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ORIGINAL RESEARCH

"It's the Economy, Stupid!": On the Relative Impact of Political and Economic Determinants on Migration

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Abstract
The present study empirically analyzes determinants of immigration to EU member countries for the period 1998–2016. By performing PPML regression, it investigates the dynamics of different political and economic determinants. In general, there are two opposing effects: better living conditions in the origin country increase the feasibility of migration (feasibility hypothesis), but they also decrease international differentials, thus diminishing the incentive to migrate (incentive hypothesis). Indeed, better economic conditions in the origin country ease the budget constraints of potential migrants and thereby stimulate emigration to EU countries (feasibility hypothesis). At the same time, the income differential between destination and origin country is also positively related to migration, supporting the incentive hypothesis. Contrary to these findings about economic determinants, the impact of political determinants is only robust in one direction, for migration from outside the EU. Here, worse political conditions in the origin country increase the need to migrate, causing flight migration (need hypothesis). Altogether, economic determinants appear to outweigh political factors.

Keywords Determinants of migration · International migration · Refugees · Gravity model of migration

Introduction

> Bad or oppressive laws, heavy taxation, an unattractive climate, uncongenial social surroundings, and even compulsion (slave trade, transportation), all have produced and are still producing currents of migration, but none of these currents can compare in volume with that which arises from the desire

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> inherent in most men to 'better' themselves in material respects. (Ravenstein 1889, p. 286)

> When migrants reach European shores, they need to demonstrate of which type they are: of the type that is running away from political violence or of the type that is escaping economic misfortunes. (Apostolova 2016, p. 34)

International migration has rapidly gained importance in recent years due to major migration flows. In 2017, there was a global migrant stock consisting of 258 million persons, 78 million of whom were living in Europe (UNPD 2017b, p. 4 et seq.). In particular, immigration to the European Union (EU) has recently gained considerable attention due to the so-called refugee crisis in 2015 that led to an all-time peak in immigration to Europe. This induced an intensive debate in the media and in politics concerning the issue of whether the new immigrants were "economic migrants" or "refugees" (see e.g. Apostolova 2016; Hatton 2016; Tétényi et al. 2018). Although the incentives to migrate can hardly be seen in isolation, this debate poses a frequently analyzed question in migration economics: How important are the different determinants of migration?

When looking at two of Europe's most populated countries, France and Germany, immigration into the EU is highly varied: in 2016, whereas in France immigrants mainly came from former colonies in Africa or neighboring countries (see Fig. 1), immigrants in Germany came from (South-) Eastern Europe and the Middle East (see Fig. 2). What the migratory flows to France and Germany have in common is their relatively short distances; however, these flows into the EU are coming from rich industrialized countries as well as from poor countries or countries at war. A fundamental question is whether these flows are driven by politics or economics.

The most influential approach in migration economics is probably the human capital model of migration, following the work of Sjaastad (1962). According to that, migration can be viewed as an investment decision: an individual decides to migrate if the net present value of a future rise in incomes outweighs the costs of migration. Although Sjaastad (1962) mainly focuses on monetary costs and returns, this approach can actually be expanded to other considerations: people migrate if they can improve their living conditions in general, i.e., if the additional *utility* derived from higher incomes, more civil or political liberties, greater political stability, as well as the absence of violence and terrorism in the country of destination exceeds migration costs.

The incentives, such as those mentioned above, that factor into immigration decisions have been investigated extensively. The different determinants of migration can be assigned to four groups: 1. economic factors, 2. political factors, 3. dyadic factors, 4. personal factors. Whereas economic and political factors are defined for a whole country, so-called dyadic factors are defined for pairs of countries and mainly consist of measures of distance and proximity. Finally, personal factors are defined on a micro-level.

There is an extant empirical literature on all of the aforementioned determinants. Characteristics of the origin country that lead to higher emigration are, e.g., corruption (Dimant et al. 2013; Cooray and Schneider 2016; Poprawe 2015),

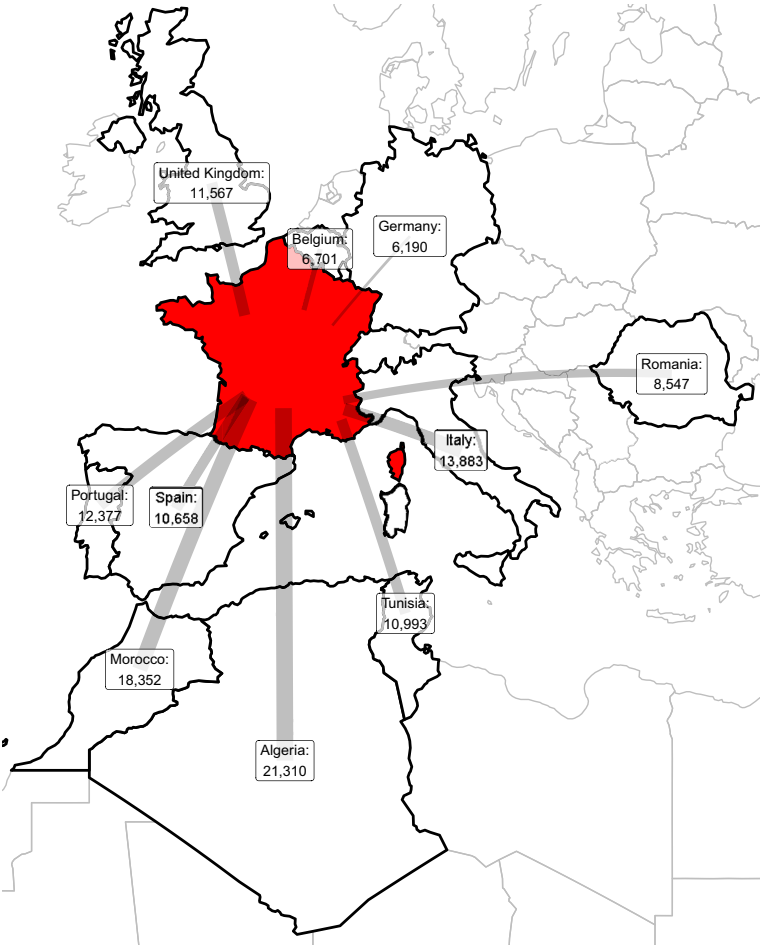

Fig. 1 Top 10 origin countries of immigrants to France in 2016. *Source:* Eurostat (2019a, b, c), OECD (2019), own illustration

terrorism (Dreher et al. 2011), and political conditions (Vogler and Rotte 2000), but also income (Mckenzie and Rapoport 2007; Clemens 2014), unemployment (DaVanzo 1978; Niedomysl and Hansen 2010), and meteorological conditions (Feng et al. 2010; Feng and Oppenheimer 2012; Massey et al. 2010; Tan 2017; Khandker et al. 2012; Beine and Parsons 2015). Characteristics of the destination country that stimulate immigration are, e.g., immigration policy (Ortega and Peri 2013; Bartram 2010; Hanson and Spilimbergo 1999; Pedersen et al. 2008), the welfare state (Borjas 1999), immigrant networks (Kaplan et al. 2016; Carrington et al. 1996; Beine et al. 2011), and income (Burda et al. 1998; Collier 2015; Hanson and Spilimbergo 1999; Liebig and Sousa-Poza 2004; Ortega and Peri 2013;

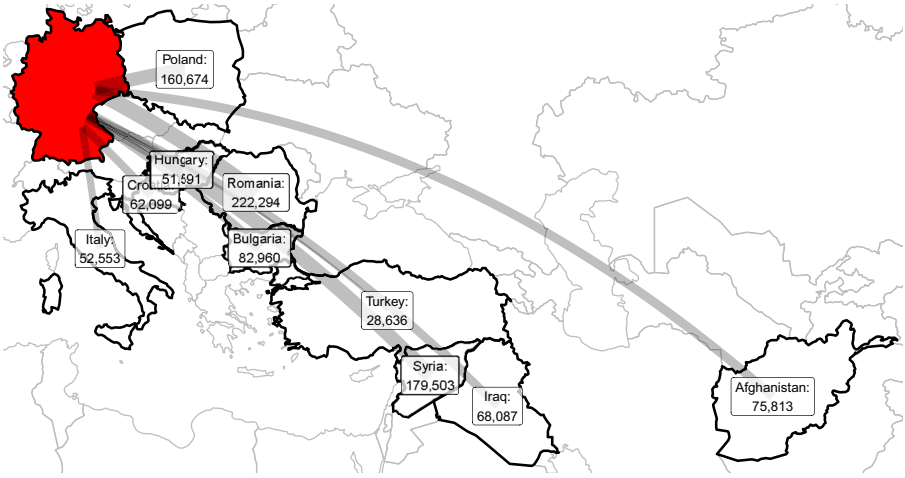

Fig. 2 Top 10 origin countries of immigrants to Germany in 2016. *Source:* OECD (2019), own illustration

Stark and Taylor 1989).[1] While the direction of action is often (but not always!) intuitively clear, it is *a priori* not obvious which motives weigh heavily and which are relatively unimportant in the decision to migrate.[2][3]

To address this issue, the present study analyzes immigration data from Eurostat (2019a, b, c) and OECD (2019) broken down by origin country in the period 1998–2016. Countries of destination are the 28 member states of the EU, but

[1] A common classification of these characteristics is that of push and pull factors (Lee 1966, p. 50): while the push factors are usually negative properties of the origin country and thereby affect the "supply side" of migration, pull factors are positive properties of the destination country which affect the "demand side" of migration.

[2] Furthermore, the impact of dyadic variables has also been extensively investigated, beginning with the work of Sjaastad (1962), especially considering diasporas which are assumed to reduce migration costs (Carrington et al. 1996; Beine et al. 2011). In addition and independent of these country (-pair)-specific determinants, individual-specific determinants can be investigated such as a "migrant personality" (Boneva et al. 1997, 1998; Boneva and Frieze 2001; Matter 1977), demographic factors including age (Greenwood 1975; Schwartz 1973) and gender (de Jong 2000), education (Borjas 1987, 1989, 1991; Chiswick 1999; Faggian et al. 2007; Ivlevs 2013; Ivlevs and King 2012; Bartel 1989; Schwartz 1973), and culture (Belot and Ederveen 2012), especially the impact of Islam on migration (Falco and Rotondi 2016a, b). However, micro data are needed for the investigation of these determinants, and, as the present study is a macro analysis, they are not the focus here.

