Academic Convergence and Migration: the effect of the BolognaProcess on European Mobility.

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Abstract

This paper investigates the effects of the Bologna Process on migration inflows within European countries between 2004 and 2017. To this aim, we rely on a large panel of bilateral flows between most of the European countries, and use several estimators. Our results show that the Bologna Process has a limited, when non-significant, impact on migration in Europe. Its effect is mostly visible in destination countries but is extremely weak when we focus on the implementation in origin countries. When detected, the effect of the Bologna Process is growing following its implementation. In contrast, Diasporas are important in explaining flows between countries. We also find that traditional variables such as common language and distance may not be as relevant as before in studying intra-European flows. Finally, we notice an unexpected negative effect of the adoption of the Euro.

Keywords : Bologna Process; Migration; Education; Gravity Model.
JEL codes : I23; J15; C33; J18.

1. Introduction

Migration plays a key role in shaping regional economies through many different channels. Indeed, it can be (i) a solution to the demographic challenge faced by European countries (see Pedersen et al. (2008)), (ii) a substantial factor for the smooth running of common currency areas such as the Euro Zone (Mundell (1961)),[3] and (iii) a tool to correct productivity differences and labor market

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[2]EconomiX, University of Paris Nanterre, France. Contact : rodry@parisnanterre.fr
[3]A broadly accepted precondition of optimal currency areas (OCA) is high labor mobility across regions or countries composing the former. This criteria relies on the smoothing effect of labor mobility across the labor markets included in the common currency area and seems consistent with the few experiences at our disposal.

mismatches (Kennan (2013), Clemens and Pritchett (2019)). It has also been shown to facilitate income convergence in Europe (Fischer and Pfaffermayr (2018)) and boost innovation in both private and public sectors (Bosetti et al. (2015), Fassio et al. (2019)). Despite the great importance of human flows in the stability and development of regional institutions and economies, the literature concludes to the presence of strong rigidities impeding individual mobility in Europe when comparing to other economically and demographically similar regions (House et al. (2018)). They are obviously several likely explanations for the weakness of migrations proper to Europe. Some are historical, cultural or institutional (as linguistic barriers) and out of the range of short- to middle-term political actions; but structural and conjectural reforms are still possible.

The Bologna Process (BP) is one of them. Launched in 1998 with the Bologna declaration, it is defined as "a mechanism promoting intergovernmental cooperation between 48 European countries in the field of higher education."[4] It aims at bringing more coherence in the higher education systems of European Union (EU) members and beyond, throughout the European Higher Education Area (EHEA). Three important measures of the higher education systems in the EHEA members are due to the Bologna Process: (i) the Licence-Master-Doctorat (LMD) schemes, (ii) the mutual recognition of qualifications obtained in universities abroad, and (iii) the common system of quality assurance to "strengthen the quality and relevance of learning and teaching". Consequently, it allows greater flows of European students and directly impacts two out of the three closely connected specifiers of labor force identified in Docquier et al. (2019), namely migration and education : (i) education, by promoting a specific learning framework and ensuring the quality of curricular content; and (ii) migration, by promoting the harmonization of formations and skills comparability between foreign and native workers. This paper investigates this possibility and aims at quantifying the effects of the Bologna Process on migration within Europe.

Our paper belongs to the body of literature on the determinants of migration. We focus on the impact of an institutional factor on bilateral migration in a defined area, i.e. European countries members of the EHEA. Empirical works on migration have been impeded by the lack of sufficiently large and reliable samples until recently. To overcome this constraint, Chiswick (1978) rely on the *1970 Census of Population* 5 percent questionnaire and focus on a cross-section analysis. He outlines a strong wage assimilation of foreign-born migrants in the U.S., partly due to investment

[4]European Commission.

in postschool training to adapt the U.S. labor market. Decressin and Fatás (1995) (henceforth, DF) apply the strategy developed in the seminal paper of Blanchard and Katz (1992)[5] to analyze labor migrations in regions within Europe.[6] They find that, contrary to the US,[7] most of the regional shocks in European regions are absorbed by changes in the participation rate and not by migration flows. Obstfeld et al. (1998) reach the same conclusion but both articles neglect structural variables as labor market specificities or educational attainment. Several authors have focused on finer region-based approach with the same strategy, highlighting the different characteristics of migrations in distinct groups of countries (Jimeno and Bentolila (1998);Bornhorst and Commander (2006);Dao et al. (2014)). Concurrently to these studies, the refinement of statistical information gathering has allowed a growing number of researchers to directly use migration flows and thus new models, such as gravity equations (Ortega and Peri (2013); Arpaia et al. (2016); Chakrabarti and Sengupta (2017)) or panel data econometrics (Hunt (2006)).

Skills and wages play a substantial role in explaining migration flows (Borjas (2001),Hunt (2006)). While Sanderson and Kentor (2008) show that Foregin Direct Investiments (FDI) have a positive impact on migration from less-developed countries, Jayet and Marchal (2016) achieve a subtlest conclusion controlling for skills with a variant of the Ricardian model. They observe that FDIs have a different impact on migration flows following the level of qualification of migrants. Using a two-countries model, they demonstrate that skilled workers and FDIs are complement, whereas unskilled workers and FDIs are substitutes. Similar results are found by Hoxhaj et al. (2016) who studied migrations and capital intensity of firms in Sub-Saharan Africa using a negative binomial model. Additional factors come into play: incomplete information about wages as deficient housing and rental market in host countries have, inter alia, a negative impact on migrations (Bornhorst and Commander (2006); Bonin et al. (2008)).

A second strand of the literature suggests that institutions – in a broad sense – also affect migra-

[5] They adopt an indirect method to capture labor migration by examining the joint behavior of employment rate, participation rate, and employment growth, and postulate that any change of the latter variable unexplained by the two previous ones has to stem from migration. Then, they estimate models of regional labor markets using a vector autoregressive model (VAR).

[6] They disaggregated their sample to obtain regions with similar population size. Five countries were divided in several regions while six were treated as a single region.

[7] Blanchard and Katz (1992) notice that interstate migration is the main adjustment variable following a regional shock within the US.

tion. It can be labor market institutions (Blanchard and Wolfers (2000)),[8] higher education quality (Hanushek and Kimko (2000)), language or European institutions. Bartz and Fuchs-Schündeln (2012) investigate the effects of linguistic diversity, the Euro Zone and the Schengen area membership on labor mobility in Europe. They find that language differences are impeding a greater integration of the labor market in Europe, while European institutions have no impact. Beine et al. (2019), Beyer and Smets (2015) and Arpaia et al. (2016) reach a more nuanced response.

Most of the studie above-mentioned use EU membership, participation to the European Monetary Union or to the Schengen Area as proxies of the European integration to study the impact it can have on labor mobility. However, other European policies and institutions may have a significantly equal, if not greater, impact on intra-European migrations such as the Bologna Process. As stated by Fries-Tersch et al. (2018), limited language skills and deficiency in recognition of qualification are the main obstacles to getting a suitable job in the case of EU15 and EU13 movers while employment opportunity is an important pull factor for mobile workers. The Bologna Process deals with both of these barriers as it aims at harmonizing educational systems, qualifications recognition and increasing internal mobility of students.[9] Suppositions have been made on the (positive) impact of the Bologna Process on labor mobility (Bonin et al. (2008); Beyer and Smets (2015);de la Rica et al. (2013)) but, to our knowledge, neither theoretical nor empirical studies have been conducted to assess the impact of the Bologna Process on labor mobility in Europe.

We aim at filling this gap in the present paper. We go further than the previous literature that mainly focuses on flows into one country only, and rely on a large panel of bilateral flows between most of the European countries. We estimate several regressions models on migration flows from 26 to 30 OECD countries, all of them member of the EHEA, annually for the period 2004-2017. We define a Bologna Process Indicator based on the bi-annual reports produced by the Bologna Implementation Coordination Group. Our estimations show that the Bologna Process has not clearly identify effect on bilateral flows of migrants.

The rest of the paper is organized as follows. Section 2 provides some brief stylised facts on migration in Europe. Section 3 describes the theoretical model used to justify our empirical approach,

[8]In Blanchard and Wolfers (2000), "labor market institutions" refer to unemployment insurance system for instance, or legal framework that regulates labor.

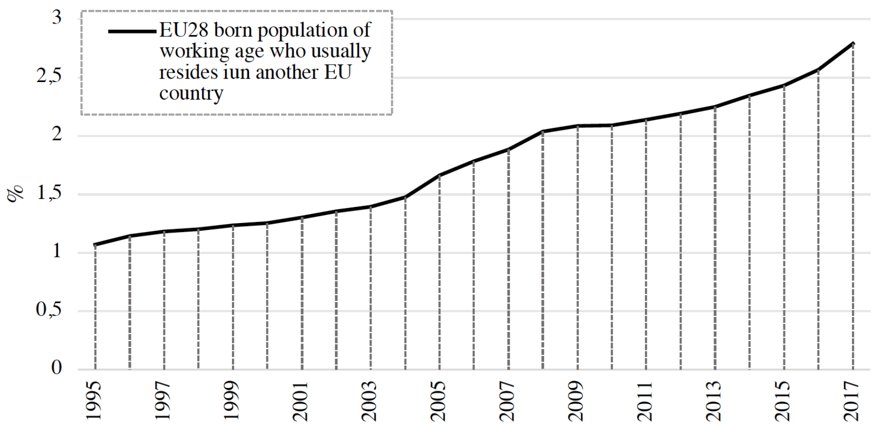
[9]As pointed out by de la Rica et al. (2013), internal mobility of students may help them to improve their second-languages skills, be aware of cultural specificities proper to foreign countries and characteristic features of their labor markets.

as well as the data necessary to estimate the impact of the Bologna Process on migrations. In Section 4 we present and discuss the results. Section 5 concludes the paper.

