific fixed effects explain 19.5 to 29.3 percent of variation in the dependent variable, in the samples encompassing countries of origin from the whole world, the new EU member states, Eastern Europe and the developing world. The host country-specific fixed effects explain 76.9 percent of the variation in the dependent variable in the EU-15 sample.

The time-specific fixed effects exposed in Table 4 do not explain nearly as much variation in the dependent variable as the host country-specific fixed effects do. The amount of variation in the dependent variable explained by time-specific fixed effects is less than 9 percent in all considered samples. This simple decomposition of variance shows that host country specific fixed effects are an important determinant of bilateral migration flows, whereas the time specific fixed effects do not appear to be nearly as important. The summary statistics of all quantitative variables grouped in five samples by the country of origin are displayed in Table 5.

**Table 3. Country-Specific Fixed Effects**

Dependent Variable: Immigrant inflow as a percentage of host country population

|  | World | EU-15 | CEE | EE | Dev.World |
|---|---|---|---|---|---|
| Belgium | -0.0202*** | -0.0272*** | -0.0167** | 0.0000 | -0.0754*** |
|  | [0.0037] | [0.0054] | [0.0076] | [0.0000] | [0.0101] |
| Denmark | -0.0339*** | -0.0484*** | -0.0215*** | -0.0507*** | -0.0814*** |
|  | [0.0037] | [0.0059] | [0.0079] | [0.0154] | [0.0100] |
| Finland | -0.0405*** | -0.0583*** | -0.0110 | -0.0414*** | -0.0935*** |
|  | [0.0036] | [0.0059] | [0.0096] | [0.0096] | [0.0100] |
| France | -0.0414*** | 0.0000 | -0.0270*** | -0.0548*** | -0.0892*** |
|  | [0.0036] | [0.0000] | [0.0096] | [0.0107] | [0.0098] |
| Germany | -0.0170*** | -0.0398*** | 0.0051 | -0.0293*** | -0.0307** |
|  | [0.0036] | [0.0059] | [0.0058] | [0.0086] | [0.0123] |
| Ireland | 0.0884*** | 0.1373*** | 0.0000 | 0.0000 | 0.0000 |
|  | [0.0068] | [0.0076] | [0.0000] | [0.0000] | [0.0000] |
| Italy | -0.0295*** | 0.0000 | 0.0049 | -0.0371*** | -0.0829*** |
|  | [0.0041] | [0.0000] | [0.0090] | [0.0099] | [0.0103] |
| Netherlands | -0.0310*** | -0.0482*** | -0.0181* | 0.0000 | -0.0769*** |
|  | [0.0037] | [0.0055] | [0.0101] | [0.0000] | [0.0102] |
| Portugal | -0.0281*** | -0.0598*** | 0.0022 | 0.0476*** | -0.0772*** |
|  | [0.0037] | [0.0055] | [0.0143] | [0.0146] | [0.0100] |
| Spain | -0.0089** | -0.0290*** | 0.0226*** | -0.0405*** | -0.0577*** |
|  | [0.0039] | [0.0069] | [0.0085] | [0.0154] | [0.0099] |
| Sweden | -0.0311*** | -0.0450*** | -0.0182* | -0.0464*** | -0.0788*** |
|  | [0.0036] | [0.0057] | [0.0096] | [0.0134] | [0.0099] |
| UK | -0.0327*** | -0.0473*** | 0.0000 | 0.0000 | -0.0858*** |
|  | [0.0039] | [0.0063] | [0.0000] | [0.0000] | [0.0101] |
| Constant (Austria) | 0.0485*** | 0.0655*** | 0.0289*** | 0.0570*** | 0.0978*** |
|  | [0.0029] | [0.0049] | [0.0042] | [0.0069] | [0.0095] |
| N | 1533 | 356 | 196 | 186 | 636 |
| F | 51.0772 | 114.8571 | 4.4849 | 9.1740 | 18.3932 |
| $R^2$ | 0.2874 | 0.7690 | 0.1951 | 0.2931 | 0.2448 |

Standard errors in brackets

* $p<0.10$  ** $p<0.05$  *** $p<0.01$

## Table 4: Time-Specific Fixed Effects

Dependent Variable: Immigrant inflow as a percentage of host country population

|  | World | EU-15 | CEE | EE | Dev.World |
|---|---|---|---|---|---|
| y1996 | 0.0003 | 0.0017 | -0.0037 | -0.0068 | 0.0003 |
|  | [0.0041] | [0.0094] | [0.0122] | [0.0181] | [0.0055] |
| y1997 | 0.0004 | 0.0017 | -0.0054 | -0.0099 | 0.0012 |
|  | [0.0041] | [0.0094] | [0.0122] | [0.0181] | [0.0055] |
| y1998 | 0.0007 | 0.0026 | -0.0045 | -0.0038 | 0.0016 |
|  | [0.0038] | [0.0092] | [0.0108] | [0.0158] | [0.0052] |
| y1999 | 0.0030 | 0.0032 | -0.0024 | 0.0059 | 0.0034 |
|  | [0.0038] | [0.0092] | [0.0107] | [0.0158] | [0.0051] |
| y2000 | 0.0059 | 0.0043 | 0.0000 | -0.0024 | 0.0115** |
|  | [0.0038] | [0.0092] | [0.0107] | [0.0157] | [0.0051] |
| y2001 | 0.0144*** | 0.0065 | 0.0065 | 0.0228 | 0.0200*** |
|  | [0.0038] | [0.0092] | [0.0107] | [0.0156] | [0.0051] |
| y2002 | 0.0122*** | 0.0053 | 0.0095 | 0.0080 | 0.0191*** |
|  | [0.0039] | [0.0094] | [0.0106] | [0.0156] | [0.0052] |
| y2003 | 0.0093** | 0.0058 | 0.0072 | 0.0001 | 0.0159*** |
|  | [0.0039] | [0.0094] | [0.0108] | [0.0161] | [0.0053] |
| y2004 | 0.0107*** | 0.0071 | 0.0222** | -0.0006 | 0.0135*** |
|  | [0.0039] | [0.0094] | [0.0106] | [0.0155] | [0.0052] |
| Constant (y1995) | 0.0166*** | 0.0234*** | 0.0208** | 0.0248* | 0.0100** |
|  | [0.0029] | [0.0068] | [0.0088] | [0.0128] | [0.0040] |
| N | 1533 | 356 | 196 | 186 | 636 |
| F | 4.5888 | 0.1304 | 1.8209 | 0.9119 | 5.3952 |
| $R^2$ | 0.0264 | 0.0034 | 0.0810 | 0.0446 | 0.0720 |