[3] Determinants of migration additionally depend on migrants' skill level: an extensive strand of literature exists regarding the empirical analysis of the determinants of particularly skilled migration into OECD member countries finding network effects (Pedersen et al. 2008) and investigating the relevance of immigration policy (Brücker and Defoort 2009; Brücker et al. 2012; Czaika and Parsons 2017), natural disasters (Drabo and Mbaye 2015), and anti-immigrant attitudes (Gorinas and Pytliková 2017). Other empirical studies estimate the relative importance of dyadic variables and economic incentives as well as immigration policy (Belot and Hatton 2012), or the effect of economic freedoms (Meierrieks and Renner 2017) compared to that of political institutional quality (Nejad and Young 2016). However, the present study does not distinguish between migrant groups (neither by gender nor by age or skill level).

there are no detailed data for three countries and a substantial number of missing observations for others. Countries of origin are 195 independent countries listed in the Worldbank (2017c) database. The conceptual starting point is the fact that people do not inevitably migrate simply because they have an *incentive* to do so—as the human capital model of migration suggests—but they do as soon as migration is also *feasible*. For example, budget constraints are binding in the presence of imperfect capital markets and could prevent an otherwise profitable migration. Thus, people in poorer countries are often unable to finance migration costs in advance and do not decide to migrate although high international income inequality is a large incentive to migrate. This might also hold true for political determinants: A free and democratic society is attractive for (potential) migrants from illiberal and authoritarian countries, but these people are often politically forced to reside in their origin country. Thus, the net effect of poor living conditions in the origin country is not unambiguous and has to be analyzed empirically.

Three hypotheses are derived: firstly, the *feasibility* hypothesis states that better conditions in the origin country increase migration. Secondly, the *need* hypothesis states the opposite. Finally, the *incentive* hypothesis states that higher international differentials induce larger migration. The impact of these factors is analyzed and estimated in the framework of a gravity model, which is common in the appropriate literature (Anderson 2011; Beine et al. 2016a; Vanderkamp 1977; Karemera et al. 2000). In order to test these hypotheses, I employ a Poisson pseudo-maximum likelihood (PPML) estimation approach with fixed effects (FE), which has been applied in previous migration studies (Beine et al. 2011; Beine and Parsons 2015; Belot and Ederveen 2012; Poprawe 2015). The sample is split into migration from outside the EU (sub-sample I) and within the EU (sub-sample II), as migrants' motives might differ depending on the region of origin. Finally, I use standardized coefficients in order to define the relative impact of economic and political determinants.

For economic determinants, the results for both sub-samples support the feasibility hypothesis: higher incomes in the origin country are positively related to migration. However, political determinants are only robust and significant in sub-sample I, and they support the need hypothesis: these migrants appear to be forced to migrate once violence and political terror take over in the origin country, and there appears to exist a significant share of refugees among immigrants from outside the EU. For both economic and political determinants, the incentive hypothesis can be confirmed. However, within the EU, the variance in political conditions is not large enough, so the results are not robust. Altogether, economic determinants and especially GDP per capita are much more able to explain international migration flows than political determinants.[4]

This study is closely related to other empirical works. Karemera et al. (2000) exhibit a methodically comparable design, but they use different countries of destination—the United States of America (USA) and Canada—and a different investigation period (1976–1986). Gallardo-Sejas et al. (2006) investigate motives of European immigrants, but they only analyze cross-sectional data of 139 origin and

[4] A similar result was also found in the analysis of asylum seeker statistics only (Migali 2018, p. 101).

13 destination countries from the year 2000. Grau and López (2017) also analyze immigration to the EU but for a shorter period (2000–2014) and not using a PPML approach. In addition, they do not include political determinants. Cuaresma et al. (2013) try to estimate the expected immigration to Europe in the coming decades. However, they only use net immigration data of the years 2000–2005. Finally, Migali (2018) infers the size of bilateral migration flows by differencing migrant stock data[5] and analyzes the relative importance by calculating standardized coefficients. All the same, they also use loglog estimation. Given all of these previous works, the present empirical study is unique in disentangling the impact of political and economic determinants for both immigration from outside and within the EU using a PPML model. It provides a series of robustness checks using different indicators and includes a very comprehensive dataset. It therefore yields valuable and systematic insights to the motives of immigrants in Europe. Furthermore, it joins the scientific debate on the distinction between "economic migrants" and "genuine refugees" (Neumayer 2005; Moore and Shellman 2007; Apostolova 2016; Tétényi et al. 2018).

The paper is structured as follows: "Hypotheses" section derives three hypotheses for the empirical investigation and formally illustrates them in the context of a gravity model. "Data" section describes the data, while "Methodology and Specification" section describes the methodology and establishes the specification of the empirical model. "Regression Results" section describes the results. "Discussion" section discusses some methodological issues, interprets the results, and discusses potential limitations, and "Conclusion" section concludes.

Hypotheses

Gravity models of migration assume that a migration flow M_{ijt} from origin country i to destination country j at time t can generally be described with a gravity equation (Zipf 1946):

$$M_{ijt} = \alpha \frac{P_{it}^{\beta} P_{jt}^{\gamma}}{D_{ij}^{\delta}}, \tag{1}$$

where P_{it} is the origin country's population, P_{jt} is the destination country's population, and D_{ij} is the time-invariant distance between these two countries. α, β, γ, and δ are parameters to be estimated which can be interpreted as the respective elasticities of migration or "migration impact elasticities" (Karemera et al. 2000, p. 1746). If, for example, the population of the origin country *ceteris paribus* increases by one

[5] Although some other empirical studies (Beine et al. 2011; Abel and Sander 2014; Abel 2018) also rely on differencing stock data, differences in migrant stocks need not equal migration flows. This finding might yield biased results since the development of the migrant stock does not only depend on immigration, but also on emigration (return migration) and mortality of the migrant stock.

percent, the migration to j increases by approximately β percent. On the contrary, we will expect that a migration flow starting in an origin country which is one percent further away than another is about δ percent lower.

However, it is not compelling that the gravity model of migration—as a reference to Newtonian physics—is able to explain migration flows not only empirically, but also in theory. In empirical studies, the gravity model usually fits migration data well (Karemera et al. 2000; Anderson 2011; Poprawe 2015; Ramos and Suriñach 2017). In theory, a number of attempts exist to derive the gravity formula as an aggregate resulting from individual (random) utility maximization (McFadden 1974; Anderson 2011; Beine et al. 2011; Grogger and Hanson 2011; Beine et al. 2016a). Interestingly, the gravity model can thus be interpreted as the manifestation of an economic law in the case of international migration.

The underlying relation in Eq. (1) can be generalized so that the respective populations in the numerator are substituted by migration stimulating characteristics of the origin and destination countries (Karemera et al. 2000). Thus, it is reasonable that a set of political and economic factors is multiplicatively linked and add to the gravity equation of migration. It is plausible that a country is being considered as a destination for migration only if it is leading in at least some factors compared to the origin country. Therefore, the characteristics of the destination country are related to the characteristics of the origin country. For p characteristics we get the following relationship:

$$M_{ijt} = \alpha \frac{\prod_p X_{ipt}^{\beta_p} R_{ijpt}^{\gamma_p}}{D_{ij}^{\delta}}, \tag{2}$$

where $R_{ijpt} = \frac{X_{jpt}}{X_{ipt}}$ is the ratio of the p-th characteristic of the destination country and the corresponding value in the origin country. α, β_p, γ_p, and δ ($\forall p$) are still coefficients to be estimated.

Taking logs yields the result that log migration is a linear combination of the determinants:

$$m_{ijt} = \alpha + \sum_p (\beta_p x_{ipt} + \gamma_p r_{ijpt}) - \delta d_{ij}, \tag{3}$$

where the lower case variables are the logs of the corresponding upper case variables and $r_{ijpt} = x_{jpt} - x_{ipt}$. The characteristics of the origin country are x_{ipt}, whereas r_{ijpt} are the relative improvements in the destination countries compared to the conditions in the origin country. Two effects work in (possibly) opposite directions and can thus be observed: for one thing, better economic conditions in the origin country improve the financial *feasibility* of migration and ease the individuals' budget constraint, but then again they decrease the *incentive* to migrate by reducing the international income differential (Faini and Venturini 1993; Vogler and Rotte 2000;

Mckenzie and Rapoport 2007; Clemens 2014).[6] By estimating Eq. (3), it is possible to decompose the impact of income in the origin country into a direct and indirect effect and to derive the overall effect by estimating β_p against γ_p. Analogously, this can be also applied to political conditions: the more oppressive the government of an origin country, the higher are the political barriers to emigration[7], whereas the incentive to migrate increases due to less potential for improvements. Not only because autocratic, fragile, and violent regimes will produce worse travel conditions, it should be plausible that the *feasibility* to migrate is expected to decrease with war, violence, political instability, and autocracy, i.e., worse political conditions. Therefore, Hypothesis 1a can be formulated as follows.

Hypothesis 1a: Feasibility. If the economic/political conditions in the origin country improve, the travel conditions will also improve, thereby exerting upward pressure on emigration because economic/political restrictions loosen ($\beta_p > 0$).

However, the *need* to escape from poverty or bad political conditions in the origin country might increase regardless of whether there are possible destination countries which are more attractive. In this case, one might refer to *flight migration* as being when the migration decision is not made primarily to improve living conditions in the destination country but to escape from unacceptable conditions in the origin country. Therefore, Hypothesis 1b follows as an alternative.

Hypothesis 1b: Need. If the economic/political conditions in the origin country improve, the need to escape will shrink, thereby exerting downward pressure on emigration ($\beta_p < 0$).

[6] The cited studies assume an inverted U-shaped relationship between income in the origin country and the migration flow. Please note that in the current model, the two effects add up to either a positive or a negative overall effect—either the two effects unambiguously balance each other out or one is stronger than the other. This holds irrespective of the income level.

In this analysis, I refrain from including the squared GDP of the origin country for two reasons: *firstly*, the number of the variables of interest increases and the comparative analysis of economic and political coefficients is much more complicated, if not impossible. Methodologically, it is not trivial to compare the relevance of a non-linear impact (of GDP) with that of a linear impact (e.g., of a political indicator). *Secondly*, an inverted U-shaped relationship can only be found for longer time series and is particularly hard to find once between-group variance in incomes is controlled away (Clemens 2014, p. 166). The present study only investigates a 19-year period and includes country(-pair) FE. Hence, the coefficient of squared GDP would not be reasonable to interpret.