2. Migration trends

Migration within Europe has increased overall for the last decades. As it can be seen in Figure 1, the share of EU28 born population living in another EU28 country has steadily grown, from 1.07% in 1995 to 2.57% in 2016. Particularly, the 2004 enlargement to Eastern European countries

Figure 1: Share of the EU28 population living in another EU28 country

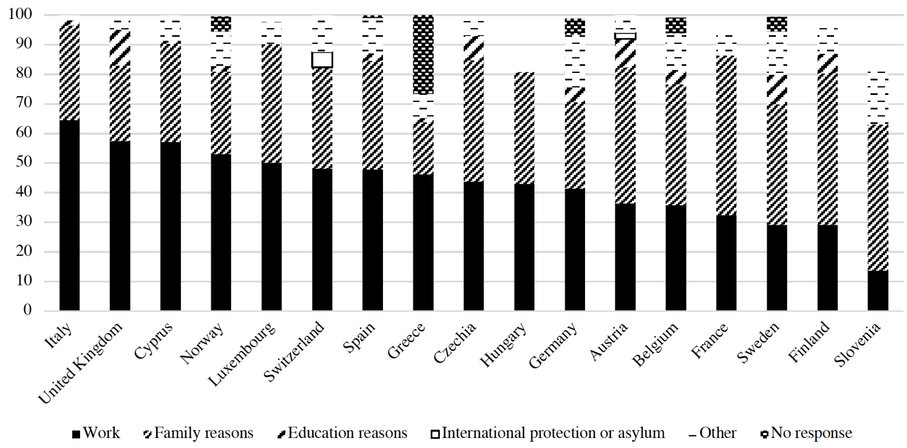


Source : Eurostat, author's calculations

has strongly and positively impacted migration within Europe. The 2007 subprime crisis had no observable effects (but it corresponds with the enlargement of the EU to Romania and Bulgaria). A slowdown in migrations flows is noticeable in 2010, supposedly consecutive to the debt crisis in Europe. In spite of a significant increase, mobility in Europe remains limited when compared to the US inter-States one (OECD (2018)). Reasons to move are different between Europeans (i.e. EU28 citizens here) and non-Europeans. As can be seen in Figures 2 and 3, work is the most common reason cited among the EU28 movers (43% on average against 37% for family reasons), while immigrants from non-EU28 countries move mainly because of family-related reasons (respectively 29% and 45%). These results partly reveal the barriers faced by migrants from non-European countries in accessing the labor market.

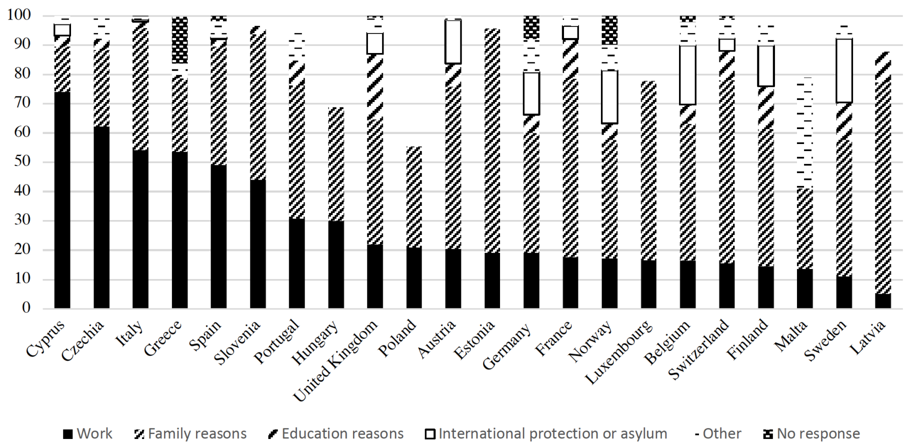
Europeans also tend to move more often when they already have found a job in the host country before migrating (Figure 4) than non-European migrants (Figure 5). EU28 citizens that have found a

Figure 2: Reasons to migrate for EU28 citizens, 2014 survey



Source : Eurostat, own calculation

Figure 3: Reasons to migrate for non-EU28 citizens, 2014 survey

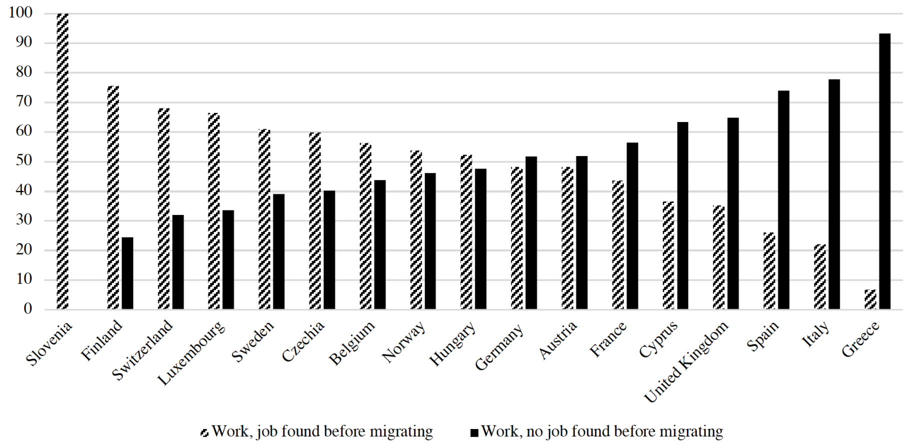


Source : Eurostat, own calculation

job in the host country before moving represent half of the work-related migrations of EU28-countries citizens against just over one third of non-EU28 migrants.

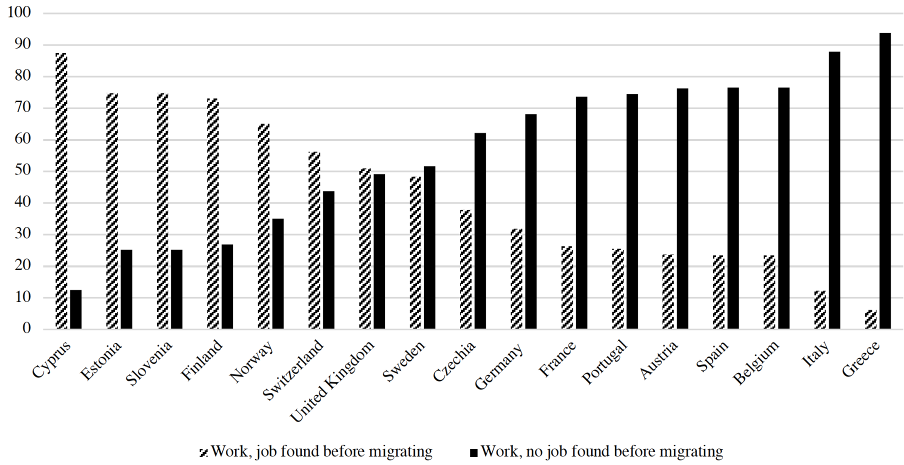
Their employability has also increased these last years to a broader extent than the one of non-European movers. As illustrated in Figure 6, the employment rate of European citizens has increased since 2006 and particularly the one of skilled workers (“tertiary”). Unskilled workers (“primary”) have also known an increase in their employability abroad, but to a lesser extent. On

Figure 4: EU28 migrants by jobs search process, 2014 survey



Source : Eurostat, own calculation

Figure 5: Non-EU28 migrants by jobs search process, 2014 survey

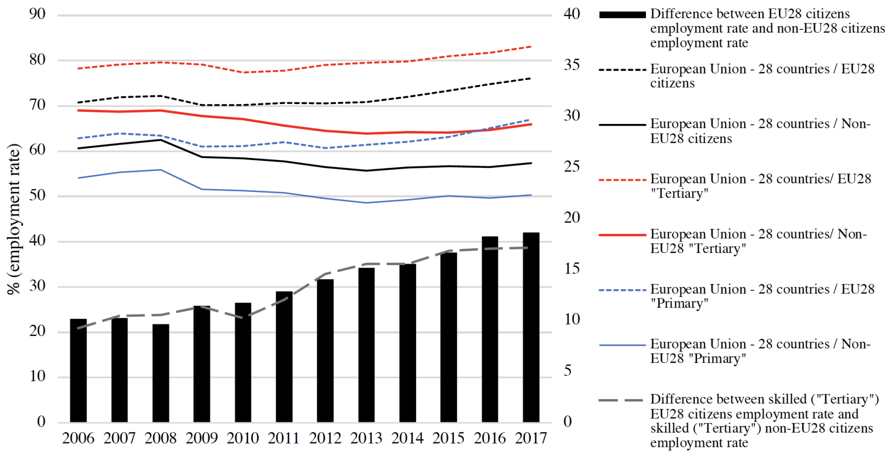


Source : Eurostat, own calculation

the contrary, the employment rate of non-European workers has not significantly moved since 2013 and the employment rate of skilled non-EU28 workers has faintly risen. The same conclusion can be inferred from the difference between employment rates : the immigrant employment rate gap, both indistinctly from the level of skills and controlling for it, has widened between 2009 and 2017.

The causes of unemployability among immigrants are different depending on their origin coun-

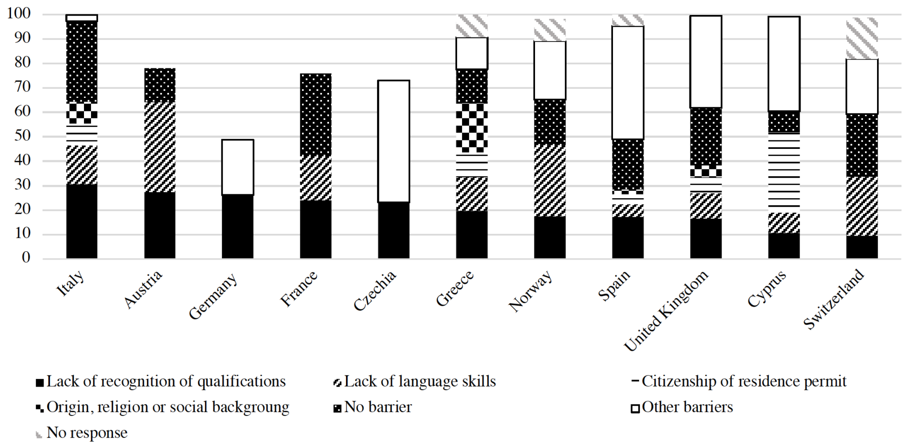
Figure 6: Employment rate for immigrants from EU28 and non-EU28 countries in EU28 countries, 2006-2017



Source : Eurostat, own calculation (left axis is for the percentage differences)

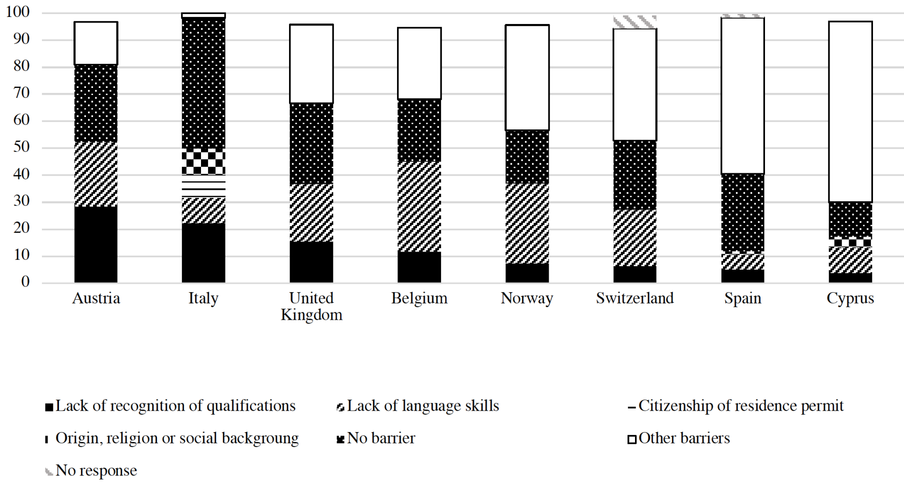
tries. Employed EU28 citizens mainly did not face any barrier on the job market or mention the lack of language skills of the host country (Figure 7), while employed non-EU28 citizens more frequently cite the lack of recognition of qualifications as an obstacle than European ones (Figure 8). At the sight of the report date (2014) where the above-mentioned numbers are extracted from, we can identify the first consequences of the Bologna Process, who aims at reducing heterogeneity among diplomas and qualifications.