Standard errors in brackets

* $p<0.10$  **$p<0.05$  ***$p<0.01$

## Table 5: Summary Statistics Grouped by Country of Origin

| World | N | Mean | Median | S.D. | Max | Min |
|---|---|---|---|---|---|---|
| inflow of immigrant population | 1,533 | 0.023 | 0.013 | 0.032 | 0.443 | 0.000 |
| stock of immigrant population | 1,385 | 0.221 | 0.108 | 0.351 | 2.575 | 0.000 |
| total social protection expenditure | 1,778 | 5,653 | 5,827 | 1,414 | 8,437 | 2,229 |
| social expenditure: old age | 1,778 | 4,501 | 4,596 | 1,084 | 6,771 | 1,850 |
| social expenditure: family | 1,708 | 591 | 715 | 305 | 1,268 | 87 |
| social expenditure: labor market | 1,778 | 567 | 614 | 278 | 1,139 | 100 |
| GDP per capita similarity | 1,770 | -1.18 | -1.06 | 0.54 | -0.69 | -3.57 |
| host country unemployment rate | 1,764 | 8.2 | 8.0 | 3.8 | 22.7 | 2.7 |
| host country cost of labor | 1,778 | 100.4 | 100.2 | 2.4 | 114.0 | 93.2 |
| host country dependency ratio | 1,778 | 23.8 | 24.0 | 2.1 | 28.9 | 16.4 |
| origin country unemployment rate | 1,419 | 9.1 | 8.6 | 5.0 | 37.2 | 0.9 |
| geographical distance | 1,778 | 3,833 | 2,143 | 3,591 | 19,147 | 60 |

| EU-15 | N | Mean | Median | S.D. | Max | Min |
|---|---|---|---|---|---|---|
| inflow of immigrant population | 356 | 0.027 | 0.016 | 0.038 | 0.233 | 0.001 |
| stock of immigrant population | 351 | 0.315 | 0.158 | 0.405 | 2.575 | 0.019 |
| total social protection expenditure | 380 | 5,624 | 5,856 | 1,517 | 8,437 | 2,229 |
| social expenditure: old age | 380 | 4,426 | 4,512 | 1,163 | 6,771 | 1,850 |
| social expenditure: family | 350 | 582 | 603 | 294 | 1,268 | 87 |
| social expenditure: labor market | 380 | 626 | 693 | 269 | 1,139 | 127 |
| GDP per capita similarity | 380 | -0.72 | -0.70 | 0.12 | -0.69 | -1.65 |
| host country unemployment rate | 374 | 7.2 | 6.8 | 3.3 | 22.7 | 2.7 |
| host country cost of labor | 380 | 100.4 | 100.6 | 2.4 | 114.0 | 93.2 |
| host country dependency ratio | 380 | 23.3 | 23.3 | 2.4 | 27.4 | 16.4 |
| origin country unemployment rate | 367 | 8.9 | 8.9 | 3.4 | 22.7 | 2.7 |
| geographical distance | 380 | 1,117 | 864 | 1,108 | 6,714 | 173 |
| **New EU Members: CEE-10** | N | Mean | Median | S.D. | Max | Min |
| inflow of immigrant population | 196 | 0.025 | 0.014 | 0.030 | 0.210 | 0.001 |
| stock of immigrant population | 148 | 0.105 | 0.067 | 0.099 | 0.429 | 0.001 |
| total social protection expenditure | 240 | 5,914 | 6,004 | 1,292 | 8,437 | 2,229 |
| social expenditure: old age | 240 | 4,732 | 4,835 | 999 | 6,771 | 1,972 |
| social expenditure: family | 230 | 607 | 663 | 283 | 1,268 | 87 |
| social expenditure: labor market | 240 | 581 | 587 | 247 | 1,139 | 100 |
| GDP per capita similarity | 240 | -0.96 | -0.94 | 0.13 | -0.73 | -1.27 |
| host country unemployment rate | 239 | 7.8 | 7.8 | 3.8 | 22.7 | 2.7 |
| host country cost of labor | 240 | 100.3 | 100.0 | 2.1 | 106.7 | 93.2 |
| host country dependency ratio | 240 | 23.8 | 23.0 | 1.8 | 28.9 | 19.3 |
| origin country unemployment rate | 228 | 11.0 | 10.0 | 4.7 | 19.9 | 3.9 |
| geographical distance | 240 | 1,098 | 971 | 757 | 2,978 | 60 |
| **Eastern European Countries** | N | Mean | Median | S.D. | Max | Min |
| inflow of immigrant population | 186 | 0.028 | 0.015 | 0.042 | 0.443 | 0.000 |
| stock of immigrant population | 132 | 0.199 | 0.123 | 0.227 | 0.977 | 0.000 |
| total social protection expenditure | 238 | 5,684 | 5,784 | 1,279 | 8,437 | 2,229 |
| social expenditure: old age | 238 | 4,630 | 4,712 | 989 | 6,771 | 1,972 |
| social expenditure: family | 238 | 565 | 668 | 287 | 1,268 | 87 |
| social expenditure: labor market | 238 | 490 | 549 | 263 | 1,139 | 100 |
| GDP per capita similarity | 234 | -1.39 | -1.28 | 0.36 | -0.87 | -2.34 |
| host country unemployment rate | 238 | 8.6 | 8.9 | 3.3 | 22.7 | 3.6 |
| host country cost of labor | 238 | 100.6 | 100.0 | 2.4 | 106.7 | 93.2 |
| host country dependency ratio | 238 | 24.2 | 23.4 | 1.9 | 28.9 | 21.1 |
| origin country unemployment rate | 172 | 11.8 | 11.3 | 5.0 | 37.2 | 5.6 |
| geographical distance | 238 | 1,491 | 1,243 | 845 | 3,352 | 271 |
| **Developing Countries** | N | Mean | Median | S.D. | Max | Min |
| inflow of immigrant population | 636 | 0.019 | 0.010 | 0.029 | 0.259 | 0.000 |
| stock of immigrant population | 603 | 0.230 | 0.086 | 0.401 | 2.567 | 0.003 |
| total social protection expenditure | 740 | 5,496 | 5,707 | 1,486 | 8,437 | 2,229 |
| social expenditure: old age | 740 | 4,379 | 4,480 | 1,115 | 6,771 | 1,972 |
| social expenditure: family | 715 | 568 | 715 | 330 | 1,268 | 87 |
| social expenditure: labor market | 740 | 553 | 568 | 286 | 1,139 | 100 |
| GDP per capita similarity | 736 | -1.52 | -1.43 | 0.58 | -0.69 | -3.57 |
| host country unemployment rate | 735 | 8.9 | 8.8 | 4.1 | 22.7 | 2.7 |
| host country cost of labor | 740 | 100.4 | 100.5 | 2.3 | 106.7 | 93.2 |
| host country dependency ratio | 740 | 24.0 | 24.3 | 2.0 | 28.9 | 19.3 |
| origin country unemployment rate | 480 | 8.6 | 7.7 | 5.8 | 30.7 | 0.9 |
| geographical distance | 740 | 6,000 | 6,697 | 3,133 | 11,362 | 418 |

## 3.3 Estimation Procedure

Drawing on the discussion of econometric problems when analyzing a pair-based dataset compiled for gravity model purposes in Warin et al. (2008), possible presence of serial correlation and panel hetoroskedasticity might contradict the underlying assumptions of the pooled OLS estimation procedure. The Hausman test and the Breusch-Pagan test reject the option of poolability of our data. In addition, the Hausman test points in the direction of fixed effects with the inclusion of time dummies in most specifications. On rare occasions the Hausman test indicates the use of random effects, we nevertheless choose the fixed effects estimation framework to be consistent and to adhere to our assumption that country specific effects are important in our empirical model.