[7] This is at least to some extent documented by empirical studies: for example, Karemera et al. (2000) find that the restriction of civil liberties and political rights substantially decreases migration. A prominent historical example of politically restricted emigration is the case of German Democratic Republic (GDR): on the one hand, when the government became more and more authoritarian—and not least after the construction of the Berlin Wall in 1961—emigration declined significantly. On the other hand, emigration increased dramatically once the regime began to adopt reforms and to open the Wall in 1989 (Hirschman 1993). This is not to say that any additional limitation of civil liberties and/or any additional loss of political stability automatically leads to greater emigration barriers, but that authoritarian regimes are often likely to also restrict the freedom of movement (at least to some parts of the population) and that people face not only economic but also political restrictions when considering whether to migrate or not.

The effect stated in Hypothesis 1b is the opposite of Hypothesis 1a. In practice, both effects are likely to occur and may (partly) compensate each other, but the present analysis will test which effect prevails. If empirical analysis finds support for one of these hypotheses, it does not automatically mean that the other one is wrong but that the former more than offsets the latter. As a consequence, the *net* effect of bad political and economic conditions on migration is not unambiguous *a priori*.

In any case, one should expect that migration increases as soon as the *incentive* to migrate increases. This incentive is measured by a differential in economic and/or political conditions between the destination and the origin country. Hypothesis 2 follows.

Hypothesis 2: Incentive. If the differential in economic and/or political conditions in the destination and origin country increases, the incentive to migrate and thus migration itself will increase ($\gamma_p > 0$).

Data

The present study focuses on the analysis of immigration into EU member countries. For this purpose, annual immigration data of the 28 member states have been collected, and are broken down by the origin country of immigrants.

Several international organizations have gathered bilateral migration data on a large scale. These data include the International Migration Database of OECD (2019), the database of the statistical office of the European Community (EC) (Eurostat 2019c), Worldbank (2017b) figures, in particular its Global Bilateral Migration Database (Worldbank 2017a), and records of the United Nations (UN) (see for an overview Henning and Hovy 2011; UNPD 2016; UNSD 2017). However, these databases also have major shortcomings. Firstly, UN data only contain migration data on certain groups of migrants[8] or only stock data rather than flow data (UNPD 2017a).[9] Secondly, Worldbank data only consist of bilateral migration matrices for the years 1960, 1970, 1980, 1990, 2000, 2010, and 2013, respectively.

For these reasons, I rely on the datasets provided by Eurostat (2019c) and OECD (2019). As Eurostat data begin in the year 1998, I only analyze immigration within the period 1998–2016. Even so, Eurostat data do not include asylum seekers for some countries and refugees for Cyprus. Analyzing immigration figures without accounting for this issue would therefore yield biased results. As a consequence, I add data on asylum seekers for the countries concerned (Eurostat 2019a, b).

The datasets include 47,162 and 49,866 observations for this period, respectively. Each observation is defined by the pair of the origin and destination country and

[8] These include figures on labor migration by International Labour Organisation (2017) and figures on refugees and displaced persons by UNHCR (2017).

[9] See Footnote 5 on why differencing stock data may be inappropriate for analyzing the determinants of migration *flows*.

the year.[10] The data, including 195 origin countries[11], 28 destination countries and 19 years and subtracting data from years in which certain destination countries were not yet members of the EU, yield a total of 85,166 possible observations. As can be seen in Tables 1 and 2, there are no data available in the Eurostat (2019c) dataset for Cyprus, Greece, Malta, and the UK, and there are huge gaps for Belgium, France, Germany, Ireland, Italy, Latvia, Poland, and Portugal. The OECD (2019) database has more data available for the large countries of the EU (i.e., France, Germany, Italy, Spain, and the UK), but some countries do not appear, as they were not members of the OECD in the period under consideration (Bulgaria, Croatia, Cyprus, Lithuania, Malta, Romania). As OECD data are more complete, I rely on this dataset and fill the gaps with (combined) Eurostat data where possible. Consequently, data availability improves, as can be seen in Table 3: the merged dataset contains 61,993 observations (72.8%). However, some major gaps remain with less than 50 observations per year and destination country.[12] Furthermore, I include data on migrant stocks from Eurostat (2019d).

The present dataset cannot be used to measure the total inflow of immigrants into the EU.[13] However, because considerable data are available for the large countries, the merged dataset is suitable for analyzing the determinants of most of the immigration to EU countries.

In order to analyze these determinants, I add economic indicators from the World Development Indicators (WDI) of Worldbank (2017c), including population data, GDP per capita (measured in constant 2010 US$), and the ILO estimate for the unemployment rate.

There are many indicators measuring good governance and political aspects. For the sake of the current analysis, it is most useful to find a measure of violence, political instability, and the degree of liberality, as these are most commonly assumed determinants of international migration flows. In particular, they appear to play a major role for international refugees and their decision to move to other countries. Most indicators have been calculated for longer periods, but not for all countries in the world. In the current analysis, three indicators are used: an indicator for *Political Stability and Absence of Violence/Terrorism* from the Worldwide Governance

[10] Please note that the origin country is defined by the immigrant's nationality and is not necessarily the country in which migration started.

[11] The list of origin countries is extracted from Worldbank (2017c). Dependent territories such as Overseas territories of the United Kingdom (UK) or special administrative regions of PR China are excluded from the analysis.

[12] Belgium 1998–2006, Bulgaria 2008–2011, Cyprus, Greece, Ireland 1998–2005 and 2011–2016, Italy 1998 and 2001, Latvia 2004–2005, 2007, 2011–2013 and 2016, Malta, Portugal 1998–2007 and 2009–2016, Romania 2007, UK 2002–2010 and 2016.

[13] In any case, for this purpose, one has to subtract intra-EU migration because simply adding up immigration figures would overestimate total immigration to the EU. Even when accounting for that, immigration would be overestimated since multiple migration (within a year) could not be ruled out. On the other hand, immigration is underestimated because of the data gaps. Therefore, the sum of the national immigration figures cannot be interpreted as either the lower or the upper bound of total immigration to the EU.

Table 1 Availability of detailed Eurostat (2019c) immigration data (observations per year and destination country)

Country	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
BE	n/a	1	n/a	n/a	n/a	1	n/a	n/a	n/a	92	n/a	n/a	191	192	192	192	192	192	192
DE	186	186	n/a	186	187	189	189	188	190	191	191	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
FR	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	25	25	25	25
IT	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	191	191	191	192	192	192	192	192	192
LU	186	186	186	187	187	190	190	190	190	190	191	191	191	192	192	192	192	192	192
NL	187	187	187	187	187	188	188	163	166	166	170	191	191	192	192	192	192	192	192
DK	187	187	187	187	187	188	183	186	187	153	191	191	191	192	192	192	192	192	192
IE	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	191	191	191	191	191	n/a	n/a	n/a	n/a	n/a	n/a
GB	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
GR	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
PT	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	113	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
ES	187	187	187	187	187	n/a	188	189	190	187	69	69	69	69	69	69	69	50	51
FI	187	187	188	188	187	188	188	188	190	190	191	191	191	192	192	192	192	192	192
AT	187	187	n/a	187	186	186	186	186	186	192	192	1	1	192	192	n/a	192	192	192
SE	187	187	187	187	187	188	188	188	190	190	165	164	167	192	192	192	192	192	192
EE							190	190	190	190	191	191	191	192	192	192	192	192	192
LV							n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	192	n/a	n/a
LT							188	188	190	190	191	191	191	192	192	192	192	192	192
MT							n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
PL							n/a	n/a	89	190	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
SK							n/a	n/a	n/a	n/a	191	191	191	192	192	192	192	192	192
SI							188	188	190	190	191	191	191	192	192	192	192	192	192
CZ							188	188	190	190	191	191	134	133	192	192	192	192	192
HU							188	190	190	190	138	138	192	192	192	192	192	192	192
CY							n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BG										190	n/a	n/a	n/a	n/a	192	192	192	192	192
RO										n/a	192	192	192	192	192	192	192	192	192
HR																192	192	192	192

Table 2 Availability of detailed OECD (2019) immigration data (observations per year and destination country)

Country	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
BE	18	29	32	32	32	32	32	32	32	32	179	181	176	104	172	174	175	174	173
DE	190	190	190	190	190	190	190	190	190	190	191	191	191	191	191	191	191	191	116
FR	193	193	193	193	193	193	193	193	194	194	194	194	194	194	194	194	194	190	191
IT	28	187	187	29	188	191	191	191	191	191	192	192	192	192	191	190	173	192	179
LU	192	192	192	192	193	193	193	193	193	194	194	194	194	194	194	194	194	194	194
NL	15	15	157	157	157	157	157	157	157	158	158	167	169	171	167	176	173	180	182
DK	173	173	173	173	173	173	173	173	173	173	173	173	157	144	177	189	193	194	194
IE	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1
GB	102	102	102	102	21	18	19	17	19	19	21	26	28	62	67	67	72	68	21
GR	35	n/a	n/a	n/a	n/a	n/a	n/a	7	7	7	7	7	7	7	n/a	n/a	n/a	n/a	n/a
PT	16	16	16	23	23	23	24	24	24	24	28	28	28	28	28	28	28	28	28
ES	193	193	193	193	193	193	193	193	193	193	194	194	194	194	194	194	192	192	192
FI	193	193	193	194	194	194	194	194	194	194	194	194	194	194	194	194	194	194	194
AT	189	189	189	189	188	188	189	189	189	191	191	191	191	191	191	191	194	194	194
SE	29	29	190	190	194	194	194	194	194	194	194	194	194	194	194	194	194	194	192
EE							191	191	191	191	193	193	193	194	194	194	194	194	194
LV							n/a	42	52	48	50	50	53	n/a	n/a	7	n/a	193	n/a
LT							n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MT							n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
PL							60	87	73	87	88	193	193	193	194	194	194	194	194
SK							122	151	189	191	193	125	133	115	85	87	83	90	83
SI							n/a	n/a	n/a	82	100	104	93	92	84	103	90	113	96
CZ							142	141	141	147	143	141	135	132	139	140	149	141	136
HU							194	194	194	194	194	194	194	194	194	194	194	194	194
CY							n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BG										n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
RO										n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
HR																n/a	n/a	n/a	n/a

Table 3 Total availability of detailed immigration data (observations per year and destination country)