Figure 7: Obstacles to getting a suitable job faced by employed non-EU28 citizens



Source : Eurostat

Figure 8: Obstacles to getting a suitable job faced by employed EU28 citizens



Source : Eurostat

3. Methodology and data

3.1. Theoretical model

A common and effective way to study migration flows is the 'gravity model'. Pionnered by Tinbergen (1962) in international trade flows, [10] it has progressively become the workhorse for analyzing intra- and international migration flows. In the previous section, we stressed the importance of labor market situations and, implicitly, of wages in migration choices. Accordingly, our empirical analysis is based on a theoretical model known as the income maximisation approach (IMA) (Roy (1951), Borjas (1987)). It has the advantage of being seamlessly estimated and to substantiate the actual literature on international migrations (Beine et al. (2019)). The IMA is a derivation of a random utility model (RUM) where agents optimally chose their location through the maximization of an expected utility.[11] They choose between a set of countries, including their home country, each one with specific characteristics. Equation (1) [12] presents the utility of an agent from the country i

[10]Ravenstein (1855) is the first to indirectly use the notion of gravity to explain migration in the United-Kingdom.

[11]"RUM discrete choice models are based on the assumption that the utility of the alternative i of the choice set $C = 1, 2, ...m$ is the sum of a deterministic component or systematic utility V_i and a random component ϵ_i that accounts for the error in the perception of the utility : $U_i = V_i + \epsilon_i$" (Del Castillo (2016)).

[12]We adopt the notation of Beine et al. (2019)

willing to stay in this country at time t :

$$u_{ii,t} = \ln[E(y_{i,t})] + A_{i,t} + \varepsilon_{i,t} \tag{1}$$

where $u_{ii,t}$ is the utility of agent i. It log-linearly depends on the potential income the agent can get in his actual country ($E(y_{i,t})$) and linearly on the native country specificity ($A_{i,t}$). $\varepsilon_{i,t}$ is an independent and identically distributed (iid) extreme-value distributed random term (McFadden (1984)). The equation slightly differs when the agent migrates, giving Equation (2) :

$$u_{ij,t} = \ln[E(y_{j,t})] + A_{j,t} - C_{ij} + \varepsilon_{j,t} \tag{2}$$

Here, $u_{ij,t}$ is the utility the agent can gain from migrate to j from i at time t. It is also log-linearly depending on the expected income ($E(y_{j,t})$), the migration j-country specificity (A_j) and the cost of migration (C_{ij}) the agent would receive or bear in the destination country j. We suppose that there is no cost to support when deciding to stay in the native country. $\varepsilon_{j,t}$ satisfies the same condition as $\varepsilon_{i,t}$.

The distributional assumption of the random term is important. As shown by McFadden (1974), under this assumption the probability model of migration is the multinomial logit :

$$Pr(u_{ij,t} = \max_k u_{ik,t}) = \frac{\exp(u_{ij,t})}{\sum_k \exp(u_{ik,t})} \tag{3}$$

Reasoning at a macro-level, the probability in (3) takes the form of the ratio between the number of migrants to the country j ($N_{ij,t}$) and the total population of country i ($N_{i,t}$). In view of this and considering Equations (1) and (2), we can define the equilibrium rate to emigrate for a i-country population a time t as :

$$\frac{N_{ij,t}}{N_{i,t}} = \frac{\exp\left[\ln[E(y_{j,t})] + A_{j,t} - C_{ij,t}\right]}{\sum_k \exp\left[\ln[E(y_{k,t})] + Ak,t - C_{ik,t}\right]} \tag{4}$$

Similarly, we can define the equilibrium equation for the i-country population to stay in its country as :

$$\frac{N_{ii,t}}{N_{i,t}} = \frac{\exp\left[\ln[E(y_{i,t})] + A_{i,t}\right]}{\sum_k \exp\left[\ln[E(y_{k,t})] + Ak,t - C_{ik,t}\right]} \tag{5}$$

From (4) and (5), we can deduce the equation of the equilibrium bilateral migration rate, to which we apply the logarithm:

$$\ln\left(\frac{N_{ij,t}}{N_{ii,t}}\right) = \ln\left(\frac{E(y_{j,t})}{E(y_{i,t})}\right) + A_{j,t} - A_{i,t} - C_{ij,t} \tag{6}$$

and simply rewrite the equation to obtain the expression of the i-to-j migration flow :

$$\ln(N_{ij,t}) = \ln[E(y_{j,t})] - \ln[E(y_{i,t})] + A_{j,t} - A_{i,t} - C_{ij,t} + \ln(N_{ii,t}) \tag{7}$$

Equation (7) is useful since it allows us to decompose the migration flow between two countries in separate elements we can measure independently. The bilateral migration flow ($\ln(N_{ij,t})$) depends on the expected income differential ($\ln[E(y_{j,t})] - \ln[E(y_{i,t})]$), the difference of country characteristics ($A_{j,t} - A_{i,t}$), the cost of migration ($C_{ij,t}$), but also the number of native workers from country i staying in their own country at time t ($\ln(N_{ii,t})$).

3.2. Empirical model

We assume that the expected labor income in a given country of destination i can be decomposed into its GDP per capita ($GDP_{i,t}$ and its employment rate ($un_{i,t}$)) . Country specificities ($A_{i,t}$) include institution-related variables, such as the adhesion to the Euro area ($EZ_{i,t}$, equals to 1 when the country i joins the Euro area), the European Union membership ($EU_{i,t}$, equals 1 when the country i joins the European Union), the Schengen area ($Schengen_{i,t}$, equals 1 when the country i joins the Schengen area) and the community of migrants already present in country j, i.e. the Diaspora ($\ln(Dias_{i,t})$). We add a dummy variable related to the Bologna Process (BP) ($\sum_{n=1}^{5} BP_{n,i,t}$, n being the level of implementation of the BP in the country i at time t). To that, as proxies to migration costs, we add a geographical distance variable from a j country ($Dist_{ij}$) and a common language variable ($Comlan_{ij}$) as a proxy to cultural distance. Thus, the utility of the agent can be expressed as :

$$\begin{aligned} \ln[E(y_{j,t})] + A_{j,t} - C_{ij,t} =& \ln(GDP_{j,t} + un_{j,t}) + EZ_{j,t} \\ &+ EU_{j,t} + Schengen_{j,t} + \ln(Dias_{j,t}) \\ &+ \sum_{n=1}^{5} BP_{n,j,t} - (Dist_{ij} - Comlan_{ij}) \end{aligned} \tag{8}$$

From (7) and (8), we derive the following estimated equation :

$$\begin{aligned}
\ln(N_{ij,t}) = & \beta_0 + \beta_1 \ln(GDP_{j,t}) + \beta_2 \ln(un_{j,t}) \\
& + \beta_3 EZ_{j,t} + \beta_4 EU_{j,t} + \beta_5 Schengen_{j,t} + \beta_6 \ln(Dias_{j,t}) \\
& + \beta_7 \sum_{n=1}^{5} BP_{n,j,t} \\
& + \beta_8 Dist_{ij} + \beta_9 Comlan_{ij} \\
& + \alpha_{i,t} + \epsilon_{ij,t}
\end{aligned} \tag{9}$$

α_i represents the i-country-varying fixed effect. We include this fixed effect to embody the advantages individuals can get from staying in their origin country, the i-country population staying in this country, and a time-varying fixed effect : $\alpha_{i,t} = \ln[E(y_{j,t})] + A_{i,t} + \ln(N_{ii,t}) + \alpha_t$, ensuring the equilibrium condition and the multilateral resistance (Bertoli and Moraga (2013)). We do not include a time-invariant dyadic effect (α_{ij}), indistinguishable from the cost variables ($Comlan_{ij}$ and $Dist_{ij}$). Assuming that, as $A_{j,t} = EZ_{j,t} + EU_{j,t} + Schengen_{j,t} + \sum_{n=1}^{5} BP_{nj,t}$, we could also have written $A_{i,t} = EZ_{i,t} + EU_{i,t} + Schengen_{i,t} + \sum_{n=1}^{5} BP_{n,i,t}$, and deduced the alternative equation, respecting the equilibrium condition :

$$\begin{aligned}
\ln(N_{ij,t}) = & \beta_0 + \beta_1 \ln(GDP_{i,t}) + \beta_2 \ln(un_{i,t}) \\
& + \beta_3 EZ_{i,t} + \beta_4 EU_{i,t} + \beta_5 Schengen_{i,t} + \beta_6 \ln(Dias_{j,t}) \\
& + \beta_7 \sum_{n=1}^{5} BP_{n,i,t} + \beta_8 Dist_{ij} + \beta_9 Comlan_{ij} + \alpha_{j,t} + \alpha_{i,t} + \epsilon_{ij,t}
\end{aligned} \tag{10}$$

We may face an estimation issue: as written in Beine et al. (2009), the occurrence of zero values for the dependent variable in a large portion of the observations can lead to inconsistent OLS estimates. Figure 9 shows the percentage frequency histogram of our dependent variables *inflows*. Approximately 4% of our migration flows observations have a zero value. This percent decreases to slightly less than 1.5% when we take the logarithm of *inflows*. In the first case, the distribution of *Inflows* is close to the over-dispersed Poisson or over-dispersed Negative Binomial distributions.[13] When taking the logarithm of our variable of interest, the obtained distribution seems to fit a Negative Binomial or a Poisson distribution : the dispersion is reduced compared to the previous situation. 15.24% of our values are missing. The Poisson Pseudo-Maximum Likelihood (PPML) estimator developed by Santos Silva and Tenreyro (2006) can deal with over-dispersed

[13]When over-dispersion is observed, standard errors and p-values tend to be too small.

Poisson distribution and thus be a good candidate to estimate our model. Another method which deals with the distribution features but is less frequent in the literature is the Negative Binomial regression model.[14] These estimators are maximum or pseudo-maximum likelihood estimators. The PPML estimator is designed to take into account fixed effects and estimate model with count data as dependent variable. The Negative Binomial share the same objective, but they are two-part model. The Poisson regression model is given by:

$$y_i \sim \text{Poisson}(\mu_i) \tag{11}$$

with

$$\mu_i = \exp(x_i\beta + offset_i) \tag{12}$$

The Negative Binomial regression model is distinguished from the Poisson regression model since it supposes an omitted variable in the data generating process of μ_i:

$$\mu_i = \exp(x_i\beta + offset_i + v_i) \tag{13}$$

where

$$e^{v_i} \sim \text{Gamma}(1/\alpha, \alpha) \tag{14}$$

This parametrization allows us to take into account the over-dispersion of the Poisson distribution. We also use more common techniques such as the Ordinary Least Square (OLS) and the Scaled Ordinary Least Square (SOLS) estimators. The SOLS consists of a modification of the OLS estimator procedure : we add 1 to every value prior to the log-transformation to not loose the zero-valued data (graph (2;1) in Figure 9).