To test for first-order serial correlation, we employ the empirical test derived by Wooldridge (2002, pp. 282-283) and implemented by Drukker (2003). The Wooldridge test always rejects the null hypothesis of no first-order serial correlation in our panel at the 5 percent level of significance. To get at least approximate evidence of heteroskedasticity in our panel, we pool our data and perform the Breusch-Pagan/Cook-Weisberg test and the White's test. The Breusch-Pagan/Cook-Weisberg test always rejects the null hypothesis of homoskedasticity in our panel at the 5 percent level. The White's test accepts the null hypothesis of homoskedasticity only in a few cases.

As expected we are dealing with a cross-sectionally heteroskedastic and time-wise autoregressive model. To remedy these violations of the OLS assumptions, we undertake our estimation employing the Kmenta-Parks method that is able to account for heteroskedasticity and serial correlation when present as derived in Parks (1967) and Kmenta (1997).

Given the fact that micro-level data as used by Borjas (1999) and Borjas and Trejo (1991 and 1993) to study the welfare state magnets hypothesis in the United States is very scarce in the European context, we opted for an extended gravity model approach based on macro-level data, as previously employed by Vanderkamp (1977), Karemera et al. (2000), Pedersen et al. (2004), Biernbaum (2005) and Leblang et al. (2007). As compared to the micro-level data that conveys information about immigrant welfare recipiency that can be compared to welfare benefits received by the natives, the macro-level data enables us to only detect whether immigrants are attracted by welfare state provisions, but we are not able to distinguish whether immigrants do or do not take up these benefits after they have arrived in the host country.

As in Pedersen et al. (2004), our models follow a log-log specification, which is reasonable if we assume diminishing marginal returns. Moreover, since the decision to migrate is most likely based on the historical experience, we lag the explanatory variables characterizing the situation in the sending and receiving

countries by one time period. Our empirical models capture among other things the signaling effect of economic and welfare state variables in the host country.

## 4. Empirical Analysis

To differentiate between immigrant inflows coming from countries characterized by very different levels of socio-economic development, we first estimate our models in the entire sample and then divide the dataset into four sub-samples based on the country of origin. We analyze immigrant inflows originating in the EU-15 countries, the Central and Eastern European countries that have recently become members of the European Union, the Eastern European countries and the developing countries.

## 4.1 Total Social Protection Expenditure

Equation (1) specifies the baseline model where $INFLOW_{ij,t}$ is the annual immigrant inflows from the origin to the host country expressed as a percentage of total population of the host country, $STOCK_{ij,t-1}$ is the stock of the origin country population already resident in the host country also expressed as a percentage of total population of the host country, $SOC\_TOT_{i,t-1}$ denotes total social protection benefits per capita in the host country, $UE\_h_{i,t-1}$ captures the unemployment rate in the host country, and $SIM_{ij,t-1}{}^2$ approximates the similarity of per capita income between the host and the origin country.

$$INFLOW_{ij,t} = \alpha_s + \beta_1 STOCK_{ij,t-1} + \beta_2 SOC\_TOT_{i,t-1} + \beta_3 UE\_h_{i,t-1} + \beta_4 SIM_{ij,t-1}$$
$$+ \beta_5 AGE\_h_{i,t-1} + \beta_6 COST\_L\_h_{i,t-1} + \beta_7 UE\_o_{j,t-1} + \beta_8 DIST_{ij} + \beta_9 CONTIG_{ij} \qquad (1)$$
$$+ \beta_{10} COMLANG_{ij} + \beta_{11} COLONY_{ij} + \gamma + \varepsilon_{ij,t}$$

The smaller the income gap between two countries the greater the $SIM_{ij,t-1}$ measure is. $AGE\_h_{it-1}$ is the old age dependency ratio in the host country, $COST\_L\_h_{it-1}$ stands for real unit labor costs in the host economy, $UE\_o_{jt-1}$ measures unemployment in the origin country and $DIST_{ij}$ represents the distance between the country of origin and the country of destination. $CONTIG_{ij}$ $COMLANG_{ij}$ and $COLONY_{ij,}$ are a set of dummy variables taking the value of one if the sending and destination countries are contiguous, share a common official

---

$$^2 \; SIM_{ij,t} = \ln \left[ 1 - \left( \frac{Y_{it}}{Y_{it} + Y_{jt}} \right)^2 + \left( \frac{Y_{jt}}{Y_{it} + Y_{jt}} \right)^2 \right]$$

language, or were in a colonial relationship. $\gamma$ is a vector of year dummies included in the regression when appropriate.

Based on previous theoretical and empirical studies, we anticipate the following relationships to occur. Confirming the existence of network effects, the stock of the origin country population already resident in the host country should be positively correlated with the immigrant inflows. For the welfare state magnets hypothesis to hold, the proxies for welfare expenditure should be positively correlated with the immigrant inflows. Signaling that unfavorable conditions in the host country's labor market should decrease the influx of immigrants, the unemployment rate in the host country is expected to be negatively correlated with the dependent variable. The lower the income gap between the sending and destination country, the lower are the immigrant inflows. If the host country chooses to remedy its ageing population problem by attracting foreign labor, the higher the old-age dependency ratio in the host country, the higher are the immigrant inflows. The unemployment rate in the origin country is assumed to be positively correlated with the immigrant inflows to the host country. Distance is expected to diminish the immigrant inflows mainly because distance raises the direct costs of migration. It is reasonable to assume that the geospatial and cultural dummy variables contiguity, common language and colony will have a positive effect on the magnitude of the immigrant inflows.

Predicting migration flows from the top 15 countries out of the 76 origin countries to the 14 host countries, our baseline model supports most of the above assumptions (Table 6). Illustrated by a strong statistically significant positive correlation between the immigrant inflows and the stock of resident immigrants of the same nationality in the host country, network effects are an important determinant of migration flows from all four investigated regions of origin. Distance decreases the inflow of immigrants.

The level of total social protection expenditure in the host country plays a role in the decision to migrate for people from the rest of the EU-15, the Central and Eastern European countries and the developing world. A higher unemployment rate in the host country diminishes the number of immigrants from the rest of the EU-15 and the Central and Eastern European countries. Although the unemployment rate in the host country also bears a negative sign when the model is estimated in the sample of Eastern European and developing countries, it is not statistically significant. The host country old-age dependency ratio raises the immigrant inflows from developing countries indicating that countries with aging societies admit more immigrants in order to increase the proportion of the population in the working age. Interestingly, these immigrants tend to come from less developed parts of the world. The hypothesis that the decreasing-income differential between the host country *i* and origin country *j* should diminish the immigrant inflows holds for immigrants from the rest of the EU-15, the new EU

members (CEE-10) and the developing countries. The closing of the income gap between the destination and origin country in fact raises the migration potential from Eastern Europe. Besides the unemployment rate, the cost of labor in the host country seems to be the second most important characteristic of the situation in the host country labor market. Our model shows that the cost of labor in the host country does not send any signal to immigrants from the rest of the EU and from Eastern Europe. Whereas immigrants from the developing world gravitate towards countries with a higher cost of labor, immigrants from the Central and Eastern European countries tend to pick destinations with a lower cost of labor. This is likely due to the fact that countries with higher costs of labor are also countries with better welfare programs.