Country	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
BE	18	29	32	32	32	33	32	32	32	94	179	181	193	194	194	194	194	194	194
DE	191	191	190	191	191	191	191	191	193	193	193	191	191	191	191	191	191	191	116
FR	193	193	193	193	193	193	193	193	194	194	194	194	194	194	194	194	194	190	191
IT	28	187	187	29	188	191	191	191	191	191	193	193	193	194	194	194	194	194	194
LU	192	192	192	192	193	194	194	194	194	194	194	194	194	194	194	194	194	194	194
NL	189	189	190	190	190	190	190	171	174	174	178	193	193	194	194	194	194	194	194
DK	192	192	192	192	191	192	188	190	190	174	193	193	193	194	194	194	194	194	194
IE	2	2	2	2	2	2	2	2	192	192	192	192	192	1	1	1	1	1	1
GB	102	102	102	102	21	18	19	17	19	19	21	26	28	62	67	67	72	68	21
GR	35	n/a	n/a	n/a	n/a	n/a	n/a	7	7	7	7	7	7	7	n/a	n/a	n/a	n/a	n/a
PT	16	16	16	23	23	23	24	24	24	24	127	28	28	28	28	28	28	28	28
ES	193	193	193	193	193	193	193	193	193	193	194	194	194	194	194	194	194	192	193
FI	193	193	193	194	194	194	194	194	194	194	194	194	194	194	194	194	194	194	194
AT	190	190	189	190	188	188	189	189	189	194	194	192	192	194	194	191	194	194	194
SE	190	190	193	193	194	194	194	194	194	194	194	194	194	194	194	194	194	194	194
EE							192	192	192	192	193	193	193	194	194	194	194	194	194
LV							n/a	42	52	48	50	50	53	n/a	n/a	7	192	193	n/a
LT							188	188	190	190	191	191	191	192	192	192	192	192	192
MT							n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
PL							60	87	101	192	88	193	193	193	194	194	194	194	194
SK							122	151	189	191	193	193	193	194	194	194	194	194	194
SI							188	188	190	192	193	193	192	194	194	194	194	194	194
CZ							190	190	192	192	193	193	143	142	194	194	194	194	194
HU							194	194	194	194	194	194	194	194	194	194	194	194	194
CY							n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BG										190	n/a	n/a	n/a	n/a	192	192	192	192	192
RO										n/a	192	192	192	192	192	192	192	192	192
HR																192	192	192	192

Indicators (WGI) of Worldbank (2019), the *Political Terror Scale (PTS)* based on human rights reports of the US Department of State (Gibney et al. 2017), and the mean of the civil liberties and political rights indicators of Freedom House (2017).[14] The Worldbank indicator is a measure of the probability of a country becoming a failed or fragile state and the probability that violence is used politically to persecute (parts of) the population. The other measure, the PTS, basically measures the extent of human rights violations by the state. In this sense, terror is defined as politically and officially organized, not as a criminal act, as terrorism is commonly considered. Finally, Freedom House (FH) indicators measure both civil liberties and political rights. It appears to be plausible that these indicators are good measures of political persecution and are decisive motives for individuals to escape their home country.[15]

Additionally, I include demographic variables from Worldbank (2017c). They consist of information on population size, the population share of children aged 14 or below, urban population, and the share of males. All variables are surveyed for both origin and destination countries.

Finally, gravity data provided by CEPII (2017) are added to the dataset. It includes the population-weighted distance between the origin and the destination country, an index for religious similarity (with 0 = no similarity and 1 = complete similarity), dummy variables for contiguity, a common currency, a (past) colonial relationship, a common language, EU membership, and if there is a PTA on imports from the origin country. The latter variable is included, as the openness towards migrants and the attractiveness of a (potential) destination are assumed to be correlated with the openness to bilateral international trade. In addition, binary variables for the EU accession year of origin and destination countries are included.

Table 4 provides summary statistics broken down by the origin of migration flows (migration from outside EU and intra-EU migration). It includes the mean, the standard deviation, and the minimum and maximum values of each variable. As the mean is only the mean of all country pairs in the dataset, I provide a mean weighted by the respective bilateral migration flow in order to calculate the mean values for a representative migrant.

The number of immigrants moving from any country in the world to an EU member country ranges widely between 0 and over 300,000 (Syria → Germany 2015). On the one hand, most migration flows happen on a small scale: nearly two-thirds

[15] Note that the political indicators have different scales: whereas the Worldbank indicator takes values between − 3.31 and 1.76, the PTS lies between 1 and 5 and the FH indicator is between 1 and 7. Whereas higher values of the first indicator denote higher political stability, the latter indicators take higher values once circumstances are given which are commonly referred to as being root causes of flight migration.

[14] There are plenty of other indicators, but they are not suitable for my purposes for different reasons. Firstly, some only cover a short period (the Global Peace Index (GPI), 2007–2017). Secondly, some indicators are only calculated for up to 170 countries (the Polity score of the Polity IV project and the GPI). Thirdly, the indicators rarely measure the actual impact of political factors on people's living conditions but rather, e. g., the degree of autocracy and democracy (Polity IV) on an institutional level. However, a violation of the rule of law or autocratic government need not lead to a positive migration decision. Violence and wars, political persecution, and discrimination seem much more decisive and can be measured better by the indicators mentioned above.

Table 4 Summary statistics

Variable	Migration from outside EU						Intra-EU migration					
	Obs	Mean	Wtd. mean[a]	SD	Min	Max	Obs	Mean	Wtd. mean[a]	SD	Min	Max
Immigration data												
Immigration	54,010	591.48	22,269.30	3,580.82	0.00	309,699.00	7983	2263.07	51,787.84	10,587.35	0.00	271,443.00
Log migrant stock in previous period	25,080	4.71	10.34	2.84	0.00	14.56	4139	7.08	11.19	2.52	0.00	13.94
Economic variables												
Log GDP per capita (2010 US$) of origin country	51,609	8.22	8.37	1.41	5.23	12.16	7983	10.25	9.85	0.62	8.78	11.63
Log GDP per capita (2010 US$) of destination country	54,010	10.35	10.50	0.63	8.78	11.63	7983	10.30	10.60	0.64	8.78	11.63
Differential in log GDP per capita (2010 US$)	51,609	2.13	2.12	1.55	− 3.25	6.22	7983	0.06	0.75	0.89	− 2.85	2.85
Unemployment (%; ILO estimate) in origin country	49,192	8.18	8.92	6.36	0.14	44.16	7983	8.73	9.27	4.27	1.80	27.47
Unemployment (%; ILO estimate) in destination country	54,010	8.28	8.53	3.85	1.80	26.09	7983	8.44	7.74	3.92	1.80	26.09
Differential in unemployment (%; ILO estimate)	49,192	0.10	− 0.39	7.46	− 41.40	25.82	7983	− 0.29	− 1.54	5.56	− 22.24	20.86
Political variables												
Political stability/no violence in origin country	53,542	− 0.20	− 0.64	0.99	− 3.31	1.62	7983	0.81	0.59	0.42	− 0.47	1.76
Political stability/no violence in destination country	54,009	0.89	0.64	0.43	− 0.47	1.76	7983	0.85	0.73	0.41	− 0.47	1.76
Difference in political stability/absence of violence	53,542	1.08	1.28	1.08	− 2.03	4.80	7983	0.04	0.14	0.57	− 1.93	1.93
Political terror scale in origin country	50,103	2.68	3.17	1.12	1.00	5.00	7983	1.39	1.68	0.53	1.00	3.00

Table 4 (continued)

Variable	Migration from outside EU						Intra-EU migration					
	Obs	Mean	Wtd. mean[a]	SD	Min	Max	Obs	Mean	Wtd. mean[a]	SD	Min	Max
Political terror scale in destination country	54,010	1.33	1.45	0.50	1.00	3.00	7983	1.33	1.27	0.49	1.00	3.00
Difference in political terror scale	50,103	− 1.35	− 1.72	1.21	− 4.00	2.00	7983	− 0.06	− 0.41	0.71	− 2.00	2.00
Freedom House indicator in origin country	53,563	3.65	3.80	1.91	1.00	7.00	7983	1.15	1.34	0.32	1.00	2.50
Freedom House indicator in destination country	54,010	1.11	1.11	0.28	1.00	2.50	7983	1.11	1.05	0.28	1.00	2.50
Difference in Freedom House indicator	53,563	− 2.53	− 2.69	1.93	− 6.00	1.50	7983	− 0.04	− 0.29	0.43	− 1.50	1.50
Demographic variables												
Log population of origin country	53,610	15.49	17.50	2.29	9.14	21.04	7983	15.98	16.93	1.42	12.90	18.23
Log population of destination country	54,010	16.13	17.50	1.37	12.96	18.23	7983	16.12	17.48	1.35	12.96	18.23
Population ages 0–14 in origin country (%)	50,591	32.09	27.46	9.95	12.94	50.39	7983	16.13	15.63	1.88	13.09	22.33
Population ages 0–14 in destination country (%)	54,010	16.14	15.56	1.72	13.09	22.33	7983	16.02	15.18	1.68	13.09	22.33
Urban population share in origin country (%)	53,610	53.47	57.99	23.32	7.83	100.00	7983	73.19	67.21	12.10	51.31	97.92
Urban population share in destination country (%)	54,010	73.54	75.96	11.78	51.31	97.92	7983	73.34	77.04	12.21	51.31	97.92
Male population share in origin country (%)	50,591	50.21	49.67	3.08	45.89	76.07	7983	48.79	48.60	1.05	45.79	50.67
Male population share in destination country (%)	54,010	48.77	49.00	0.94	45.79	50.23	7983	48.71	49.08	1.01	45.79	50.23
Dyadic variables												

Table 4 (continued)

Variable	Migration from outside EU						Intra-EU migration					
	Obs	Mean	Wtd. mean[a]	SD	Min	Max	Obs	Mean	Wtd. mean[a]	SD	Min	Max
Distance (population weighted, log km)	52,112	8.64	8.21	0.70	5.19	9.88	7983	7.01	6.90	0.59	5.08	8.22
Common border	52,112	0.01	0.05	0.09	0.00	1.00	7983	0.13	0.29	0.33	0.00	1.00
Colonial relationship	52,112	0.04	0.27	0.19	0.00	1.00	7983	0.03	0.13	0.17	0.00	1.00
Common language	52,112	0.04	0.24	0.19	0.00	1.00	7983	0.04	0.07	0.19	0.00	1.00
Religious similarity	51,816	0.18	0.17	0.24	0.00	0.97	7983	0.31	0.26	0.29	0.00	0.94
Common currency	52,112	0.01	0.00	0.08	0.00	1.00	7983	0.33	0.29	0.47	0.00	1.00
Preferential trade agreement on imports from origin country	52,112	0.43	0.11	0.50	0.00	1.00	–	–	–	–	–	–