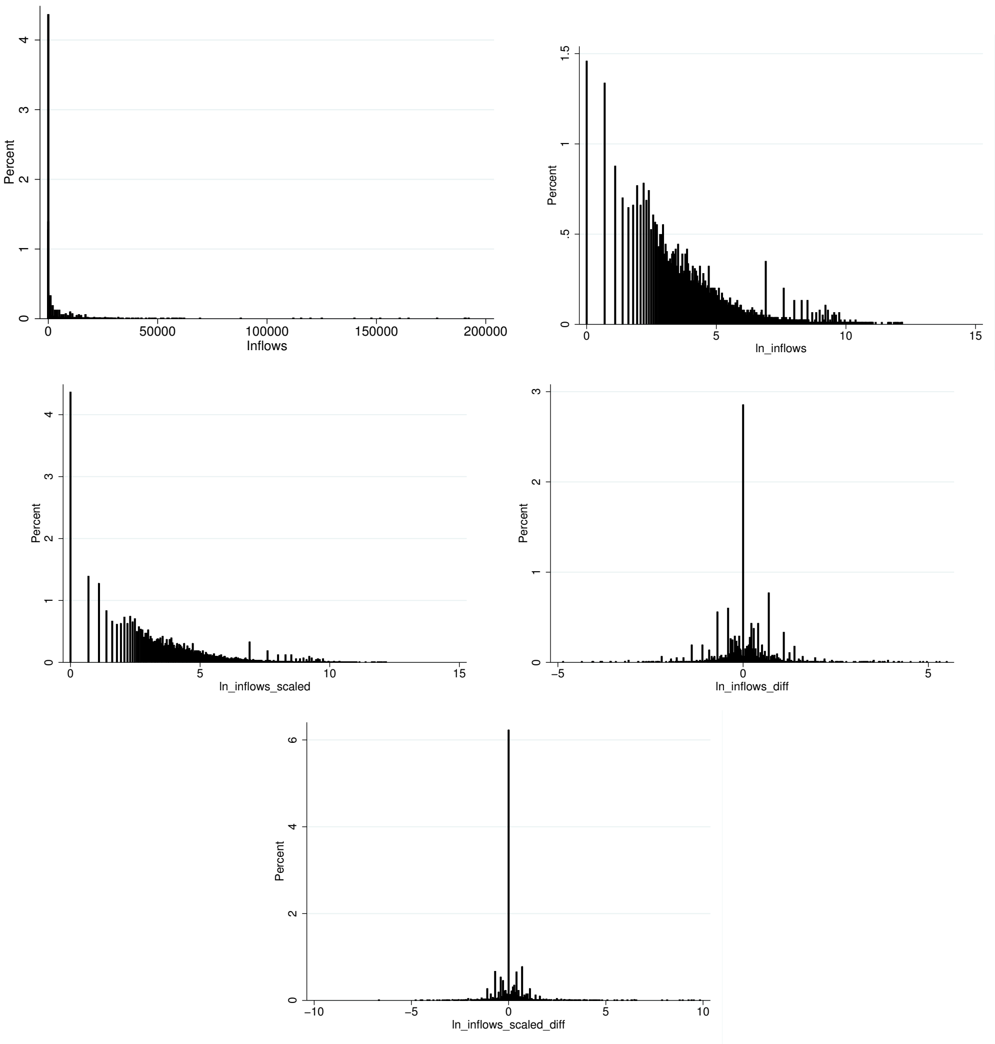
3.3. Data

Our source of information for migration flows and diasporas in Europe is the OECD International Migration Database.[15] Flows are derived from three sources : population registers, residence and/or work permit and specific survey; the unit is the migrant. The nature of the data does not allow us to distinguish between job-, family- or study-related migrations. Each of these flows has its proper characteristics, but we aim here at compute the aggregate impact. We have a dataset of 26

[14] The Zero-inflated Poisson (ZIP) or the Zero-inflated Negative Binomial (ZINB) regression constitue alternative candidates but require the use of an instrumental variable.

[15] As a proxy of the Diaporas, we use the stock of foreign-born population by country of birth.

Figure 9: Distribution of the dependent variables Inflows



destination countries[16] and 30 origin countries[17] over the period 2004-2017. We split the sample

[16]The destination countries are: Austria, Belgium, Switzerland, Czechia, Germany, Denmark, Spain, Estonia, Finland, France, Great-Britain, Hungary, Ireland, Iceland, Italy, Lithuania, Luxembourg, Latvia, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Sweden and Turkey.

[17]The origin countries are: Albania, Austria, Belgium, Bosnia and Herzegovina, Czechia, Cyprus, Switzerland, Germany, Denmark, Spain, Estonia, Finland, France, Great-Britain, Hungary, Croatia, Ireland, Iceland, Italy, Lithuania, Luxembourg, Latvia, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Sweden and Turkey.

in 2 subgroups : core[18] and peripheral countries.[19] The unemployment rate and the GDP per capita[20] are from the World Development Indicators Database produced by the World Bank. Data on common languages and distances were extracted from the GeoDist database (Mayer and Zignago (2011)). Euro area, Schengen and European Union (EU) memberships originated from the official website of the European Union.

The Bologna indicator used is constructed from the one available in the Bologna Process Implementation and Bologna Process Stocktaking Reports.[21] It is a discrete index color-coded[22] that we ranged from 1 to 5, 1 associated with a poor implementation and 5 with an excellent implementation of the Bologna Process. Criteria composing the index changed over the reports as the absolute implementation of the BP progressed, rendering obsolete part of the scales and of the criteria over time while new procedures and rules appeared. But three main categories remained stable: the *Quality Assurance*, the *Two-cycle Degree System* and the *Recognition of Degree*. We compute geometric means, rounded off, for each country and each year to define a unique Bologna Process Indicator. The use of the geometric mean aims at taking into consideration the spread of country scores and reducing the influence of high values.[23]

The make-up of the index is based on the declarations of countries : evaluation of the taken measures and legislation is at the sole discretion of the member countries. Data are mainly based on a questionnaire elaborated by the EURYDICE agency. This aspect of our interest variable is its principal fragility. Yet, it is the only available indicator at our disposal. In addition, produced reports give one value per country and category for the years following the last published reports. Legislative and institutional changes being long-term evolutions, we simply reproduced the same score for all the period between two reports (the last report is the reference).[24] Table 10 presents the statistical

[18] Austria, Belgium, Switzerland, Germany, Denmark, Spain, Finland, France, Great-Britain, Ireland, Italy, Netherlands, Norway, Sweden and Liechtenstein.

[19] Albania, Bosnia and Herzegovina, Czechia, Cyprus, Estonia, Hungary, Croatia, Island, Lithuania, Latvia, Poland, Portugal, Slovakia, Slovenia, Serbia and Turkey.

[20] Constant 2010 $US

[21] The first report was realized in 2005, and produced at a 2 to 3 years frequency afterward (2005, 2007, 2009, 2012, 2015 and 2017).

[22] The color code adopted in the report is the following: dark green (excellent performance, in our transcription : 5), light green (very good performance, 4), yellow (good performance, 3), orange (some progress has been made, 2) and red (little progress has been made, 1)

[23] Tables 9 and 10 shows the values of the Bologna Process indicator from 2004 to 2017 for all countries of our sample.

[24] We have also produced dyadic variables from the Bologna indicator, taking into account the level at the source

features of the different variables.

4. Results

Table 1 presents the results of the estimation of equation (9), with the different specifications previously mentionned.[25] The first column of each estimator is a control regression, omitting the key variables "Bologna Process indicator (ind.)". The first specification for columns (1) and (2) is the OLS estimator. Outcomes in columns (3) and (4) are obtained with the SOLS (Scaled OLS) method, while columns (5) and (6) present the results from the PPML estimators. Columns (7) and (8) show the results we achieved from the Negative Binomial estimator (NegBin).

Overall, our results suggest that the Bologna Process, implemented in the destination country plays an ambiguous role in explaining bilateral migration flows. As it can be seen in Table 1, the OLS, SOLS and the PPML estimates conclude to a significant but unexpected evolution of the BP process: compared to the highest level of implementation (BP = 5), BP = 2 and BP = 4 lead to lower migration flows incoming, but BP = 3 is associated to a higher level of migration flows (respectively 0.107%, 0.753% and 0.184%). The Negative Binomial estimates do not indicate any effect of the BP on migration (only "BP = 2" is significant and negative.) We, then, cannot conclude to a clearly significant, positive and growing effect of the Bologna Process on migration flows, but we can notice that implementing the Bologna Process has a small positive impact.

Other institutional factors impact migration flows. In this way, being a member of the European Union for the destination country influences the flows positively when significant, increasing by an average of 0.26% the flows. The Diaspora has a significant and positive impact in every estimations, in line with the results in Beine et al. (2009). Being a member of the Eurozone has no clear effect : only two estimators out of four identify a significant effect with contradicting signs. Indeed, the SOLS estimates indicates a negative effect of the Eurozone membership of approximately 0.256% while the PPML one shows a positive impact of 0.330%. Surprisingly, the common language, the distance between countries and the Schengen area do not affect bilateral flows.

Concerning the control variables, it is worth noting that GDP seems to have a significant and positive impact, going from 0.1% to 0.6%. In other words, an increase in GDP in the destination

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and at the destination. Results obtained are hardly useful since estimators struggles to define and compute the effect of this variable.

[25] The plurality of estimators will also help us in checking the robustness of our results.