The single most important push factor that we included in our specifications, the unemployment rate in the origin country, is statistically significant for immigrants from the rest of the EU-15 and from developing countries. The negative sign in both of these samples might illustrate that a depressed labor market decreases people's income to such an extent that the fixed cost of migration cannot be breached.

A formal colonial relationship increases the immigrant inflows from the developing world and from the Central and Eastern European countries. The negative correlation between the immigrant inflows from the EU-15 countries and a former colonial status can be explained by the following conjecture. The Western European countries that have in the past been in a colonial-like relationship are likely to be considerably integrated within the Single Market where a free exchange of goods and services acts as a substitute for migration flows.

The positive correlation between language proximity and the inflow of immigrants is also not a surprise. The negative sign on the contiguity coefficient in the CEE-10 sample must be interpreted very cautiously. A careful look into the raw data uncovers that only four countries from Central and Eastern Europe, namely the Czech Republic, Hungary, Poland and Slovenia, are listed as contiguous with an old EU member. Furthermore, the contiguous host country is either Germany or Austria. A comparatively stricter immigration regime in these two host countries may explain the negative correlation.

**<u>Table 6: Total Social Protection Expenditure</u>**

Dependent variable: Immigrant inflow as a percentage of host country population

Log-log specification

| | World | EU-15 | CEE | EE | Dev.World |
|---|---|---|---|---|---|
| total social protection expenditure | 0.0319*** | 0.0068* | 0.0355*** | -0.0091 | 0.0730*** |
| | [0.0062] | [0.0037] | [0.0106] | [0.1190] | [0.0133] |
| host country unemployment rate | -0.0037*** | -0.0035*** | -0.0141*** | -0.0190 | -0.0007 |
| | [0.0013] | [0.0011] | [0.0045] | [0.0173] | [0.0037] |
| stock of immigrant population | 0.0411*** | 0.0399*** | 0.2202*** | 0.0622*** | 0.0602*** |
| | [0.0030] | [0.0044] | [0.0281] | [0.0175] | [0.0068] |
| host country dependency ratio | 0.0218** | -0.0132 | -0.0297 | 0.1335 | 0.0630** |
| | [0.0089] | [0.0112] | [0.0233] | [0.1082] | [0.0266] |
| host country cost of labor | -0.0067 | -0.0065 | -0.1346*** | 0.0469 | 0.0358** |
| | [0.0074] | [0.0081] | [0.0440] | [0.0731] | [0.0164] |
| GDP per capita similarity | 0.0020 | -0.0280** | -0.0979*** | 0.0602** | -0.0087* |
| | [0.0029] | [0.0131] | [0.0346] | [0.0261] | [0.0051] |
| origin country unemployment rate | 0.0004 | -0.0033*** | -0.0023 | 0.0038 | -0.0018* |
| | [0.0005] | [0.0009] | [0.0016] | [0.0095] | [0.0010] |
| geographical distance | -0.0005 | -0.0046*** | -0.0229*** | -0.0166** | -0.0016* |
| | [0.0004] | [0.0010] | [0.0074] | [0.0074] | [0.0009] |
| contiguity | 0.0080*** | 0.0014 | -0.0121*** | | -0.0010 |
| | [0.0022] | [0.0017] | [0.0045] | | [0.0031] |
| common language | 0.0006 | 0.0137*** | | | 0.0094*** |
| | [0.0035] | [0.0051] | | | [0.0025] |
| colony | 0.0085*** | -0.0213*** | 0.0418** | | 0.0090*** |
| | [0.0023] | [0.0056] | [0.0179] | | [0.0021] |
| constant | -0.2641*** | 0.0718 | 0.8463*** | -0.4505 | -0.9351*** |
| | [0.0753] | [0.0555] | [0.2216] | [1.1679] | [0.1829] |
| host country fixed effects | yes | yes | yes | yes | yes |
| year fixed effects | yes | yes | no | yes | yes |
| N | 928 | 301 | 118 | 73 | 322 |
| chi2 | 1.2e+03 | 787.5819 | 281.9179 | 102.2863 | 657.7880 |

Standard errors in brackets

* p<0.10  **p<0.05  ***p<0.01

## 4.2 Disaggregated Social Protection Expenditure

Another interesting question is to further disaggregate the social protection expenditure into more detailed categories. With this purpose in mind, we consider three main components of social protection expenditure in the host country: social protection expenditure related to old age, social protection expenditure related to family and social protection expenditure related to the labor market.[3]

---

[3] We assume that sickness and healthcare benefits, old age benefits, survivors benefits, and disability and invalidity benefits are disproportionately more used by older people and thus we include all of these in the group $OLD_{i,t-1}$. Family and children benefits and housing benefits are grouped together in the variable $FAMILY_{i,t-1}$. Unemployment benefits and social exclusion benefits are taken to smooth out fluctuations in the labor market and are collectively denoted as $LABOR_{i,t-1}$.

$$
\begin{aligned}
\mathrm{INFLOW}_{ij,t} = {} & \alpha_s + \beta_1 \mathrm{STOCK}_{ij,t\text{-}1} + \beta_2 \mathrm{OLD}_{i,t\text{-}1} + \beta_3 \mathrm{FAMILY}_{i,t\text{-}1} \\
& + \beta_4 \mathrm{LABOR}_{i,t\text{-}1} + \beta_5 \mathrm{UE\_h}_{i,t\text{-}1} + \beta_6 \mathrm{SIM}_{ij,t\text{-}1} + \beta_7 \mathrm{AGE\_h}_{i,t\text{-}1} + \beta_8 \mathrm{COST\_L\_h}_{i,t\text{-}1} \\
& + \beta_9 \mathrm{UE\_o}_{j,t\text{-}1} + \beta_{10} \mathrm{DIST}_{ij} + \beta_{11} \mathrm{CONTIG}_{ij} \\
& + \beta_{12} \mathrm{COMLANG}_{ij} + \beta_{13} \mathrm{COLONY}_{ij} + \gamma + \varepsilon_{it}
\end{aligned}
\qquad (2)
$$

Hence, equation (2) is identical to equation (1) with the exception that total social protection benefits $SOC\_TOT_{i,t\text{-}1}$ are disaggregated into more specific categories of social protection provided by the government.

Even though we believe that by grouping the social expenditure categories into the three aforementioned variables we have eliminated the risk of multi-collinearity[4], the variables are only significant in the EU-15 sample. More specifically, higher expenditure on families sends a negative signal to immigrants from the rest of the EU-15 countries, whereas a higher level of old-age related expenditure sends a positive signal to potential immigrants from the rest of the EU-15 countries (Table 7).

---

[4] The variance inflation factors (VIF) are lower than 3.