[a]Mean of variable weighted by the size of the respective bilateral migration flows

(61.6%) of observations involve fewer than 50 people, and nearly a quarter of observations does not exhibit any migration (24.1%).[16] On the other hand, there are considerable outliers, leading the distribution to be heavily skewed to the right: 10.6% of observations are defined by migration flows of more than 1000 persons, and still 1.7% are characterized by more than 10,000 immigrants. The most considerable migration flows (more than 100,000 migrants annually) can be mostly observed within Europe, including migration from Poland (2004–2016) and Romania (2012–2016) to Germany as well as from Romania to Italy (2007–2009) and Spain (2004–2007). The only exception is immigration from Syria to Germany, which amounted to 309,699 in 2015 and 179,503 in 2016. However, the weighted mean distance of these very large migration flows amounted only to 1326 km which is approximately the linear distance between Hamburg and Rome.[17]

Concerning the economic variables, data availability is high for origin countries and perfect for destination countries. GDP per capita is substantially larger for destination countries compared to origin countries—even in the context of intra-EU migration. Also unemployment appears to be much lower when weighting by the number of immigrants. Whereas the GDP differential is larger for immigrants from outside the EU, the unemployment differential is larger for migrants within the EU. This may be a hint for a large-scale reallocation of labor within the European Single Market via migration.

Furthermore, when it comes to political variables, destination countries are clearly above average regarding political stability, the absence of violence, as well as political rights and civil liberties—and this result also holds true for intra-EU migration. Even so, the political difference is particularly larger for immigrants from outside the EU. Thus, people from the rest of the world appear to have not only economic but also political incentives to immigrate into the EU.[18]

However, these incentives may not necessarily cause a positive migration decision for reasons of cost. Relevant costs consist of, on the one hand, *migration costs*, which depend on the distance as well as a common border between origin and destination country, and, on the other hand, on *integration costs*, which crucially depend on a common language, cultural proximity (measured by a common colonial relationship and religious similarity), and a common currency. As can be seen in Table 4, proximity and cultural similarity usually increase once data are weighted by the number of immigrants. While comparing these values to the unweighted means, (cultural) proximity appears to play a major role in migration both from outside and within the EU. Finally, PTAs are only relevant for migration from outside the EU. Apparently, when analyzing the summary statistics, migration seems to act as

[16] The latter portion should be expected to be underestimated, as data gaps should appear disproportionately, often for pairs of countries with no bilateral migration.

[17] The weighted mean distance of less frequented migration routes was 3566 km (between 10,000 and 100,000 immigrants per year) and 4228 km (less than 10,000 immigrants). This coincides with the old and intuitive finding that "the bulk of migrants had journeyed but a very little distance" (Ravenstein 1885, p. 182).

[18] Note that politically more liberal and peaceful countries exhibit larger values in the PTS indicator, but smaller values in the other two measures.

a substitute rather than a complement to international trade, as a PTA exists for 43% of country pairs, but only for 11% of international migrants.[19]

Methodology and Specification

In order to yield valid empirical results, one has to consider different econometric approaches. In the following, I discuss four related questions: firstly, whether the sample should be split up into a dataset for migration within the EU and one for migration from outside the EU; secondly, whether a loglog or a generalized linear model approach should be used; thirdly, as it is panel data to be analyzed, which FE should be used; and fourthly, whether these FE should be used or whether random effects (RE) should be used (or none).

The first question depends on the goal of the analysis; as immigration from outside the EU has received increasing attention in the media as well as in science (see e. g. Apostolova 2016; Hatton 2016; Tétényi et al. 2018; European Commission 2018), it appears to be promising to disentangle migration motives of immigrants from inside and outside the EU. In addition, motives might be different for non-EU immigrants. Therefore, in the following, each estimation is performed twice—once for each sample.[20]

Concerning the second question, a loglog estimation approach appears to be suitable to estimate so-called *migration impact elasticities* in the context of a gravity model of migration (Anderson 2011) and usually yields a large fit. There is only one obstacle: the high number of zeros in the dependent variable (M_{ijt}). These values disappear while taking logs, thereby diminishing the sample size. Thus, the sample shrinks, reducing the significance and external validity of the results. Occasionally, in order to overcome this problem, it is common to take the log of the variable plus one unit, i.e., $\log(M_{ijt} + 1)$. However, this remedy only yields acceptable results if the share of zero values is negligible or at least sufficiently small (Wooldridge 2006, p. 199). Actually, this is not the case in the present dataset, in which nearly every fourth observation contains no immigrants. As a consequence, logs have to be taken of the original values—but then losing the zero observations for further analysis. As an alternative, a generalized linear model can overcome this problem of estimating elasticities: the Poisson regression model. As migration data are usually overdispersed, a PPML approach estimating also the dispersion parameter is applied to the data. In the literature, there is a debate on the usage of PPML estimation, as it allows all non-negative values for the dependent variable (Beine et al. 2016a) and is generally used for count data and especially gravity models of trade (Santos Silva and Tenreyro 2006). This approach has also been applied to international migration

[19] Note that these so-called *dyadic* variables—as they hardly change in time—disappear once country-pair FE are taken into account in the empirical analysis in "Regression Results" section and thus are not explicitly included in some of the following regression models.

[20] In the following, sub-sample I refers to bilateral migration flows from outside the EU and sub-sample II refers to intra-EU migration.

(Beine et al. 2011; Belot and Ederveen 2012; Bertoli and Fernández-Huertas Moraga 2012; Derin-Güre 2014; Beine and Parsons 2015; Poprawe 2015). The present paper compares the results of loglog ordinary least squares (OLS) estimation in a first step to PPML estimation results in a second step.

Now, the third question is which FE should be used. There have been different proposals concerning this issue in the literature. The first one is to use time FE in combination with country-pair FE, as it captures the time-invariant relationship between origin and destination country as well as time-specific characteristics such as time trends (e.g., Artal-Tur et al. 2015). The second is to use origin-year FE and destination FE (e.g., in Ortega and Peri 2013). The third is to use destination-year FE and origin FE (e.g., in Beine and Parsons 2015). In order to decide which to use, the concept of *multilateral resistance to migration* should be considered: as migrants not only weigh the conditions in their origin and eventual destination countries against one another but they also include alternative (but not actually chosen) destinations into their rationale, the size of bilateral migration flows does not only depend on the characteristics of the origin and the destination country but rather on the features of *all* countries. Including only the former therefore suffers from an omitted variable bias (OVB) causing an endogeneity problem, since the regressors are correlated with the error term (Bertoli and Fernández-Huertas Moraga 2013).[21] A Polish migrant immigrating to Germany does not only decide *in favor* of Germany as the destination country but also *against*, e.g., the UK. This multilateral resistance can best be taken into account by including destination-year FE, as they catch the relative attractiveness of a specific destination country in a specific year.[22] However, in this approach, some coefficients (i.e., those of the differentials) cannot be estimated due to overidentification. An overidentification problem also arises in the second approach, as the impact of the economic and political characteristics in the origin country cannot be estimated properly with origin-year FE. Therefore, for sub-sample I, I rely on the first approach leading to the following baseline estimation equation for OLS regression:

$$\begin{aligned} m_{ijt} = {} & \beta_1 econ_{it} + \gamma_1 \Delta econ_{ijt} + \beta_2 pol_{it} + \gamma_2 \Delta pol_{ijt} \\ & + \beta_3 Pop_i + \gamma_3 Pop_j + \zeta_1 d_{ij} + \zeta_2 d_t + \epsilon \end{aligned} \tag{4}$$

including the variables of interest (*econ* for economic characteristics, here either GDP per capita or unemployment, and *pol* for political characteristics, here WGI, PTS or Freedom House; Δ is the difference operator), gravity variables (*Pop*, the distance is not included as it is caught by the country-pair dummies), and sets of dummies for the FE (d). For PPML regression, the model is

$$M_{ijt} = \exp(\beta_1 econ_{it} + \gamma_1 \Delta econ_{ijt} + \beta_2 pol_{it} + \gamma_2 \Delta pol_{ijt} + \beta_3 Pop_i + \gamma_3 Pop_j + \zeta_1 d_{ij} + \zeta_2 d_t + \epsilon). \tag{5}$$

[21] This is also a common problem in trade literature (Anderson and van Wincoop 2004).

[22] Alternative approaches use time-dependent mean income (Mayda 2010) or the common correlated effects estimator of Pesaran (2006) (Bertoli and Fernández-Huertas Moraga 2013).

Table 5 Breusch/Pagan test statistics (null hypothesis: no significant FE)

Effects	Sub-sample I	Sub-sample II
Individual FE	189,462.6	25,757.8
Time FE	115.4	146.8
Individual and time FE	189,578.0	25,904.5

However, for sub-sample II, the number of observations is much smaller and by including country-pair FE, a considerable loss of degrees of freedom arises. Therefore, I only use origin and destination FE (d_i and d_j, respectively) for sub-sample II.

The fourth question is whether to use an FE or an RE model or neither one. At first, a Breusch–Pagan test is performed testing the null hypothesis that all FE together do not have a significant impact on the endogenous variable (here: migration). Independent of the chosen set of FE and the sub-sample, the test statistic takes very high values (Table 5). Accordingly, the null hypothesis can be dropped, suggesting that both time *and* entity FE should be included in the regression model. By contrast, pooling the data would yield biased estimates.

In addition, a Hausman test is performed in order to test whether an RE model is consistent. The corresponding χ^2 statistic amounts to 56.2 for sub-sample I and 56.6 for sub-sample II. The null hypothesis, which states that the exogenous variables and the error term are uncorrelated, can consequently be dropped. An RE model would be inconsistent, since it would suffer from an endogeneity problem.