Table 1: Destination-country specific determinants of Migration in Europe

	OLS		SOLS		PPML		NegBin	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GDP	0.312****	0.324****	0.407****	0.667****	-0.187	-0.170	0.108****	0.106****
	(0.0813)	(0.0847)	(0.104)	(0.129)	(0.141)	(0.139)	(0.0200)	(0.0218)
Unemployment	-0.340****	-0.286****	-0.455****	-0.418***	-0.934****	-0.958****	-0.0407**	-0.0324
	(0.0786)	(0.0774)	(0.124)	(0.129)	(0.137)	(0.140)	(0.0195)	(0.0197)
Eurozone	0.0839	0.109	-0.252***	-0.264***	0.347****	0.322****	-0.00520	-0.00139
	(0.0704)	(0.0680)	(0.0965)	(0.0971)	(0.0953)	(0.0949)	(0.0160)	(0.0163)
EU membership	0.253***	0.223**	0.443****	0.509****	0.0136	0.0642	0.0844****	0.0800****
	(0.0918)	(0.0902)	(0.131)	(0.139)	(0.138)	(0.139)	(0.0235)	(0.0238)
Diaspora	0.830****	0.815****	0.722****	0.687****	0.883****	0.879****	0.145****	0.141****
	(0.0212)	(0.0212)	(0.0419)	(0.0441)	(0.0389)	(0.0395)	(0.00405)	(0.00417)
Schengen	-0.0929	-0.158	-0.294**	-0.597****	0.0464	0.0178	0.0457	0.0309
	(0.126)	(0.126)	(0.142)	(0.162)	(0.167)	(0.168)	(0.0314)	(0.0320)
Common Language	0.168	0.165	0.106	0.155	0.0173	0.0268	-0.00463	-0.00413
	(0.231)	(0.227)	(0.363)	(0.348)	(0.119)	(0.118)	(0.0285)	(0.0286)
Distance	0.00174	-0.0328	-0.0267	-0.0585	0.199***	0.183**	-0.00246	-0.00959
	(0.0558)	(0.0559)	(0.0936)	(0.0938)	(0.0737)	(0.0728)	(0.0116)	(0.0117)
Bologna ind. = 2		-0.987****		-0.486***		-1.556****		-0.298****
		(0.152)		(0.170)		(0.287)		(0.0685)
Bologna ind. = 3		0.107*		0.753****		0.184**		0.0222
		(0.0600)		(0.136)		(0.0850)		(0.0239)
Bologna ind. = 4		-0.102***		-0.249****		-0.0767*		-0.0215
		(0.0345)		(0.0551)		(0.0408)		(0.0154)
Bologna ind. = 5		0		0				0
		(.)		(.)				(.)
Constant	-3.788****	-3.566***	-3.475***	-5.655****	0.129	0.185	-0.676**	-0.582*
	(1.060)	(1.084)	(1.175)	(1.264)	(1.760)	(1.704)	(0.292)	(0.304)
N	4784	4784	4969	4969	4969	4969	4784	4784
R^2	0.878	0.882	0.618	0.636				
AIC	11325.2	11161.8	18210.2	17962.5	4482838.0	4387868.8	18505.4	18483.8
BIC	13519.6	13375.6	20417.4	20189.2	4485090.8	4390102.1	21081.6	21079.4

Note : the dependent variable for the OLS and the Negative Binomial (NegBin) estimator is ln(inflows) while the SOLS estimator uses ln(scaled inflows) and the PPML one uses inflows. The variable "Bologna ind. = 5" has been omitted because of collinearity problem. Robust standard errors in parentheses, $* : p < 0.1, ** : p < 0.05, *** : p < 0.01, **** : p < 0.001$

countries attracts more flows from other countries. Results of the unemployment variable are in line with the findings in the literature : an increase of 10% in the unemployment rate leads to a drop of 2.8% to 9.5% of bilateral migration flows.

Equation (9) focuses on one side of the phenomenon: controlling only for how the Bologna Process is implemented in the destination country indicates how the national labor market requirements are harmonized, in term of skills or qualifications. But it gives limited information on migrants themselves. We now estimate the impact of the Bologna Process implementation in the origin country on migration flows with equation (10). The results will cover the other side of the Bologna

Process effect, i.e. the formation of migrants.

Estimate of equation (10) are presented in Table 2. Variables GDP, Unemployment, Eurozone, EU membership, Schengen, and the Bologna Indicators ones are proper to the sending country, while the variables Diaspora, Common Language and Distance are identical to those in Table 1. Table 2 is organised as Table 1.

Similarly to the above, we do not find evidence that the Bologna Process implementation in the origin country plays a role in influencing bilateral migration flows. Indeed, no significant and continuous results appears. The PPML and the NegBin estimators conclude to no significant results of the Bologna Process in the sending country, while the OLS estimator indicates a slight upward trend (a positive impact of the Bologna Process implementation) and the SOLS estimator a positive tendency but only one significant result.

Regarding the other variables, we first find a robust elasticity of the GDP. A 10% increase of the GDP in the home country lead on average to a 2.6% decrease of the bilateral flows (0.25% for the NegBin estimator). This result is in line we what one can expect since higher revenues reduce the incentive to leave the country. The unemployment rate also impacts, in the expected way, the bilateral migration flows: depending on the estimation method, a 10% increase of the unemployment rate in a country can trigger a rise of 1.6% to 3% of the outgoing flows.

Surprisingly, being a member of the Eurozone has a negative impact on outgoing migration flows. This result contradicts several works such as Ortega and Peri (2013) and Beine et al. (2019) and contrast with what the literature indicates. Explaining this result would need longer analysis and investigations, proper to an independent article and, in consequences, beyond the scope of this article.

A core-periphery analysis

Using Equation (9) and (10), we refined our analysis by cutting our samples in two sub-samples: the core countries and the peripheral countries. This dissociation seems legitimate as keeping the sample as a whole is gathering a group of economically and socially heterogeneous countries. Moreover, migration flows can behave differently following the level of the GDP per capita (Zelinsky (1971)). Our distinction roughly take into account these phenomenons.The results are displayed in Tables 3 and 4.

When focusing on destination-specific characteristics, we can hardly conclude to any specific effect of the Bologna Process. The NegBin and the PPML estimators fails to identify half of the Bologna

Table 2: Origin-country specific determinants of Migration in Europe

	OLS		SOLS		PPML		NegBin	
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
GDP	-0.211****	-0.243****	-0.257****	-0.304****	-0.285***	-0.288***	-0.0212*	-0.0275**
	(0.0521)	(0.0556)	(0.0604)	(0.0646)	(0.0985)	(0.0964)	(0.0128)	(0.0136)
Unemployment	0.166**	0.168**	0.165*	0.155*	0.306****	0.303****	0.0451**	0.0445**
	(0.0788)	(0.0737)	(0.0966)	(0.0895)	(0.0888)	(0.0842)	(0.0190)	(0.0194)
Eurozone	-0.231****	-0.198****	-0.209****	-0.159***	-0.332****	-0.345****	-0.0568****	-0.0503***
	(0.0499)	(0.0498)	(0.0573)	(0.0564)	(0.0912)	(0.0959)	(0.0159)	(0.0166)
EU membership	0.585****	0.564****	0.466****	0.439****	1.195****	1.202****	0.115****	0.111****
	(0.0938)	(0.0920)	(0.109)	(0.107)	(0.192)	(0.195)	(0.0187)	(0.0192)
Diaspora	0.792****	0.790****	0.758****	0.755****	0.769****	0.769****	0.137****	0.136****
	(0.0219)	(0.0218)	(0.0274)	(0.0273)	(0.0340)	(0.0336)	(0.00397)	(0.00400)
Schengen	0.387****	0.382****	0.312****	0.301****	0.195**	0.212**	0.0811****	0.0800****
	(0.0580)	(0.0569)	(0.0664)	(0.0650)	(0.0912)	(0.0893)	(0.0172)	(0.0173)
Common Language	-0.244*	-0.246*	-0.279*	-0.278*	-0.00371	0.00478	-0.0602**	-0.0610**
	(0.144)	(0.144)	(0.144)	(0.145)	(0.130)	(0.130)	(0.0280)	(0.0281)
Distance	-0.0102	-0.0135	0.00576	0.00572	-0.0836	-0.0938	-0.0138	-0.0141
	(0.0516)	(0.0524)	(0.0633)	(0.0635)	(0.0653)	(0.0671)	(0.0108)	(0.0110)
Bologna ind. = 2		-0.230*		-0.207				-0.0347
		(0.139)		(0.153)				(0.0412)
Bologna ind. = 3		-0.123**		-0.181***		0.115		-0.0255
		(0.0580)		(0.0665)		(0.222)		(0.0208)
Bologna ind. = 4		-0.0345		-0.0290		0.0976		-0.00593
		(0.0380)		(0.0418)		(0.205)		(0.0162)
Bologna ind. = 5		0		0		0.00281		0
		(.)		(.)		(0.214)		(.)
Constant	0.931	1.354**	1.713**	2.296***	0.927	0.568	0.758****	0.839****
	(0.656)	(0.681)	(0.766)	(0.805)	(1.553)	(1.448)	(0.194)	(0.202)
N	4784	4784	4969	4969	4969	4969	4784	4784
R^2	0.900	0.900	0.871	0.872				
AIC	10299.5	10284.9	12745.3	12724.8	3185845.7	3169097.2	18045.6	18049.7
BIC	11600.6	11605.4	14080.1	14079.1	3187187.0	3170451.5	19405.0	19428.4

Note : the dependent variable for the OLS and the Negative Binomial (NegBin) estimator is ln(inflows) while the SOLS estimator uses ln(scaled inflows) and the PPML one uses inflows. The variable "Bologna ind. = 5" has been omitted because of collinearity problem, except for the PPML estimator where The variable "Bologna ind. = 2" has been omitted because of collinearity problem. Robust standard errors in parentheses, $* : p < 0.1, ** : p < 0.05, *** : p < 0.01, **** : p < 0.001$

Process state of implementation coefficients. The OLS and SOLS estimators do not identify clearly the variable"Bologna ind. = 5" and "Bologna ind. = 2", which make the findings relative to the two other Bologna Indicators difficult to interpret. While the unemployment has the expected effect (an increase in the receiving country decrease the incoming flows of migrants), the GDP variable negatively impact the inflows in 5 out of 8 estimations. Distance seems to have no impact in most of the case (excepted with the SOLS estimators). The Eurozone, the EU membership and the Schengen area have no noticeable effect contrary to the Diaspora which plays a strongly significant and positive role (approximately 0,7% following a 1% positive shock). A plausible explanation is the long and irreversible nature of the institutional changes in our sub-sample. In the previous case, the destination countries presented a higher variance in terms of institutional changes (successive entries in the Eurozone, the European Union and the Schengen Area). In the present sub-sample, this variance is diminished by the similar political timeline and the nature of the variables used (dummies).

Applying the same strategy as below, we adopt the origin-country characteristics and obtain the Table 4. Here also, it is hard to conclude to any effect of the Bologna Process implemented in the origin-country. Despite the ability of the estimators to properly compute the BP variables, no significant results emerge from the different estimation. Distance has the expected signs: increasing the distance of 1% reduces the flows of 0.21% in average. GDP and unemployment have no clear effect on peripheral-to-core flows. Indeed, the variables GDP and unemployment are significantly different from 0 in 2 out of 8 cases, but the sign of their coefficient is in line with what one would expect. Joining the Eurozone impacts negatively the outgoing flows of nationals, with a bigger effect than when we take the entire sample (0.24 in average against 0.198 when studying all the bilateral flows). Becoming a member of the European Union leads to broader flows of nationals leaving for another EU countries (0.59 in average when including the NegBin estimates). Consequently, integrating the EU eases the rigidities faced by migrants and supports the existence of the Euro. The Diaspora impacts positively the outgoing flows from peripheral countries, independently from the adopted estimation technique, in similar dimension as with the complete sample. Finally, the Schengen area fosters peripheral-to-core migration in a bigger way than in Table 2, stressing out the importance of already present communities for Central and Eastern Europe migrants.[26]

[26]We estimate this model using variables in first difference with the OLS and SOLS estimators only. Results are shown in Tables 5, 6, 7 and 8 in Appendix.