**Table 7: Disaggregated Social Protection Expenditure**

Dependent variable: Immigrant inflow as a percentage of host country population

Log-log specification

|  | World | EU-15 | CEE | EE | Dev.World |
|---|---|---|---|---|---|
| social expenditure: family | -0.0005 | -0.0076*** | 0.0084 | 0.0243 | 0.0020 |
|  | [0.0025] | [0.0020] | [0.0141] | [0.0246] | [0.0065] |
| social expenditure: old age | 0.0234*** | 0.0173*** | -0.0268 | -0.0658 | 0.0187 |
|  | [0.0071] | [0.0045] | [0.0598] | [0.1239] | [0.0116] |
| social expenditure: labor market | -0.0011 | 0.0033 | -0.0051 | -0.0303 | 0.0017 |
|  | [0.0026] | [0.0020] | [0.0189] | [0.0221] | [0.0062] |
| host country unemployment rate | -0.0015 | -0.0029** | -0.0075 | -0.0194 | -0.0011 |
|  | [0.0015] | [0.0014] | [0.0120] | [0.0173] | [0.0037] |
| stock of immigrant population | 0.0454*** | 0.0429*** | 0.2283*** | 0.0688*** | 0.0777*** |
|  | [0.0034] | [0.0036] | [0.0309] | [0.0160] | [0.0060] |
| host country dependency ratio | 0.0222* | -0.0037 | -0.0705 | 0.0970 | -0.0260 |
|  | [0.0122] | [0.0123] | [0.0678] | [0.1423] | [0.0202] |
| host country cost of labor | -0.0143* | -0.0080 | -0.0773 | 0.0646 | -0.0163 |
|  | [0.0085] | [0.0081] | [0.0670] | [0.0885] | [0.0165] |
| GDP per capita similarity | -0.0011 | -0.0314** | -0.1512*** | 0.0898*** | -0.0024 |
|  | [0.0029] | [0.0132] | [0.0493] | [0.0328] | [0.0049] |
| origin country unemployment rate | 0.0003 | -0.0026*** | -0.0020 | 0.0056 | -0.0013 |
|  | [0.0006] | [0.0008] | [0.0025] | [0.0077] | [0.0009] |
| geographical distance | -0.0010*** | -0.0044*** | -0.0357*** | -0.0215*** | -0.0005 |
|  | [0.0004] | [0.0007] | [0.0097] | [0.0081] | [0.0009] |
| contiguity | 0.0046** | 0.0026** | -0.0197** | 0.0234 | -0.0023 |
|  | [0.0020] | [0.0013] | [0.0080] | [0.0693] | [0.0035] |
| common language | -0.0007 | 0.0022 |  |  | 0.0135*** |
|  | [0.0033] | [0.0028] |  |  | [0.0021] |
| colony | 0.0100*** | -0.0124*** | 0.0106 |  | 0.0107*** |
|  | [0.0028] | [0.0037] | [0.0170] |  | [0.0020] |
| constant | -0.1387 | -0.0066 | 1.1205 | 0.0526 | 0.0000 |
|  | [0.0963] | [0.0625] | [0.7258] | [1.5210] | [0.0000] |
| host country fixed effects | yes | yes | yes | yes | yes |
| year fixed effects | yes | yes | yes | yes | yes |
| N | 865 | 271 | 109 | 73 | 303 |
| chi2 | 892.3903 | 1.3e+03 | 222.3462 | 110.2231 | 1.3e+07 |

Standard errors in brackets

* p<0.10 **p<0.05 ***p<0.01

## 4.3 Interaction between Host Country Unemployment and Social Protection Expenditure

The model including the interaction term between the host country unemployment rate and the level of social protection weighs the relative importance of these factors in the migrants' location decision. Is it the economic health of the host country or the level of its welfare state provisions? Or both?

$$
\begin{aligned}
\text{INFLOW}_{ij,t} = {} & \alpha_s + \beta_1 \text{STOCK}_{ij,t-1} + \beta_2 \text{SOC\_TOT}_{i,\,t-1} + \beta_3 \text{UE\_h}_{i,t-1} \\
& + \beta_4 \text{SOC\_TOT*UE\_h}_{i,t-1} + \beta_5 \text{SIM}_{ij,t-1} + \beta_6 \text{AGE\_h}_{i,t-1} \\
& + \beta_7 \text{COST\_L\_h}_{i,t-1} + \beta_8 \text{UE\_o}_{j,t-1} + \beta_9 \text{DIST}_{ij} + \beta_{10} \text{CONTIG}_{ij} \\
& + \beta_{11} \text{COMLANG}_{ij} + \beta_{12} \text{COLONY}_{ij} + \gamma + \varepsilon_{ij,t}
\end{aligned}
\tag{3}
$$

Hence, equation (3) is designed to capture the interaction effect between unemployment in the host country, which is a proxy for the labor market outlook in the host country, and the level of social protection provided by the government in the host country. The interaction term ($SOC\_TOT*UE\_h_{i,t-1}$) is added to the specification.

The unemployment rate and the interaction term are significant in all four samples by the region of origin, whereas the social protection expenditure is only significant when we consider immigrants from the new EU member states (Table 8). The total social protection variable and the unemployment rate variable have a negative sign, whereas the interaction term multiplying the unemployment rate by social protection expenditure has a positive sign. Indeed, if we consider the marginal effect of the unemployment rate, we find that social protection expenditure diminishes the marginal effect of the rate of unemployment on the migrants' decision of destination. Similarly, the marginal effect of social protection expenditure on the migrant's decision of destination is reduced if the unemployment rate increases. The offsetting effect between social protection expenditure and the unemployment rate in the host country is most apparent for migrants from the Central and Eastern European countries where all three variables (the unemployment rate, social protection expenditure and the interaction term) enter significantly in our model. However, even in the case of immigrant inflows from Central and Eastern European countries, the marginal effect of social protection expenditure is diminished by higher unemployment in the host country. In other words, if the coefficient of the social expenditure variable was positive and the coefficient of the interaction term was also positive, we would state that the marginal effect of social expenditure increases with higher unemployment. In such a scenario, social expenditure would be able to override the unfavorable labor market conditions to migrants. This is clearly not the case.