As this study assesses the relative impact of different determinants on migration and the exogenous variables have different variances, the corresponding coefficients cannot be compared offhand in order to determine which regressor is the most influential. In order to calculate the relative importance of a variable x_p (and its differential) in OLS regression models, the corresponding estimators $\hat{\beta}_p$ and $\hat{\gamma}_p$ have to be standardized:

$$b_p = \frac{s(x_p)}{s(m_{ijt})}\beta_p \;\wedge\; g_p = \frac{s(\Delta x_p)}{s(m_{ijt})}\gamma_p, \tag{6}$$

where $s(\cdot)$ is a variable's standard deviation (Bring 1994; Wooldridge 2006, p. 195 et seqq.). The relative importance is therefore an increasing function in the standard deviation of the exogenous variable because it is able to explain larger parts of the endogenous variable's variance if it varies more widely itself. Furthermore, the standardized impact of an exogenous variable decreases with the standard deviation of the endogenous variable. The standardized coefficient b_p (or g_p, respectively) can then be interpreted as the change in the endogenous variable, measured in standard deviations, when the exogenous variable increases by one standard deviation.[23]

[23] Standardized coefficients have already been used in the analysis of drivers of migration (see e.g. Karemera et al. 2000; Migali 2018).

For PPML regression, coefficients can be standardized analogously:

$$b_p = s(x_p)\beta_p \wedge g_p = s(\Delta x_p)\gamma_p. \tag{7}$$

However, these coefficients cannot be interpreted equivalently. They rather define the approximate percentage change of the endogenous variable, when an exogenous variable increases by one standard deviation (Long 1997, p. 225).

Regression Results

Migration from Outside the EU

Following the empirical strategy of the previous section gives the results in Table 6 concerning migration from outside the EU. The models are able to explain a large part of the variance in bilateral migration flows. As discussed in the previous section, the pooled baseline model in the first column is only shown for the sake of completeness, as it lacks highly significant FE. In addition, the FE models also include the first lag of migrant stock, as migrants often follow the paths of previous migrants.[24] Thus, the second column only adds FE and lagged migrant stock to the loglog OLS model. Finally, the other columns show PPML regression results and vary the measures of the variables of interest—namely, unemployment as a substitute for GDP as well as the PTS and the FH indicator as substitutes for the Worldbank indicator on political stability and absence of violence. All models but the baseline model further include demographic data of both the origin and destination countries.

Independent of the chosen model, the economic circumstances in the origin country appear to be positively related to international migration: Whereas unemployment does not have a robust impact, the coefficient of GDP per capita is estimated to be significantly above zero. As data in the PPML estimation also include zero migration and thus are the most complete, the corresponding coefficients are the most reliable: GDP elasticity of migration (i.e., the coefficient of log GDP per capita in the origin country) is about 4.94–7.26. A 1% growth in real GDP per capita *ceteris paribus* leads to an increase in migration of about 5–7%, consequently. However, this effect is compensated by the effect of the international income differential: once GDP increases in the origin country, the differential of GDP in the destination and in the origin country decreases, thereby leading to lower migration as suggested by the results in columns (3)–(5) in Table 6. Thus, the overall impact of GDP growth in the origin country is ambiguous, as there are contrary effects: consistent

[24] Diasporas are very important in the economics of international migration as they decrease integration costs (Carrington et al. 1996; Beine et al. 2011). They also provide valuable information on administrative and strategic issues as well as on the actual perspectives of potential migrants in the destination country.

However, the inclusion of lagged bilateral migration flows would suffer from Nickell's bias (Nickell 1981). This bias leads to a systematic downward bias in the estimator of the lagged dependent variable. For this reason, lagged migrant stock is used in order to capture the network effect.

Table 6 Results from regression (sub-sample I)

	OLS		PPML					
	log(immi)		immi					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log migrant stock in previous period		0.2690***	0.2999***	0.3352***	0.3090***	0.4073***	0.4468***	0.4169***
		(0.0259)	(0.0119)	(0.0118)	(0.0119)	(0.0119)	(0.0121)	(0.0120)
Log GDP per capita (2010 US$) of origin country	1.4728***	0.6864	7.2603***	4.9415***	4.9885***			
	(0.0634)	(0.4603)	(0.1643)	(0.1711)	(0.1859)			
Differential in log GDP per capita (2010 US$)	1.1159***	0.8571*	7.3459***	4.9922***	5.1448***			
	(0.0548)	(0.4458)	(0.1600)	(0.1671)	(0.1822)			
Unemployment (%; ILO estimate) in origin country						− 0.0405***	0.0099**	0.0015
						(0.0035)	(0.0040)	(0.0035)
Differential in unemployment (%; ILO estimate)						− 0.0908***	− 0.0599***	− 0.0752***
						(0.0022)	(0.0029)	(0.0023)
Political stability/no violence in origin country	− 0.1959**	− 0.1611**	− 0.6525***			− 0.3808***		
	(0.0935)	(0.0672)	(0.0334)			(0.0352)		
Difference in political stability/no violence	0.0015	− 0.0049	− 0.5675***			− 0.0342		
	(0.0887)	(0.0602)	(0.0319)			(0.0334)		
Political terror scale in origin country				0.3795***			0.4849***	
				(0.0149)			(0.0189)	
Difference in political terror scale				0.3434***			0.3407***	
				(0.0125)			(0.0167)	
Freedom House indicator in origin country					0.5079***			0.9689***
					(0.0311)			(0.0298)
Difference in Freedom House indicator					0.4541***			0.8498***
					(0.0300)			(0.0286)

Table 6 (continued)

	OLS		PPML					
	log(immi)		immi					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log population of origin country	0.6649***	0.7605***	2.6336***	2.8223***	2.6282***	1.9386***	1.6583***	1.5274***
	(0.0173)	(0.2088)	(0.0902)	(0.0898)	(0.0901)	(0.0904)	(0.0912)	(0.0906)
Male population in origin country (%)		− 0.1054***	− 0.1784***	− 0.2186***	− 0.1684***	− 0.2624***	− 0.2542***	− 0.2587***
		(0.0319)	(0.0279)	(0.0277)	(0.0279)	(0.0311)	(0.0319)	(0.0314)
Urban population in origin country (%)		0.0008	− 0.0010	0.0033	0.0006	− 0.0516***	− 0.0574***	− 0.0585***
		(0.0063)	(0.0028)	(0.0027)	(0.0028)	(0.0029)	(0.0029)	(0.0028)
Population ages 0–14 in origin country (%)		− 0.0441***	− 0.0407***	− 0.0422***	− 0.0305***	− 0.0355***	− 0.0115**	− 0.0049
		(0.0093)	(0.0043)	(0.0043)	(0.0043)	(0.0047)	(0.0046)	(0.0046)
Log population of destination country	0.9486***	− 2.6509**	0.5721	1.4977***	3.9353***	6.7761***	4.3728***	9.5876***
	(0.0257)	(1.0404)	(0.4163)	(0.3978)	(0.3992)	(0.4681)	(0.4765)	(0.4533)
Male population in destination country (%)		0.3607***	− 0.7325***	0.0903*	0.0732	− 0.6745***	− 0.1985***	− 0.4145***
		(0.1275)	(0.0606)	(0.0483)	(0.0497)	(0.0664)	(0.0619)	(0.0580)
Urban population in destination country (%)		0.0331***	0.0420***	0.0422***	0.0580***	0.0646***	0.0505***	0.0542***
		(0.0073)	(0.0039)	(0.0038)	(0.0037)	(0.0044)	(0.0044)	(0.0041)
Population ages 0–14 in destination country (%)		− 0.2440***	− 0.4297***	− 0.3959***	− 0.4643***	− 0.3161***	− 0.3305***	− 0.4033***
		(0.0213)	(0.0140)	(0.0142)	(0.0142)	(0.0151)	(0.0155)	(0.0154)
EU accession of destination (dummy)		− 0.0853	0.0532	0.0025	− 0.0469	− 0.4270***	− 0.3048***	− 0.4237***
		(0.0634)	(0.0511)	(0.0508)	(0.0515)	(0.0577)	(0.0590)	(0.0579)
Constant	− 37.1080***							
	(0.8332)							
Country-pair FE	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Origin country FE	No	No	No	No	No	No	No	No

Table 6 (continued)

	OLS		PPML					
	log(immi)		immi					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Destination country FE	No	No	No	No	No	No	No	No
Time FE	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	37,990	20,292	23,490	23,076	23,424	23,748	23,453	23,671
R^2	0.4783	0.9346						
McFadden's pseudo-R^2			0.9887	0.9639	0.9886	0.9859	0.9855	0.9860

White–Huber robust standard errors for OLS models, *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$

with Hypothesis 1a, it relaxes individuals' budget constraints opening up new possibilities to migrate, but it simultaneously decreases the economic incentive to migrate (Hypothesis 2). For this purpose, an F test is employed testing the null hypothesis that the coefficients equal each other. This hypothesis cannot be rejected for any model, which means that the positive (*direct*) impact of GDP growth on migration appears to be compensated by the negative (*indirect*) impact via the decreasing income differential.

For unemployment, we cannot find corresponding evidence: The effect of unemployment in the origin country is not unambiguous. Even so, the impact of the unemployment differential is negative. This implies that migration shrinks as unemployment in (potential) destination countries increases (and the differential increases). At least this finding supports the results with regard to GDP data.

Regarding the political determinants, migration appears to be negatively related to political conditions: the better political conditions are in the origin country (i.e., the higher the Worldbank indicator and the lower the PTS and FH values), the lower is the respective emigration flow. For political determinants, Hypothesis 1b (need) appears to outweigh Hypothesis 1a (feasibility). In addition, at least as far as the political terror scale and the Freedom House indicator are concerned, Hypothesis 2 (incentive) also holds true. Increasing international political differences are associated with higher bilateral migration. These findings suggest a significant share of flight migration from outside the EU.

Standardized coefficients are shown in Table 7. In the FE models, political factors largely lack major importance: the standardized coefficients of political determinants are below 1.90 (and even considerably lower once GDP is taken into account), whereas GDP data have higher coefficients of 7.33 to 11.80. Even compared to the standard control variables of gravity models of migration such as population size, GDP appears to be the major determinant of migration. Furthermore, relevant economic conditions do not appear to be captured by the unemployment rate, as the corresponding standardized coefficients are relatively low (below 0.65 in absolute values).