Table 3: Destination-country specific determinants of Migration in Europe: Peripheral to Core

	OLS		SOLS		PPML		NegBin	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GDP	-0.889	-0.967*	-2.704***	-1.726**	-0.927	-0.889	-0.231*	-0.243*
	(0.555)	(0.524)	(0.944)	(0.735)	(1.382)	(1.408)	(0.136)	(0.145)
Unemployment	-0.708****	-0.705****	-1.328****	-1.069****	-1.306****	-1.326****	-0.123**	-0.123**
	(0.147)	(0.143)	(0.312)	(0.269)	(0.317)	(0.304)	(0.0489)	(0.0496)
Eurozone	0.191	0.196	-0.525*	-0.367	0.263	0.254	-0.0167	-0.0163
	(0.161)	(0.157)	(0.303)	(0.262)	(0.339)	(0.332)	(0.0414)	(0.0416)
EU membership	-0.210	-0.215	-0.635**	-0.288	-0.156	-0.0820	-0.0628	-0.0621
	(0.228)	(0.221)	(0.313)	(0.273)	(0.483)	(0.490)	(0.0497)	(0.0519)
Diaspora	0.763****	0.763****	0.616****	0.620****	0.899****	0.901****	0.121****	0.121****
	(0.0346)	(0.0345)	(0.0914)	(0.0883)	(0.0586)	(0.0579)	(0.00706)	(0.00706)
Schengen	-0.0115	-0.0545	0.0534	-0.398	0.423	0.384	0.0815	0.0730
	(0.201)	(0.197)	(0.241)	(0.279)	(0.360)	(0.342)	(0.0682)	(0.0696)
Common Language	0	0	0	0			0	0
	(.)	(.)	(.)	(.)			(.)	(.)
Distance	-0.0729	-0.0810	-0.398**	-0.398**	0.112	0.117	-0.0206	-0.0222
	(0.0859)	(0.0852)	(0.158)	(0.154)	(0.161)	(0.165)	(0.0194)	(0.0195)
Bologna ind. = 2		0		0		-0.182		-0.0214
		(.)		(.)		(0.118)		(0.0254)
Bologna ind. = 3		-0.0785		0.573***		-0.0707		0
		(0.0706)		(0.216)		(0.160)		(.)
Bologna ind. = 4		-0.114*		-0.297***				0
		(0.0587)		(0.0893)				(.)
Bologna ind. = 5		0		0				-0.0102
		(.)		(.)				(0.0417)
Constant	11.24*	12.25*	36.04***	25.07**	10.42	10.15	3.579**	3.734**
	(6.660)	(6.294)	(12.34)	(9.684)	(16.63)	(16.87)	(1.624)	(1.731)
N	1783	1783	1844	1844	1844	1844	1783	1783
R^2	0.900	0.900	0.621	0.635				
AIC	3603.0	3597.4	6586.0	6517.0	1860324.8	1837767.8	7007.9	7011.1
BIC	4541.1	4546.5	7535.4	7477.5	1861274.2	1838733.7	8116.1	8130.3

Note : the dependent variable for the OLS and the Negative Binomial (NegBin) estimator is ln(inflows) while the SOLS estimator uses ln(scaled inflows) and the PPML one uses inflows. The variables linked to the Bologna Process are 0 when omitted because of collinearity problem. in this sub-sample, common language counts no positive value. Robust standard errors in parentheses, $* : p < 0.1, ** : p < 0.05, *** : p < 0.01, **** : p < 0.001$

Table 4: Origin-country specific determinants of Migration in Europe : Peripheral to Core

	OLS		SOLS		PPML		NegBin	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GDP	-0.0573	-0.0699	-0.113	-0.146	-0.771***	-0.732**	-0.0217	-0.0272
	(0.0979)	(0.0980)	(0.136)	(0.135)	(0.287)	(0.297)	(0.0304)	(0.0321)
Unemployment	0.242*	0.267**	0.173	0.180	0.143	0.223	0.0533	0.0527
	(0.133)	(0.121)	(0.183)	(0.168)	(0.156)	(0.152)	(0.0341)	(0.0362)
Eurozone	-0.372****	-0.340****	-0.331***	-0.279**	-0.191	-0.243	-0.0645**	-0.0559*
	(0.0707)	(0.0745)	(0.121)	(0.117)	(0.170)	(0.186)	(0.0279)	(0.0305)
EU membership	0.524****	0.503****	0.307**	0.285*	1.437****	1.517****	0.0713**	0.0664**
	(0.123)	(0.122)	(0.153)	(0.150)	(0.231)	(0.237)	(0.0295)	(0.0301)
Diaspora	0.728****	0.726****	0.691****	0.686****	0.756****	0.773****	0.117****	0.117****
	(0.0269)	(0.0271)	(0.0525)	(0.0525)	(0.0467)	(0.0427)	(0.00629)	(0.00636)
Schengen	0.666****	0.673****	0.457****	0.436****	0.161	0.194	0.138****	0.140****
	(0.105)	(0.101)	(0.126)	(0.125)	(0.140)	(0.134)	(0.0306)	(0.0316)
Common Language	0	0	0	0			0	0
	(.)	(.)	(.)	(.)			(.)	(.)
Distance	-0.238***	-0.249****	-0.307***	-0.319***	-0.250**	-0.235**	-0.0537***	-0.0549***
	(0.0714)	(0.0733)	(0.0971)	(0.0968)	(0.113)	(0.114)	(0.0183)	(0.0186)
Bologna ind. = 2		-0.233		-0.296				-0.0276
		(0.143)		(0.186)				(0.0536)
Bologna ind. = 3		-0.0542		-0.175**		0.192		-0.00396
		(0.0686)		(0.0798)		(0.219)		(0.0348)
Bologna ind. = 4		-0.0376		-0.114		0.0485		0.00849
		(0.0576)		(0.0843)		(0.211)		(0.0322)
Bologna ind. = 5		0		0		-0.0495		0
		(.)		(.)		(0.237)		(.)
Constant	1.238	1.452	2.866	3.416*	8.824***	7.800**	1.166***	1.232***
	(1.256)	(1.256)	(1.851)	(1.882)	(3.128)	(3.042)	(0.381)	(0.404)
N	1697	1697	1757	1757	1844	1844	1783	1783
R^2	0.266	0.267	0.509	0.508				
AIC	649.8	652.2	1924.6	1930.4	1485089.5	1460040.9	6944.5	6949.8
BIC	1345.7	1364.4	2646.8	2669.0	1485856.7	1460824.7	7800.3	7822.1

Note : the dependent variable for the OLS and the Negative Binomial (NegBin) estimator is ln(inflows) while the SOLS estimator uses ln(scaled inflows) and the PPML one uses inflows. The variable "Bologna ind. = 5" has been omitted in estimations because of collinearity problem, except for the PPML estimator where it is the variable "Bologna ind. = 2" that has been omitted, for similar reason. Robust standard errors in parentheses, $* : p < 0.1, ** : p < 0.05, *** : p < 0.01, **** : p < 0.001$

5. Conclusion

In this paper, we analyze the impact of the Bologna Process in the destination and origin country on migration flows within Europe. We have adopted several econometric methods to estimate a gravity model founded on an income maximisation approach. We first investigate a "global" effect of the Bologna Process implementation in a country and the impact it has on inflows. We then restricted our analysis to a specific couple of countries, "core-periphery", where the Bologna Process may be more crucial from a political demographic and economic point of view.

Our main finding is the limited, if not non-significant, impact of the Bologna Process on bilateral migration. When an effect can be noticed, it can take the form of an increasing function of the level of implementation, meaning that the higher the quality of the implementation, the bigger the migrants flows. This phenomenon is happening when focusing on the implementation of the Bologna Process in the origin country but is absent when studying the level of implementation in the destination country.

Other important results are worth being noticed. GDP has an expected impact in most of the cases, i.e. it increases incoming flows and reduces outgoing flows of migrants. The reverse effect can be noticed about the unemployment: it reduces the incoming flows of migrants and increases the outgoing ones. These results are in line with the literature, as are the effects of diasporas. Focusing on a certain direction of flows (peripheral to core countries), we notice the great importance of diasporas for migration when migrants come from Eastern and Central Europe rather than Western Europe. Common language and distance are traditional factors but seem to have a limited relevance when studying migration in Europe. Regarding the former, a first plausible explanation is the prevalence of English in business and the greater ability of Europeans to speak it. Distance does not play a clear and unmistakable role since it is sensible to the estimator used.

Finally, the impact of the Euro and the EU membership surprise by their nature. A promising extension of our study would be to investigate the specific effects of the Euro and the EU membership on migration. This is left for future research.

6. References

Arpaia, A., Kiss, A., Palvolgyi, B., and Turrini, A. (2016). Labour mobility and labour market adjustment in the eu. *IZA Journal of Migration*, 5(21).

Bartz, K. and Fuchs-Schündeln, N. (2012). The role of borders, languages, and currencies as obstacles to labor market integration. *European Economic Review*, 56(6):1148–1163.

Beine, M., Bourgeon, P., and Bricongne, J.-C. (2019). Aggregate fluctuations and international migration. *The Scandinavian Journal of Economics*, 121(1):117–152.

Beine, M., Docquier, F., and Özden, C. (2009). Diasporas. *CESifo Working Paper*, (2607).

Bertoli, S. and Moraga, J. F.-H. (2013). Multilateral resistance to migration. *Journal of Development Economics*, 102:79 – 100. Migration and Development.

Beyer, R. C. M. and Smets, F. (2015). Labour market adjustments and migration in europe and the united states: how different? *Economic Policy*, 30(84):643–682.

Blanchard, O. and Katz, L. (1992). Regional evolutions. *Brookings Papers on Economic Activity.*, 1:1–75.

Blanchard, O. and Wolfers, J. (2000). The role of shocks and institutions in the rise of european unemployment : The aggregate evidence. *The Economic Journal*, 110(462):1–33.

Bonin, H., Eichhorst, W., Florman, C., Hansen, M. O., Skiöld, L., Stuhler, J., Tatsiramos, K., Thomasen, H., and Zimmermann, K. F. (2008). Geographic mobility in the european union: Optimising its economic and social benefits. *IZA Research Report*, (19).

Borjas, G. J. (1987). Self-selection and the earnings of immigrants. *The American Economic Review*, 77(4):531–553.

Borjas, G. J. (2001). Does immigration grease the wheels of the labor market. *Brookings Papers on Economic Activity*, (1).

Bornhorst, F. and Commander, S. (2006). Regional unemployment and its persistence in transition countries. *Economics of Transition and Institutional Change*, 14(2):269–288.

Bosetti, V., Cattaneo, C., and Verdolini, E. (2015). Migration of skilled workers and innovation: A european perspective. *Journal of International Economics*, 96(2):311 – 322.

Chakrabarti, A. S. and Sengupta, A. (2017). Productivity differences and inter-state migration in the u.s.: A multilateral gravity approach. *Economic Modelling*, 61:156–168.