**Table 8: Interaction between Host Country Unemployment and Social Protection Expenditure**

Dependent variable: Immigrant inflow as a percentage of host country population

Log-log specification

|  | World | EU-15 | CEE | EE | Dev.World |
|---|---|---|---|---|---|
| total social protection expenditure | -0.0264*** | -0.0093 | -0.2198*** | -0.1406 | 0.0167 |
|  | [0.0102] | [0.0064] | [0.0423] | [0.1642] | [0.0190] |
| host country unemployment rate | -0.2161*** | -0.0551*** | -1.2156*** | -1.2089** | -0.1604** |
|  | [0.0363] | [0.0184] | [0.1900] | [0.6108] | [0.0690] |
| host country unemployment* | 0.0248*** | 0.0060*** | 0.1396*** | 0.1391* | 0.0185** |
| *social protection | [0.0042] | [0.0021] | [0.0219] | [0.0716] | [0.0079] |
| stock of immigrant population | 0.0449*** | 0.0376*** | 0.2193*** | 0.0634*** | 0.0649*** |
|  | [0.0026] | [0.0058] | [0.0244] | [0.0154] | [0.0057] |
| host country dependency ratio | -0.0097 | -0.0333*** | -0.1301*** | -0.1273 | 0.0208 |
|  | [0.0096] | [0.0117] | [0.0266] | [0.1515] | [0.0280] |
| host country cost of labor | 0.0013 | -0.0060 | -0.0334 | 0.0951 | 0.0378** |
|  | [0.0068] | [0.0071] | [0.0411] | [0.0702] | [0.0176] |
| GDP per capita similarity | -0.0010 | 0.0041 | -0.1040*** | 0.1001*** | -0.0001 |
|  | [0.0030] | [0.0222] | [0.0338] | [0.0317] | [0.0062] |
| origin country unemployment rate | 0.0002 | -0.0019* | -0.0011 | 0.0042 | -0.0023** |
|  | [0.0005] | [0.0010] | [0.0017] | [0.0083] | [0.0009] |
| geographical distance | -0.0013*** | -0.0043*** | -0.0254*** | -0.0258*** | -0.0016* |
|  | [0.0003] | [0.0013] | [0.0066] | [0.0078] | [0.0008] |
| contiguity | 0.0085*** | -0.0013 | -0.0135*** | -0.1129* | -0.0023 |
|  | [0.0016] | [0.0019] | [0.0037] | [0.0649] | [0.0029] |
| common language | -0.0002 | 0.0197*** |  |  | 0.0088*** |
|  | [0.0030] | [0.0055] |  |  | [0.0020] |
| colony | 0.0092*** | -0.0350*** | 0.0425*** |  | 0.0088*** |
|  | [0.0021] | [0.0091] | [0.0162] |  | [0.0020] |
| constant | 0.3105*** | 0.2645*** | 2.8325*** | 1.3861 | -0.3520 |
|  | [0.1135] | [0.0794] | [0.4041] | [1.6085] | [0.2423] |
| host country fixed effects | yes | yes | yes | yes | yes |
| year fixed effects | yes | yes | no | yes | yes |
| N | 928 | 301 | 118 | 73 | 322 |
| chi2 | 1.1e+03 | 524.0582 | 384.0807 | 123.1258 | 725.2037 |

Standard errors in brackets

\* p<0.10  \*\*p<0.05  \*\*\*p<0.01

To reinforce our analysis of the interaction between unemployment and social protection expenditure in the host country, we estimate two more specifications. Equation (4) includes the ratio $SOC\_TOT/UE\_h_{i,t-1,}$ which is supposed to capture the effect of increasing social protection expenditure per unit of unemployment in the host country on the immigrant inflows. Equation (5) contains the ratio $UE\_h/SOC\_TOT_{i,t-1}$ which gauges the effect of increasing unemployment per unit of social expenditure in the host country on the immigrant inflows.

$$INFLOW_{ij,t} = \alpha_s + \beta_1 STOCK_{ij,t-1} + \beta_2 SOC\_TOT_{i,t-1} + \beta_3 UE\_h_{i,t-1}$$
$$+ \beta_4 SOC\_TOT/UE\_h_{i,t-1} + \beta_5 SIM_{ij,t-1} + \beta_6 AGE\_h_{i,t-1}$$
$$+ \beta_7 COST\_L\_h_{i,t-1} + \beta_8 UE\_o_{j,t-1} + \beta_9 DIST_{ij} + \beta_{10} CONTIG_{ij}$$
$$+ \beta_{11} COMLANG_{ij} + \beta_{12} COLONY_{ij} + \gamma + \varepsilon_{ij,t} \qquad (4)$$

$$INFLOW_{ij,t} = \alpha_s + \beta_1 STOCK_{ij,t-1} + \beta_2 SOC\_TOT_{i,t-1} + \beta_3 UE\_h_{i,t-1}$$
$$+ \beta_4 UE\_h/SOC\_TOT_{i,t-1} + \beta_5 SIM_{ij,t-1} + \beta_6 AGE\_h_{i,t-1}$$
$$+ \beta_7 COST\_L\_h_{i,t-1} + \beta_8 UE\_o_{j,t-1} + \beta_9 DIST_{ij} + \beta_{10} CONTIG_{ij}$$
$$+ \beta_{11} COMLANG_{ij} + \beta_{12} COLONY_{ij} + \gamma + \varepsilon_{ij,t} \qquad (5)$$

The results in Table 9 show that an increase in social protection expenditure in the host country per unit of unemployment has the potential to attract migrants from the rest of the EU-15, from the new EU members and from Eastern Europe. The results in Table 10 provide evidence that a rise in the unemployment rate per unit of social protection expenditure will make the host country less attractive for migrants from the rest of the EU-15 and the Central and Eastern European countries. The absolute magnitude of the social expenditure over unemployment coefficient is much lower than the absolute magnitude of the unemployment over social protection coefficient. Hence, there exists an offsetting mechanism between the unemployment rate and social protection expenditure in the host country with respect to attracting immigrants, but the negative effect of the unemployment rate seems to be disproportionately more important than the positive effect of social protection expenditure in attracting migrants to the host country.

## Table 9: Social Protection Expenditure per Unit of Unemployment in the Host Country

Dependent variable: Immigrant inflow as a percentage of host country population

Log-log specification

| | World | EU-15 | CEE | EE | Dev.World |
|---|---|---|---|---|---|
| host country social protection | -0.0002 | 0.0004* | 0.0038** | 0.0174** | -0.0004 |
| expenditure per unit of unemployment | [0.0003] | [0.0002] | [0.0015] | [0.0089] | [0.0006] |
| stock of immigrant population | 0.0425*** | 0.0261*** | 0.2348*** | 0.0558*** | 0.0576*** |
| | [0.0032] | [0.0052] | [0.0219] | [0.0155] | [0.0086] |
| host country dependency ratio | 0.0323*** | -0.0089 | 0.0558*** | 0.2230* | 0.0313 |
| | [0.0086] | [0.0107] | [0.0133] | [0.1188] | [0.0309] |
| host country cost of labor | -0.0146** | -0.0072 | -0.0843** | 0.0291 | 0.0305 |
| | [0.0073] | [0.0066] | [0.0424] | [0.0671] | [0.0208] |
| GDP per capita similarity | 0.0022 | -0.0225 | -0.1022*** | 0.0468* | -0.0004 |
| | [0.0031] | [0.0193] | [0.0299] | [0.0265] | [0.0078] |
| origin country unemployment rate | 0.0008 | -0.0015 | -0.0008 | 0.0055 | -0.0022* |
| | [0.0006] | [0.0009] | [0.0015] | [0.0092] | [0.0012] |
| geographical distance | -0.0008* | -0.0049*** | -0.0242*** | -0.0135* | -0.0016 |
| | [0.0004] | [0.0014] | [0.0061] | [0.0076] | [0.0012] |
| contiguity | 0.0071*** | 0.0004 | -0.0128* | 0.0018 | -0.0009 |
| | [0.0021] | [0.0022] | [0.0065] | [0.0241] | [0.0033] |
| common language | -0.0001 | 0.0226*** | | | 0.0074** |
| | [0.0029] | [0.0057] | | | [0.0030] |
| colony | 0.0084*** | -0.0237*** | 0.0325*** | | 0.0089*** |
| | [0.0021] | [0.0057] | [0.0114] | | [0.0024] |
| constant | 0.0223 | 0.1352** | 0.5956*** | -0.8518 | -0.1831 |
| | [0.0505] | [0.0569] | [0.2147] | [0.6036] | [0.1697] |
| host country fixed effects | yes | yes | yes | yes | yes |
| year fixed effects | yes | yes | no | yes | yes |
| N | 928 | 301 | 118 | 73 | 322 |
| chi2 | 1.0e+03 | 721.5766 | 426.1931 | 113.0406 | 471.7534 |