Migration Within the EU

In Table 8, the very same regression models are employed for intra-EU migration (sub-sample II) as in Table 6 (sub-sample I). At first glance, the models have a good fit, and GDP per capita in the origin country has a significant and positive effect on intra-European migration (at least in the preferred PPML models), which is in line with Hypothesis 1a. The GDP elasticity is estimated to 3.20–4.11. In addition, the impact of the international income differential is positively related to migration: an increase in the income differential by one percentage point increases migration by 6.00–6.94%. This supports Hypothesis 2. However, the estimate for the income differential is significantly higher than that of GDP per capita in the origin country. Thus, the *overall* effect of GDP growth in the origin country on migration is

Table 7 Standardized coefficients (sub-sample I)

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log migrant stock in previous period		0.2971	0.8652	0.9621	0.8923	1.1703	1.2795	1.1989
Economic variables								
Log GDP per capita (2010 US$) of origin country	0.8803	0.4263	10.8034	7.3386	7.4299			
Differential in log GDP per capita (2010 US$)	0.7343	0.5781	11.8030	8.0084	8.2755			
Unemployment (%; ILO estimate) in origin country						− 0.2377	0.0581	0.0089
Differential in unemployment (%; ILO estimate)						− 0.6114	− 0.4045	− 0.5030
Political variables								
Political stability/no violence in origin country	− 0.0761	− 0.0655	− 0.6315			− 0.3771		
Difference in political stability/no violence	0.0007	− 0.0021	− 0.5931			− 0.0364		
Political terror scale in origin country				0.4217			0.5477	
Difference in political terror scale				0.4110			0.4133	
Freedom House indicator in origin country					0.9758			1.9041
Difference in Freedom House indicator					0.8816			1.6866
Control variables								
Log population of origin country	0.4826	0.5323	4.7347	4.9164	4.7423	3.3208	2.7808	2.6233
Male population in origin country (%)		− 0.1107	− 0.4868	− 0.6006	− 0.4600	− 0.7135	− 0.6946	− 0.7041
Urban population in origin country (%)		0.0071	− 0.0218	0.0734	0.0132	− 1.1509	− 1.2765	− 1.3059
Population ages 0–14 in origin country (%)		− 0.1973	− 0.4366	− 0.4537	− 0.3269	− 0.3833	− 0.1242	− 0.0530
Log population of destination country	0.4989	− 1.0395	0.5378	1.4044	3.6998	6.3586	4.1012	8.9977
Male population in destination country (%)		0.1060	− 0.5360	0.0662	0.0535	− 0.4943	− 0.1454	− 0.3033
Urban population in destination country (%)		0.1655	0.5129	0.5164	0.7076	0.7902	0.6185	0.6622
Population ages 0–14 in destination country (%)		− 0.1679	− 0.7099	− 0.6537	− 0.7674	− 0.5219	− 0.5455	− 0.6660
EU accession of destination (dummy)		− 0.0037	0.0063	0.0003	− 0.0055	− 0.0504	− 0.0359	− 0.0500

Table 8 Results from regression (sub-sample II)

	OLS		PPML					
	log(immi)		immi					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log migrant stock in previous period		0.7328***	0.7294***	0.7260***	0.7268***	0.7182***	0.7134***	0.7151***
		(0.0147)	(0.0090)	(0.0090)	(0.0090)	(0.0091)	(0.0091)	(0.0090)
Log GDP per capita (2010 US$) of origin country	1.1002***	− 4.5654***	4.1080***	3.5930***	3.1995***			
	(0.0408)	(0.4907)	(0.4390)	(0.4488)	(0.4758)			
Differential in log GDP per capita (2010 US$)	1.8268***	− 2.5930***	6.9424***	6.4440***	6.0037***			
	(0.0245)	(0.4466)	(0.3940)	(0.4071)	(0.4386)			
Unemployment (%; ILO estimate) in origin country						− 0.0354***	− 0.0335***	− 0.0235***
						(0.0065)	(0.0073)	(0.0065)
Differential in unemployment (%; ILO estimate)						− 0.0812***	− 0.0801***	− 0.0697***
						(0.0047)	(0.0059)	(0.0048)
Political stability/no violence in origin country	0.0818	0.4223***	0.1954**			0.4495***		
	(0.0600)	(0.1150)	(0.0882)			(0.0880)		
Difference in political stability/no violence	− 0.3526***	0.4038***	0.2337***			0.5144***		
	(0.0454)	(0.0867)	(0.0710)			(0.0702)		
Political terror scale in origin country				0.2039***			0.0567	
				(0.0361)			(0.0410)	
Difference in political terror scale				0.1670***			0.0108	
				(0.0285)			(0.0342)	
Freedom House indicator in origin country					0.3161***			0.6001***
					(0.0855)			(0.0814)
Difference in Freedom House indicator					0.4062***			0.6730***
					(0.0663)			(0.0605)

Table 8 (continued)

	OLS		PPML					
	log(immi)		immi					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log population of origin country	0.9363***	1.1621***	2.8204***	2.9119***	2.7185***	4.2014***	4.1770***	3.9684***
	(0.0122)	(0.3686)	(0.4670)	(0.4642)	(0.4668)	(0.4746)	(0.4763)	(0.4732)
Male population in origin country (%)		− 0.1684**	0.2439***	0.2161***	0.2421***	0.4703***	0.4692***	0.4426***
		(0.0678)	(0.0678)	(0.0667)	(0.0670)	(0.0746)	(0.0732)	(0.0725)
Urban population in origin country (%)		− 0.0033	0.0071	0.0071	0.0104	0.0374***	0.0379***	0.0376***
		(0.0094)	(0.0089)	(0.0087)	(0.0088)	(0.0090)	(0.0088)	(0.0088)
Population ages 0–14 in origin country (%)		− 0.0111	− 0.0162	− 0.0069	− 0.0063	0.0040	0.0108	0.0187
		(0.0197)	(0.0233)	(0.0229)	(0.0229)	(0.0237)	(0.0236)	(0.0233)
Log population of destination country	0.8777***	− 2.1449*	− 1.0442	− 2.5486***	− 1.5548*	3.1638***	0.6327	1.5549
	(0.0128)	(1.1022)	(0.9278)	(0.8904)	(0.8890)	(1.0150)	(1.0204)	(0.9632)
Male population in destination country (%)		1.0766***	0.1590	− 0.0406	− 0.0227	0.1058	− 0.4732***	− 0.3753***
		(0.1652)	(0.1456)	(0.1164)	(0.1174)	(0.1487)	(0.1365)	(0.1267)
Urban population in destination country (%)		0.0829***	0.0809***	0.0617***	0.0678***	0.0866***	0.0694***	0.0606***
		(0.0068)	(0.0075)	(0.0074)	(0.0072)	(0.0077)	(0.0078)	(0.0075)
Population ages 0–14 in destination country (%)		− 0.1775***	− 0.3460***	− 0.3431***	− 0.3775***	− 0.2251***	− 0.2405***	− 0.2931***
		(0.0263)	(0.0290)	(0.0291)	(0.0293)	(0.0307)	(0.0311)	(0.0310)
EU accession of origin (dummy)		− 0.0330	0.1018**	0.0519	0.1055***	0.1064***	0.0829**	0.1226***
		(0.0971)	(0.0407)	(0.0415)	(0.0409)	(0.0407)	(0.0414)	(0.0407)
EU accession of destination (dummy)		− 0.6554***	0.6256***	0.6054***	0.5257***	0.2305	0.1505	0.1555
		(0.1854)	(0.1405)	(0.1413)	(0.1423)	(0.1406)	(0.1431)	(0.1411)
Distance (population weighted, log km)		− 0.0577	− 0.2210***	− 0.2313***	− 0.2253***	− 0.2183***	− 0.2290***	− 0.2239***
		(0.0414)	(0.0322)	(0.0323)	(0.0323)	(0.0326)	(0.0330)	(0.0326)

Table 8 (continued)

	OLS		PPML					
	log(immi)		immi					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Common border		0.1068**	0.0385	0.0274	0.0376	0.0627*	0.0527	0.0591*
		(0.0495)	(0.0324)	(0.0326)	(0.0326)	(0.0330)	(0.0336)	(0.0331)
Colonial relationship		− 0.1363**	0.2831***	0.2941***	0.2885***	0.3304***	0.3376***	0.3400***
		(0.0600)	(0.0388)	(0.0389)	(0.0390)	(0.0394)	(0.0398)	(0.0394)
Common language		− 0.0908	− 0.0304	− 0.0245	− 0.0248	− 0.0293	− 0.0280	− 0.0164
		(0.0598)	(0.0421)	(0.0423)	(0.0423)	(0.0431)	(0.0436)	(0.0430)
Religious similarity		0.2014***	− 0.0636	− 0.0569	− 0.0536	− 0.0215	− 0.0192	− 0.0026
		(0.0440)	(0.0545)	(0.0546)	(0.0548)	(0.0555)	(0.0562)	(0.0557)
Common currency		− 0.1057**	− 0.0471	− 0.0659	− 0.0523	− 0.1207***	− 0.1255***	− 0.1287***
		(0.0412)	(0.0429)	(0.0430)	(0.0430)	(0.0436)	(0.0442)	(0.0435)
Country-pair FE	No	No	No	No	No	No	No	No
Origin country FE	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Destination country FE	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7492	4069	4139	4139	4139	4139	4139	4139
R^2	0.7077	0.9878						
McFadden's pseudo-R^2			0.9905	0.9905	0.9905	0.9902	0.9900	0.9903

White–Huber robust standard errors for OLS models, *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$

negative although the *direct* effect is positive. Unemployment data also appear to support Hypotheses 1a and 2.

The estimates for the political indicators do not always act in the same direction: whereas according to the PTS and the FH indicator, political conditions in the origin country are (not always significantly) positively related to migration, the coefficient of the Worldbank indicator is also positive—which is surprising as the variable is coded differently. Additionally, a higher differential between political conditions in the origin and destination country is associated with higher migration—at least according to PTS and Freedom House data—which corroborates the incentive hypothesis. This appears to support a flight motive within the EU. However, as this is not confirmed by Worldbank data, this finding should be interpreted with caution.

The minor role of political determinants is also stressed by their standardized coefficients, which amount to values not bigger than 0.79 (in absolute terms) (see Table 9). Unemployment appears to be also unimportant, but GDP per capita does not: whereas GDP per capita in the origin country usually exhibits standardized coefficients of about 4.76–6.10, the standardized impact of the income differential amounts to roughly 9.65–11.14. However, also for migration within the EU, path dependencies seem to play a major role, as the standardized coefficient of lagged migrant stock is estimated to lie around 2.