Chiswick, B. R. (1978). The effect of americanization on the earnings of foreign-born men. *Journal of Political Economy*, 86(5):897–921.

Clemens, M. A. and Pritchett, L. (2019). The new economic case for migration restrictions: An assessment. *Journal of Development Economics*, 138:153 – 164.

Dao, M., Loungani, P., and Furceri, D. (2014). Regional labor market adjustments in the united states and europe. *IMF Working Paper*, 14(26).

de la Rica, S., Glitz, A., and Ortega, F. (2013). Immigration in europe: Trends, policies and empirical evidence. *IZA Discussion Paper*, (7778).

Decressin, J. and Fatás, A. (1995). Regional labor market dynamics in europe. *European Economic Review*, 39(9):1627–1655.

Del Castillo, J. (2016). A class of rum choice models that includes the model in which the utility has logistic distributed errors. *Transportation Research Part B*, 91:1–20.

Docquier, F., Kone, Z. L., Mattoo, A., and Ozden, C. (2019). Labor market effects of demographic shifts and migration in oecd countries. *European Economic Review*, 113:297 – 324.

Fassio, C., Kalantaryan, S., and Venturini, A. (2019). Foreign human capital and total factor productivity: A sectoral approach. *Review of Income and Wealth*, n/a(n/a).

Fischer, L. B. and Pfaffermayr, M. (2018). The more the merrier? migration and convergence among european regions. *Regional Science and Urban Economics*, 72:103 – 114. New Advances in Spatial Econometrics: Interactions Matter.

Fries-Tersch, E., Tugran, T., Rossi, L., and Bradley, H. (2018). 2017 annual report on intra- eu labour mobility.

Hanushek, E. A. and Kimko, D. D. (2000). Schooling, labor-force quality, and the growth of nations. *The American Economic Review*, 90(5):1184–1208.

House, C., Proebsting, C., and Tesar, L. (2018). The benefits of labor mobility in a currency union. Technical Report 876, Society for Economic Dynamics.

Hoxhaj, R., Marchal, L., and Seric, A. (2016). Fdi and migration of skilled workers towards developing countries: Firm-level evidence from sub-saharan africa. *Journal of African Economies*, 25(2):201–232.

Hunt, J. (2006). Staunching emigration from east germany: Age and the determinants of migration. *Journal of the European Economic Association*, 6(5):1014–1037.

Jayet, H. and Marchal, L. (2016). Migration and fdi: Reconciling the standard trade theory with empirical evidence. *Economic Modelling*, 59:46–66.

Jimeno, J. F. and Bentolila, S. (1998). Regional unemployment persistence (spain, 1976–1994). *Labour Economics*, 5(1):25–51.

Kennan, J. (2013). Open borders. *Review of Economic Dynamics*, 16(2):L1 – L13.

Mayer, T. and Zignago, S. (2011). Notes on cepii's distances measures: The geodist database. Working Papers 2011-25, CEPII.

McFadden, D. (1974). Conditional logit analysis of qualitative choice behavior. In Zarembka, P., editor, *Frontiers of Econometrics*, pages 105–142. New York : Academic.

McFadden, D. (1984). Econometric analysis of qualitative response models. In Griliches, Z. and Intriligator, M., editors, *Handbook of Econometrics*, pages 1395–1457. Elsevier, Amsterdam.

Mundell, R. A. (1961). A theory of optimum currency areas. *The American Economic Review*, 51(4):657–665.

Obstfeld, M., Peri, G., and Blanchard, O. J. (1998). Regional non-adjustment and fiscal policy. *Economic Policy*, 13(26):205–259.

OECD (2018). OECD Economic Surveys: European Union.

Ortega, F. and Peri, G. (2013). The effect of income and immigration policies on international migration. *Migration Studies*, 1(1):47–74.

Pedersen, P. J., Pytlikova, M., and Smith, N. (2008). Selection and network effects—migration flows into oecd countries 1990–2000. *European Economic Review*, 52(7):1160 – 1186.

Ravenstein, E. G. (1855). The laws of migration. *Journal of the Statistical Society of London*, 48(2):167–235.

Roy, A. D. (1951). Some thoughts on the distribution of earnings. *Oxford Economic Papers*, 3(2):135–146.

Sanderson, M. R. and Kentor, J. (2008). Foreign direct investment and international migration: A cross-national analysis of less-developed countries, 1985—2000. *International Sociology*, 23(4):514–539.

Santos Silva, J. and Tenreyro, S. (2006). The log of gravity. *Review of Economics and Statistics*, (88).

Tinbergen, J. (1962). Shaping the world economy: Suggestions for an international economic policy. *New York : Twentieth Century Fund*.

Zelinsky, W. (1971). The hypothesis of the mobility transition. *Geographical Review*, 61(2):219–249.

7. Appendix

Table 5: Destination-country specific determinants of Migration in Europe (first difference)

	OLS		SOLS	
	(1)	(2)	(3)	(4)
GDP	3.079****	3.278****	3.111****	3.777****
	(0.396)	(0.400)	(0.394)	(0.419)
Unemployment	0	0	0	0
	(.)	(.)	(.)	(.)
Eurozone	-0.0326***	-0.0233**	0.0255*	0.0670***
	(0.0108)	(0.0118)	(0.0147)	(0.0207)
EU membership	0.0187	0.0274**	0.0222*	0.0816****
	(0.0117)	(0.0123)	(0.0134)	(0.0191)
Diaspora	-0.0408	-0.0472	-0.159*	-0.189**
	(0.0770)	(0.0784)	(0.0879)	(0.0919)
Schengen	0.0511	0.0318	0.0842*	-0.00362
	(0.0426)	(0.0433)	(0.0429)	(0.0450)
Common Language	-0.0422**	-0.0437**	-0.0359	-0.0334
	(0.0180)	(0.0182)	(0.0448)	(0.0451)
Distance	0.00739	0.00925	0.00904	0.0234
	(0.0119)	(0.0122)	(0.0159)	(0.0160)
Bologna ind. = 2		-0.191***		-0.483****
		(0.0580)		(0.0887)
Bologna ind. = 3		-0.0132		-0.171****
		(0.0168)		(0.0330)
Bologna ind. = 4		-0.0436***		-0.212****
		(0.0133)		(0.0342)
Bologna ind. = 5		0		0
		(.)		(.)
Constant	0.183	0.190	0.0989	0.0951
	(0.194)	(0.193)	(0.209)	(0.208)
N	4369	4369	4566	4566
R^2	0.068	0.071	0.008	0.030
AIC	5175.6	5164.8	9293.0	9196.8
BIC	7192.4	7200.7	11323.7	11246.9

Note : the dependent variable for the OLS estimator is $ln(\text{inflows}_t) - ln(\text{inflows}_{t-1})$ while the SOLS estimator uses $ln(\text{inflows}_t + 1) - ln(\text{inflows}_{t-1} + 1)$. The variable "Bologna ind. = 5" and "Unemployment" have been omitted because of collinearity problem. Robust standard errors in parentheses, $* : p < 0.1, ** : p < 0.05, *** : p < 0.01, **** : p < 0.001$

Table 6: Origin-country specific determinants of Migration in Europe (first difference)

	OLS		SOLS	
	(1)	(2)	(3)	(4)
GDP	-0.993****	-0.994****	-1.091****	-1.100****
	(0.197)	(0.197)	(0.226)	(0.227)
Unemployment	0	0	0	0
	(.)	(.)	(.)	(.)
Eurozone	-0.0335***	-0.0350***	-0.0231*	-0.0244*
	(0.0106)	(0.0106)	(0.0126)	(0.0128)
EU membership	0.1000****	0.0999****	0.127****	0.127****
	(0.0142)	(0.0142)	(0.0201)	(0.0203)
Diaspora	-0.200***	-0.202***	-0.171***	-0.174***
	(0.0658)	(0.0664)	(0.0649)	(0.0653)
Schengen	-0.0737****	-0.0702****	-0.0682****	-0.0651****
	(0.0129)	(0.0129)	(0.0170)	(0.0167)
Common Language	0.00489	0.00522	-0.0126	-0.0122
	(0.0162)	(0.0162)	(0.0306)	(0.0309)
Distance	0.0151**	0.0139**	0.00188	0.00134
	(0.00649)	(0.00640)	(0.00781)	(0.00769)
Bologna ind. = 2		-0.000122		0.0132
		(0.0253)		(0.0251)
Bologna ind. = 3		0.0186		0.0145
		(0.0124)		(0.0157)
Bologna ind. = 4		0.00942		0.0111
		(0.0103)		(0.0143)
Bologna ind. = 5		0		0
		(.)		(.)
Constant	0.0190	0.0169	0.0859	0.0796
	(0.0604)	(0.0606)	(0.0656)	(0.0669)
N	4369	4369	4566	4566
R^2	0.433	0.432	0.617	0.617
AIC	2963.7	2968.2	4915.3	4920.6
BIC	4138.1	4161.7	6123.5	6148.1

Note : the dependent variable for the OLS estimator is $ln(\text{inflows}_t) - ln(\text{inflows}_{t-1})$ while the SOLS estimator uses $ln(\text{inflows}_t + 1) - ln(\text{inflows}_{t-1} + 1)$. The variable "Bologna ind. = 5" and "Unemployment" have been omitted because of collinearity problem. Robust standard errors in parentheses, $* : p < 0.1, ** : p < 0.05, *** : p < 0.01, **** : p < 0.001$

Table 7: Destination-country specific determinants of Migration in Europe: Peripheral to Core (first difference)

	OLS		SOLS	
	(1)	(2)	(3)	(4)
GDP	1.880****	2.207****	2.946****	3.743****
	(0.537)	(0.564)	(0.740)	(0.875)
Unemployment	0	0	0	0
	(.)	(.)	(.)	(.)
Eurozone	-0.0515****	-0.0593****	0.00238	0.0498
	(0.0149)	(0.0165)	(0.0220)	(0.0356)
EU membership	-0.00974	-0.00680	-0.00423	0.0455*
	(0.0171)	(0.0182)	(0.0188)	(0.0242)
Diaspora	-0.191	-0.181	-0.392**	-0.451***
	(0.124)	(0.127)	(0.161)	(0.171)
Schengen	0.0285	0.0267	0.0942	-0.0105
	(0.0642)	(0.0648)	(0.0784)	(0.0761)
Common Language	0	0	0	0
	(.)	(.)	(.)	(.)
Distance	0.0122	0.0103	0.0394**	0.0381**
	(0.00881)	(0.00932)	(0.0157)	(0.0152)
Bologna ind. = 2		0		0
		(.)		(.)
Bologna ind. = 3		0.0459		-0.110**
		(0.0314)		(0.0556)
Bologna ind. = 4		-0.0108		-0.179***
		(0.0180)		(0.0542)
Bologna ind. = 5		0		0
		(.)		(.)
Constant	0.320	0.326	-0.0125	0.108
	(0.199)	(0.198)	(0.234)	(0.217)
N	1697	1697	1757	1757
R^2	0.234	0.235	0.040	0.055
AIC	745.2	743.4	3117.5	3091.2
BIC	1653.1	1662.2	4036.7	4021.3