Standard errors in brackets
* p<0.10  **p<0.05  ***p<0.01

**Table 10: Unemployment per Unit of Social Protection Expenditure in the Host Country**

Dependent variable: Immigrant inflow as a percentage of host country population

Log-log specification

| | World | EU-15 | CEE | EE | Dev.World |
|---|---|---|---|---|---|
| host country unemployment per unit of social protection expenditure | -0.0373*** [0.0119] | -0.0328*** [0.0088] | -0.1736** [0.0722] | -0.2199 [0.1509] | 0.0050 [0.0309] |
| stock of immigrant population | 0.0427*** [0.0036] | 0.0434*** [0.0051] | 0.1980*** [0.0342] | 0.0548*** [0.0167] | 0.0607*** [0.0073] |
| host country dependency ratio | 0.0374*** [0.0099] | -0.0109 [0.0105] | -0.0262 [0.0400] | 0.1438 [0.1067] | 0.0586** [0.0295] |
| host country cost of labor | -0.0078 [0.0079] | -0.0076 [0.0074] | -0.1381*** [0.0532] | 0.0447 [0.0730] | 0.0349* [0.0194] |
| GDP per capita similarity | 0.0045 [0.0030] | 0.0192 [0.0281] | -0.1682*** [0.0549] | 0.0374 [0.0262] | -0.0092 [0.0062] |
| origin country unemployment rate | 0.0006 [0.0006] | -0.0028*** [0.0010] | -0.0039 [0.0032] | 0.0065 [0.0096] | -0.0026** [0.0011] |
| geographical distance | -0.0007* [0.0004] | -0.0044*** [0.0010] | -0.0359*** [0.0109] | -0.0116 [0.0075] | -0.0018** [0.0009] |
| contiguity | 0.0063*** [0.0020] | 0.0010 [0.0016] | -0.0209* [0.0121] | | -0.0016 [0.0030] |
| common language | 0.0018 [0.0031] | 0.0129*** [0.0049] | | | 0.0102*** [0.0029] |
| colony | 0.0079*** [0.0023] | -0.0357*** [0.0086] | -0.0016 [0.0282] | | 0.0081*** [0.0024] |
| constant | -0.0271 [0.0556] | 0.0652 [0.0630] | 1.2773*** [0.3368] | -0.5410 [0.5841] | -0.2794* [0.1654] |
| host country fixed effects | yes | yes | yes | yes | yes |
| year fixed effects | yes | yes | yes | yes | yes |
| N | 928 | 301 | 118 | 73 | 322 |
| chi2 | 803.5111 | 771.3775 | 255.4846 | 93.4645 | 556.4026 |

Standard errors in brackets

* p<0.10  **p<0.05  ***p<0.01

## 5. Concluding Remarks and Policy Implications

The empirical analysis undertaken in this paper confirmed the empirical findings of previous articles that characterized migration flows as a highly complex mechanism. Using the gravity model methodology, the previous studies were usually successful at identifying the economic, geospatial and linguistic variables as the principal determinants of immigration flows. However, the impact of the welfare state variables on the immigrant inflows remained mixed. Pedersen et al. (2004) found tax revenue as a percentage of GDP to be negatively correlated with the immigrant inflows. On the contrary, Leblang et al. (2007) show that per capita government consumption as a percentage of GDP is positively correlated with the immigrant inflows into 26 OECD countries.

By using total social protection expenditure per capita in purchasing power parity standards instead of using broad measures such as total government expenditure or total government revenue as a percentage of GDP, we believe that

our study improved the estimation of the welfare state effect of the previous models.

The crucial finding that the level of social protection expenditure sends an important signal to potential immigrants lends considerable support for the welfare state magnets hypothesis in the European context. The demonstration that the economic and welfare state forces do not exist in isolation but on the contrary have joint effects adds another layer of complexity to the analysis of migration flows. It is reasonable to infer from our analysis that countries with a positive labor market outlook and with generous welfare state provisions will be the favorite destination for immigrants. Based on aggregate data analyzed in the framework of a gravity model, our results come surprisingly close to the results from the ECHP micro-level dataset of De Giorgi and Pellizzari (2006) who also find that the labor market outlook in the host country is comparatively more important than welfare provisions, although the positive signal of a generous welfare state is not trivial.

Based on this fact, a more unified or at least better coordinated social policy across the EU should be given some thought, especially at the time of designing a new system for attracting skilled migrants into the European Union. This coordinated social policy should aim at preventing the implicit penalization of countries with more generous welfare states that receive more immigrants. The "blue card" system has the potential to add much needed flexibility to the European labor market, but it can easily fall into dismay, as soon as the European taxpayer gets the feeling that it is she who is paying for it.

**Appendix Table 1: Definition of Variables**

| Variable | Explanation | Source |
|---|---|---|
| immigrant inflow as a percentage of host country population (INFLOW) | Inflow of foreign population into the host country as a percentage of host country population. | Organization for Economic Co-operation and Development (OECD). 2007. OECD.StatExtracts. Paris: OECD Publishing. |
| stock of immigrant population (STOCK) | Stock of foreign population by nationality in the host country as a percentage of host country population. | Organization for Economic Co-operation and Development (OECD). 2007. OECD.StatExtracts. Paris: OECD Publishing. |
| total social protection expenditure (SOC_TOT) | Social protection expenditure - all functions (PPS per capita) in the host country. | European Commission. 2006a. Eurostat. Vol. 2007. European Union: Luxembourg. |
| social expenditure: old age (OLD) | Sickness and healthcare benefits, old age benefits, survivors benefits, and disability and invalidity benefits (PPS per capita) in the host country. | European Commission. 2006a. Eurostat. Vol. 2007. European Union: Luxembourg. |
| social expenditure: family (FAMILY) | Family and children benefits and housing benefits (PPS per capita) in the host country. | European Commission. 2006a. Eurostat. Vol. 2007. European Union: Luxembourg. |
| social expenditure: labor market (LABOR) | Unemployment benefits and social exclusion benefits (PPS per capita) in the host country. | European Commission. 2006a. Eurostat. Vol. 2007. European Union: Luxembourg. |
| host country cost of labor (COST_L_h) | Real unit labor costs in the host country: total economy - Performance relative to the rest of 14 EU countries (Former EU-15 excluding LU): double export weights. | European Commission. 2006b. Ameco: European Macroeconomic Data. Vol. 2007. European Union: Luxembourg. |
| host country dependency ratio (AGE_h) | Old age dependency ratio in the host country. | European Commission. 2006b. Ameco: European Macroeconomic Data. Vol. 2007. European Union: Luxembourg. |
| host country unemployment rate (UE_h) | Unemployment rate in the host country, total (percent of total labor force). | World Bank. 2006. World Development Indicators. Vol. 2007. The World Bank: Washington. |
| GDP per capita similarity (SIM) | Similarity measure relating GDP per capita (PPS, constant 2000 international $) in host and origin countries. | World Bank. 2006. World Development Indicators. Vol. 2007. The World Bank: Washington. and Heston, Alan, Robert Summers, and Bettina Aten. 2006. "Penn World Table Version 6.2." Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania. |
| origin country unemployment rate (UE_o) | Unemployment rate in the origin country, total (percent of total labor force). | World Bank. 2006. World Development Indicators. Vol. 2007. The World Bank: Washington. |
| contiguity (CONTIG) | Dummy variable equals 1 if two countries are contiguous. | Centre D'Etudes Prospectives et D'Informations Internationales (CEPII). 2006. CEPII Distance Database. Paris: CEPII. |
| common language (COMLANG) | Dummy variable equals 1 if two countries share a common official language. | Centre D'Etudes Prospectives et D'Informations Internationales (CEPII). 2006. CEPII Distance Database. Paris: CEPII. |
| colony (COLONY) | Dummy variable equals 1 if two countries ever had a colonial link. | Centre D'Etudes Prospectives et D'Informations Internationales (CEPII). 2006. CEPII Distance Database. Paris: CEPII. |
| geographical distance (DIST) | Geodesic distance calculated by the great circle formula using latitude and longitude of the most important cities in terms of population. | Centre D'Etudes Prospectives et D'Informations Internationales (CEPII). 2006. CEPII Distance Database. Paris: CEPII. |