Note : the dependent variable for the OLS estimator is $ln(\text{inflows}_t) - ln(\text{inflows}_{t-1})$ while the SOLS estimator uses $ln(\text{inflows}_t + 1) - ln(\text{inflows}_{t-1} + 1)$. The variable "Bologna ind. = 5" and "Unemployment" have been omitted because of collinearity problem. Robust standard errors in parentheses, $* : p < 0.1, ** : p < 0.05, *** : p < 0.01, **** : p < 0.001$

Table 8: Destination-country specific determinants of Migration in Europe: Peripheral to Core (first difference)

	OLS		SOLS	
	(1)	(2)	(3)	(4)
GDP	-2.152****	-2.103****	-2.108****	-2.091****
	(0.241)	(0.243)	(0.316)	(0.320)
Unemployment	0	0	0	0
	(.)	(.)	(.)	(.)
Eurozone	-0.0766****	-0.0674****	-0.0679***	-0.0645**
	(0.0161)	(0.0166)	(0.0241)	(0.0282)
EU membership	0.155****	0.148****	0.174****	0.172****
	(0.0213)	(0.0217)	(0.0302)	(0.0314)
Diaspora	-0.174	-0.174	-0.222	-0.222
	(0.132)	(0.132)	(0.140)	(0.141)
Schengen	-0.130****	-0.127****	-0.0898***	-0.0895***
	(0.0188)	(0.0191)	(0.0275)	(0.0286)
Common Language	0	0	0	0
	(.)	(.)	(.)	(.)
Distance	0.00104	-0.00138	-0.000427	-0.00142
	(0.00910)	(0.00940)	(0.0102)	(0.0101)
Bologna ind. = 2		-0.0374		-0.0154
		(0.0334)		(0.0412)
Bologna ind. = 3		0.00965		0.00121
		(0.0179)		(0.0295)
Bologna ind. = 4		0.0171		0.00370
		(0.0187)		(0.0321)
Bologna ind. = 5		0		0
		(.)		(.)
Constant	0.174*	0.181*	0.164*	0.170*
	(0.0925)	(0.0968)	(0.0985)	(0.101)
N	1697	1697	1757	1757
R^2	0.266	0.267	0.509	0.508
AIC	649.8	652.2	1924.6	1930.4
BIC	1345.7	1364.4	2646.8	2669.0

Note : the dependent variable for the OLS estimator is $ln(\text{inflows}_t) - ln(\text{inflows}_{t-1})$ while the SOLS estimator uses $ln(\text{inflows}_t + 1) - ln(\text{inflows}_{t-1} + 1)$. The variable "Bologna ind. = 5" and "Unemployment" have been omitted because of collinearity problem. Robust standard errors in parentheses, $* : p < 0.1, ** : p < 0.05, *** : p < 0.01, **** : p < 0.001$

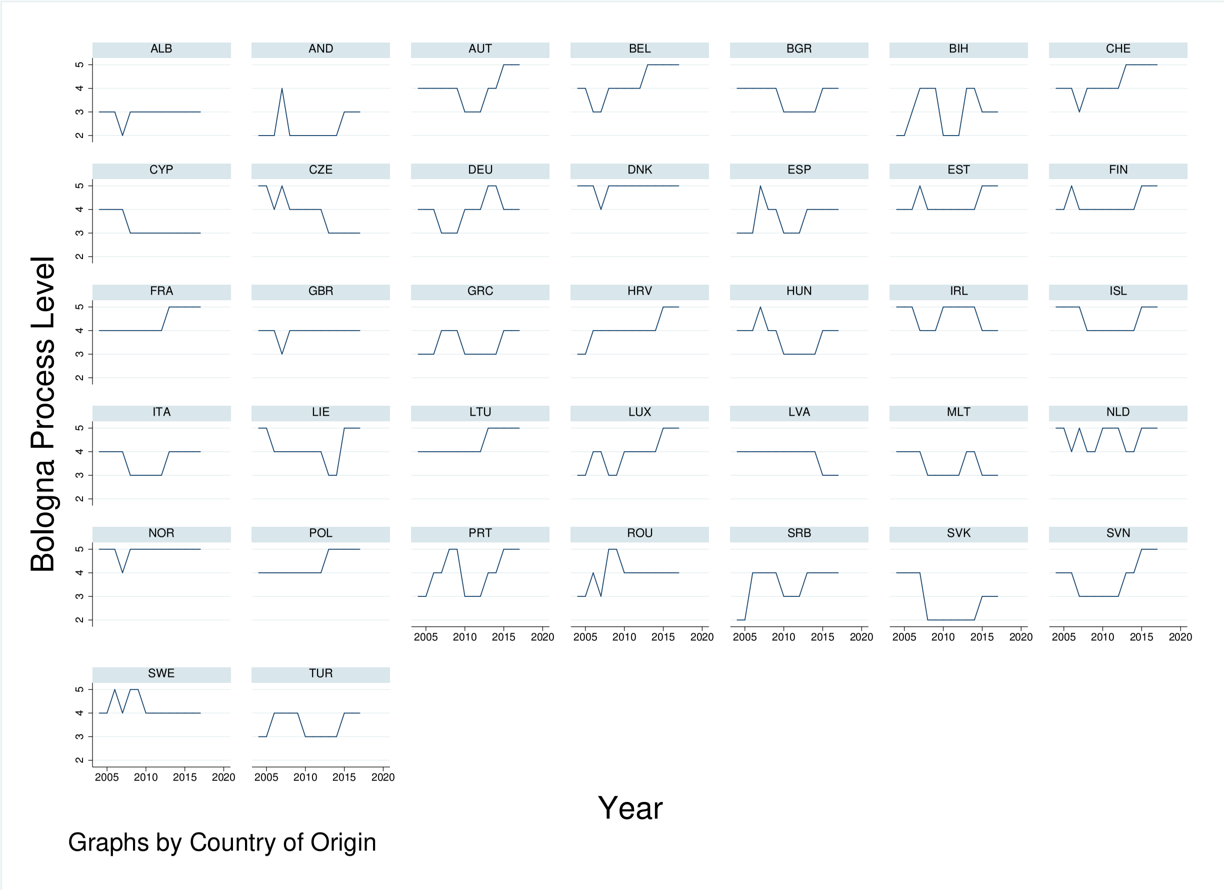
Table 9: Value of the Bologna Process

Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
ALB	3	3	3	2	3	3	3	3	3	3	3	3	3	3
AUT	4	4	4	4	4	4	3	3	3	4	4	5	5	5
BEL	4	4	3	3	4	4	4	4	4	5	5	5	5	5
BIH	2	2	3	4	4	4	2	2	2	4	4	3	3	3
CHE	4	4	4	3	4	4	4	4	4	5	5	5	5	5
CYP	4	4	4	4	3	3	3	3	3	3	3	3	3	3
CZE	5	5	4	5	4	4	4	4	4	3	3	3	3	3
DEU	4	4	4	3	3	3	4	4	4	5	5	4	4	4
DNK	5	5	5	4	5	5	5	5	5	5	5	5	5	5
ESP	3	3	3	5	4	4	3	3	3	4	4	4	4	4
EST	4	4	4	5	4	4	4	4	4	4	4	5	5	5
FIN	4	4	5	4	4	4	4	4	4	4	4	5	5	5
FRA	4	4	4	4	4	4	4	4	4	5	5	5	5	5
GBR	4	4	4	3	4	4	4	4	4	4	4	4	4	4
HRV	3	3	4	4	4	4	4	4	4	4	4	5	5	5
HUN	4	4	4	5	4	4	3	3	3	3	3	4	4	4
IRL	5	5	5	4	4	4	5	5	5	5	5	4	4	4
ISL	5	5	5	5	4	4	4	4	4	4	4	5	5	5
ITA	4	4	4	4	3	3	3	3	3	4	4	4	4	4
LIE	5	5	4	4	4	4	4	4	4	3	3	5	5	5
LTU	4	4	4	4	4	4	4	4	4	5	5	5	5	5
LUX	3	3	4	4	3	3	4	4	4	4	4	5	5	5
LVA	4	4	4	4	4	4	4	4	4	4	4	3	3	3
MLT	4	4	4	4	3	3	3	3	3	4	4	3	3	3
NLD	5	5	4	5	4	4	5	5	5	4	4	5	5	5
NOR	5	5	5	4	5	5	5	5	5	5	5	5	5	5
POL	4	4	4	4	4	4	4	4	4	5	5	5	5	5
PRT	3	3	4	4	5	5	3	3	3	4	4	5	5	5
ROU	3	3	4	3	5	5	4	4	4	4	4	4	4	4
SRB	2	2	4	4	4	4	3	3	3	4	4	4	4	4
SVK	4	4	4	4	2	2	2	2	2	2	2	3	3	3
SVN	4	4	4	3	3	3	3	3	3	4	4	5	5	5
SWE	4	4	5	4	5	5	4	4	4	4	4	4	4	4
TUR	3	3	4	4	4	4	3	3	3	3	3	4	4	4

Table 10: Descriptive statistics - Peripheral-Core Migration

Variable	*Count*	*Mean*	*Std. dev.*	*Min*	*Max*
inflows	4675	2508.975	9378.665	1	192172
scaled inflows	4675	2509.975	9378.665	2	192173
ln(inflows)	4675	5.812134	2.161366	0	12.16615
ln(scaled inflows)	4675	5.836344	2.118347	.6931472	12.16615
ln(first difference inflows)	4675	.0638773	.4502899	-2.456736	5.220356
ln(first difference scaled inflows)	4675	.0614008	.417284	-2.414289	4.532599
ln(GDP per capita)	4675	10.63837	.4786719	9.439443	11.56423
ln(first difference GDP per capita)	4675	.0092938	.0254838	-.088975	.068573
ln(unemployment)	4675	1.920208	.4735183	.8113745	3.261705
ln(first difference unemployment)	4675	.0092938	.0254838	-.088975	.068573
Eurozone	4675	.551016	.4974438	0	1
Schengen	4675	.9610695	.19345	0	1
EU membership	4675	.8085561	.3934796	0	1
ln(Distances)	4675	7.034339	.7115011	4.087945	8.324355
Common off. language	4675	.0539037	.2258518	0	1
Stock of foreign-born migrants	4675	8.238437	2.268727	2.302585	14.22828
Bologna ind. = 1	4675	0	0	0	0
Bologna ind. = 2	4675	.0175401	.1312865	0	1
Bologna ind. = 3	4675	.1516578	.3587272	0	1
Bologna ind. = 4	4675	.4660963	.4989026	0	1
Bologna ind. = 5	4675	.3647059	.4813991	0	1

Figure 10: Evolution by country of the Bologna Process Indicator



Source : Bologna Process Stocktaking Reports