# References

Biernbaum, Lee. 2005. "Toward a Common Market in Residency: International Migration and Regional Integration."

Blau, Francine D. 1984. "The Use of Transfer Payments by Immigrants." *Industrial and Labor Relations Review*, 37(2): 222-39.

Borjas, George J. 1987. "Self-Selection and the Earnings of Immigrants." *American Economic Review*, 77(4): 531-53.

Borjas, George J., and Stephen J. Trejo. 1991. "Immigrant Participation in the Welfare System." *Industrial and Labor Relations Review*, 44(2): 195-211.

Borjas, George J., and Stephen J. Trejo. 1993. "National Origin and Immigrant Welfare Recipiency." *Journal of Public Economics*, 50(3): 325-44.

Borjas, George J. 1994. "The Economics of Immigration." *Journal of Economic Literature*, 32(4): 1667-1717.

Borjas, George J. 1995. "The Economic Benefits from Immigration." *Journal of Economic Perspectives*, 9(2): 3-22.

Borjas, George J., and Lynette Hilton. 1996. "Immigration and the Welfare State: Immigrant Participation in Means-Tested Entitlement Programs." *Quarterly Journal of Economics*, 111(2): 575-604.

Borjas, George J. 1999. "Immigration and Welfare Magnets." *Journal of Labor Economics*, 17(4): 607-37.

Centre D'Etudes Prospectives et D'Informations Internationales (CEPII). 2006. CEPII Distance Database. Paris: CEPII.

Chiswick, Barry R. 1999. "Are Immigrants Favorably Self-Selected?" *American Economic Review*, 89(2): 181-85.

De Giorgi, Giacomo, and Michele Pellizzari. 2006. "Welfare Migration in Europe and the Cost of Harmonised Social Assistance." IZA Discussion Paper No. 2094.

Drukker, David M. 2003. "Testing for serial correlation in linear panel-data models." *Stata Journal*, 3(2): 168–77.

Friedberg, Rachel, and Jennifer Hunt. 1995. "The Effects of Immigrants on Host Country Wages, Employment, and Growth." *Journal of Economic Perspectives*, 9(2): 23-44.

European Commission. 2006a. Eurostat. Vol. 2007. European Union: Luxembourg.

European Commission. 2006b. Ameco: European Macroeconomic Data. Vol. 2007. European Union: Luxembourg.

Gang, Ira N., Francisco L. Rivera-Batiz, and Myeong-Su Yun. 2002. "Immigrants and Unemployment in the European Community: From the Eyes of the Natives." Department of Economics at Rutgers University.

Heston, Alan, Robert Summers, and Bettina Aten. 2006. "Penn World Table Version 6.2." Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania.

Karemera, David, Victor I. Oguledo, and Bobby Davis. 2000. "A Gravity Model Analysis of International Migration to North America." *Applied Economics*, 32(13): 1745-55.

Kmenta, Jan. 1997. *Elements of Econometrics*. Michigan: University of Michigan Press.

Kraus, Margit, and Robert Schwager. 2000. "EU Enlargement and Immigration." Zentrum für Europäische Wirtschaftsforschung.

Leblang, David, Jennifer Fitzgerald, and Jessica Teets. 2007. "Defying the Law of Gravity: The Political Economy of International Migration." Department of Political Science, University of Colorado at Boulder.

Mühleisen, Martin, and Klaus F. Zimmermann. 1994. "A Panel Analysis of Job Changes and Unemployment." *European Economic Review*, 38(3): 793-801.

Organization for Economic Co-operation and Development (OECD). 2006. International Migration Outlook. Paris: OECD Publishing.

Organization for Economic Co-operation and Development (OECD). 2007. OECD.StatExtracts. Paris: OECD Publishing.

Parks, Richard W. 1967. "Efficient Estimation of a System of Equations When Disturbances are Both Serially and Contemporaneously Correlated." *Journal of the American Statistical Association*, 62(318): 500-09.

Pedersen, Peder J., Mariola Pytlikova, and Nina Smith. 2004. "Selection or Networks Effects? Migration Flows into 27 OECD Countries, 1990-2000." IZA Discussion Paper No. 1104.

Razin, Assaf, Efraim Sadka, and Phillip Swagel. 1998. "Tax Burden and Migration: A Political Economy Theory and Evidence." National Bureau of Economic Research Working Paper No. 6734.

Sjastaad, Larry A. 1962. "The Costs and Returns of Human Migration." *Journal of Political Economy*, 70(5): 80-93.

Stark, Oded, and David E. Bloom. 1985. "The New Economics of Labor Migration." *American Economic Review*, 75(2): 173-78.

Stark, Oded, and J. Edward Taylor. 1991. "Migration Incentives, Migration Types: The Role of Relative Deprivation." *Economic Journal*, 101(408): 1163-78.

Tienda, Marta, and Leif Jensen. 1986. "Immigration and Public Assistance Participation: Dispelling the Myth of Dependency." *Social Science Research*, 15(12): 372-400.

Usher, Dan. 1977. "Public Property and the Effects of Migration upon Other Residents of the Migrants' Countries of Origin and Destination." *Journal of Political Economy*, 85(5): 1001-20.

Vanderkamp, John. 1977. "The Gravity Model and Migration Behavior: An Economic Interpretation." *Journal of Economic Studies*, 4(2): 89-102.

Warin, Thierry, Phanindra V. Wunnava, and Hubert P. Janicki. 2008. "Testing Mundell's Intuition of Endogenous OCA Theory." *Review of International Economics*, Forthcoming.

Winkelmann, Rainer, and Klaus F. Zimmerman. 1993. "Aging, Migration and Labor Mobility," in *Labor Markets in an Aging Europe*. Paul Johnson and Klaus F. Zimmerman eds. Cambridge: Cambridge University Press, 255-83.

Wooldridge, Jeffrey M. 2002. *Econometric Analysis of Cross Section and Panel Data*. Cambridge: MIT Press.

World Bank. 2006. World Development Indicators. Vol. 2007. The World Bank: Washington.

Zimmerman, Klaus F. 1995. "Tackling the European Migration Problem." *Journal of Economic Perspectives*, 9(2): 45-62.