Discussion

The present analysis yields interesting findings on the dynamics of bilateral migration flows from outside and within the EU. However, some econometric issues as well as the interpretation of the results should be discussed carefully.

The first econometric issue is that the characteristics of *every* (potential) destination country might affect a bilateral migration flow between country *i* and country *j*. Thus, the attractiveness of a destination is always defined in relative terms. As already pointed out in "Methodology and Specification" section , this is referred to as "multilateral resistance to migration" in the literature and is a common problem (Anderson 2011).[25] As mentioned above, the usage of different FE (especially destination-year dummies) in order to account for this multilateral resistance causes further problems, namely that the effects of some variables of interest cannot be estimated. Thus, multilateral resistance is only controlled for by time FE, which may be enough for my purposes.

The second econometric issue consists of an omitted variable: immigration policy of the destination country, which might be of major importance for bilateral

[25] In addition, "multilateral resistance" is also exerted by the (expected) future attractiveness of alternative countries because migrants can not only decide *where* to go, but also *at which point in time* to migrate (Bertoli et al. 2016). In the end, this would mean having to include not only the characteristics of all countries at time *t* but also the expected development of all countries as regressors—which is infeasible.

Table 9 Standardized coefficients (sub-sample II)

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log migrant stock in previous period		0.8087	2.1046	2.0845	2.0996	2.0641	2.0435	2.0571
Economic variables								
Log GDP per capita (2010 US$) of origin country	0.6576	− 2.8271	6.1038	5.3283	4.7584			
Differential in log GDP per capita (2010 US$)	1.2021	− 1.7445	11.1407	10.3247	9.6451			
Unemployment (%; ILO estimate) in origin country						− 0.2060	− 0.1959	− 0.1350
Differential in unemployment (%; ILO estimate)						− 0.5444	− 0.5380	− 0.4633
Political variables								
Political stability/no violence in origin country	0.0318	0.1705	0.1880			0.4424		
Difference in political stability/no violence	− 0.1498	0.1761	0.2430			0.5445		
Political terror scale in origin country				0.2250			0.0636	
Difference in political terror scale				0.1987			0.0130	
Freedom House indicator in origin country					0.6079			1.1804
Difference in Freedom House indicator					0.7893			1.3366
Control variables								
Log population of origin country	0.6795	0.8108	5.0651	5.0641	4.9003	7.1852	6.9899	6.8047
Male population in origin country (%)		− 0.1780	0.6701	0.5975	0.6657	1.2873	1.2910	1.2132
Urban population in origin country (%)		− 0.0304	0.1606	0.1597	0.2330	0.8365	0.8463	0.8432
Population ages 0–14 in origin country (%)		− 0.0495	− 0.1728	− 0.0737	− 0.0676	0.0427	0.1160	0.2013
Log population of destination country	0.4616	− 0.8406	− 0.9821	− 2.3910	− 1.4625	2.9698	0.5936	1.4597
Male population in destination country (%)		0.3157	0.1162	− 0.0297	− 0.0166	0.0774	− 0.3463	− 0.2743
Urban population in destination country (%)		0.4134	0.9867	0.7535	0.8269	1.0583	0.8489	0.7398
Population ages 0–14 in destination country (%)		− 0.1221	− 0.5718	− 0.5666	− 0.6241	− 0.3717	− 0.3972	− 0.4843
EU accession of origin (dummy)		− 0.0009	0.0067	0.0035	0.0070	0.0070	0.0055	0.0081
EU accession of destination (dummy)		− 0.0283	0.0738	0.0715	0.0620	0.0273	0.0178	0.0184
Distance (population weighted, log km)		− 0.0220	− 0.1990	− 0.2082	− 0.2033	− 0.1954	− 0.2049	− 0.2007
Common border		0.0074	0.0061	0.0043	0.0059	0.0098	0.0083	0.0093

Table 9 (continued)

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Colonial relationship		− 0.0087	0.0412	0.0420	0.0421	0.0476	0.0483	0.0491
Common language		− 0.0063	− 0.0049	− 0.0039	− 0.0040	− 0.0047	− 0.0044	− 0.0026
Religious similarity		0.0197	− 0.0148	− 0.0133	− 0.0125	− 0.0050	− 0.0045	− 0.0006
Common currency		− 0.0103	− 0.0105	− 0.0148	− 0.0117	− 0.0268	− 0.0280	− 0.0286

migration flows. The present study does not include data on immigration policy for two reasons: 1. FE, and 2. data availability. Firstly, at least time-invariant immigration regulations are reflected by the entity FE, and that even holds for bilateral regulations (since entity FE are defined for a pair of countries). In addition, immigration policies which are in place for the whole EU are displayed in the time FE. Only those regulations and laws which vary across countries *and* time are not displayed in the present regressions.[26] Secondly, there is a lack of internationally comparable data on immigration policies. Currently, a database called International Migration Policy and Law Analysis (IMPALA) is being built up to fill this exact data gap concerning immigration policies and to conceptually solve the problem of international comparability of these policies. It inquires about different fields of immigration policy, such as family reunification, labor migration, and asylum migration, and tries to make them comparable (Beine et al. 2016b). However, this database is restricted to only 20 OECD member states and is still incomplete, thus not meeting the demands of the current study. Finally, for sub-sample II, this issue does not arise due to the European Single Market and the corresponding freedom of movement for EU foreigners.

Thirdly, PPML estimation is performed in "Regression Results" section in order to include observations with no bilateral migration at all. However, the problem of zero migration reappears once lagged migrant stock is zero—as it is also log transformed in the regression equation. As a consequence, sub-sample II (intra-EU migration) does not grow notably once the PPML regression is introduced to the analysis. This can be explained by the fact that there are only a few pairs of countries within the EU for which no corresponding migrant stock exists. However, subsample I increases considerably, receiving about 3200 additional observations and thus diminishing potentially biased results.

Fourthly, endogeneity has not been addressed in the present study: characteristics of the origin and destination countries—which are used as exogenous variables in this study—may be influenced by the endogenous variable, i.e., migration. Although the majority of migration flows is small and expected not to impact on macro-variables at a country level, the effects estimated above should not be interpreted causally, but as correlations.

Regarding the interpretation of the results, the effect of economic determinants is significant and unambiguous for both samples including migration within and from outside the EU. The *direct* effect of GDP per capita in the origin country is positive, as GDP growth supports the *feasibility* of migration. Especially

[26] Note that the problem of multilateral resistance also arises in the context of immigration policy since the immigration policy of one country causes externalities on the immigration to all other (alternative) destination countries (Bertoli and Fernández-Huertas Moraga 2012). As an example, immigration to countries in Northern Europe is substantially affected by the Dublin III regulation: asylum seekers have to make their application for asylum in the first destination country. African migrants in most cases arrive in Spain, Italy, Malta, and Greece thereby increasing immigration in the South and decreasing it in the North, which cannot be solely explained by geographic, economic, or political means—and, as far as the North is concerned, not solely by its *own* immigration policy.

when it comes to immigration from non-EU origin countries, immigrants have to travel longer distances (5122 km on average) making migration riskier and more expensive. Capital is needed upfront to finance international migration—especially because households' budget constraints are binding in the least developed countries (LDCs) due to incomplete capital markets (Clemens 2014, p. 59). As expected as migrants within the EU travel significantly shorter distances (about 1133 km) and face less migration costs (due to the European Single Market) and integration costs (due to cultural proximity), GDP growth in EU origin countries appears to have a smaller positive impact on migration. This finding may be explained by the fact that with smaller distances and an integrated common market, return and multiple migration are much easier to afford. Although unemployment is much less relevant as far as standardized regression coefficients are concerned, the results are qualitatively the same when replacing GDP by unemployment—at least regarding intra-EU migration. Therefore, Hypothesis 1a is supported for economic determinants.

For economic determinants, Hypothesis 2 also holds true for both sub-samples: the international income differential seems to be a decisive stimulating factor of international migration. The prospect of higher incomes in the destination country increases bilateral migration flows, especially within the EU, which supports anecdotal evidence on European East-West migration. Last but not least and as pointed out in "Data" section , the largest migration flows take place between Eastern and Western Europe—which is characterized by a short distance, a relatively high income differential and liberal political regulations. This finding is especially in line with the human capital model of migration founded by Sjaastad (1962). Although in political discourse right-wing and xenophobic parties often defame immigration from Eastern Europe as "immigration into social systems," these migration flows hold considerable potential for efficiency—which in fact is a *goal* (and not a side effect) of European integration.[27]

However, this finding contradicts the current focus of political discourse, which mainly concentrates on asylum, South–North migration (especially from Africa, Maghreb countries in particular) and immigration from the Middle East (especially Afghanistan, Iraq, and Syria). These migration flows are undoubtedly politically motivated and mainly consist of refugees. Their motives have been investigated in a number of empirical studies including the number of asylum seekers rather than the total number of immigrants as the endogenous variable (Neumayer 2005; Moore and Shellman 2007; Hatton 2016; Tétényi et al. 2018). But in the larger picture, these migratory flows are not representative of all migration and constitute only a small proportion of total migratory flows: even in 2015, which is referred to as the year of the "refugee crisis," Africans made up barely more than 10% of total immigrants in most EU countries (see Table 10) and people from the Middle East rarely

[27] Regarding the economic potential of migration for higher welfare, see e.g. Clemens (2011).

Table 10 Immigrants to EU member countries in 2015 broken down by continent of origin (percentages of total immigration); no data available for Cyprus, Greece, and Malta, little data available for Ireland (1 origin country), Portugal (28), and the UK (68)

Country	Europe	Asia	…thereof Middle East[a]	Africa	Americas
Austria	57.52	36.57	29.20	3.60	2.13
Belgium	41.47	40.49	34.12	14.64	3.30
Bulgaria	17.57	80.96	75.65	0.70	0.75
Croatia	83.37	10.25	3.76	2.17	3.74
Czech Republic	72.46	20.68	3.55	1.99	4.58
Denmark	39.62	46.81	33.25	9.96	3.05
Estonia	85.43	9.02	1.91	2.66	2.76
Germany	56.28	34.89	26.77	6.04	2.58
Finland	22.46	65.86	54.89	9.83	1.69
France	38.53	14.33	4.53	39.43	7.37
Hungary	8.16	86.04	69.75	4.50	1.26
Ireland	100.00	0.00	0.00	0.00	0.00
Italy	38.03	27.46	1.98	26.85	7.52
Latvia	85.18	12.75	1.06	0.60	1.38
Lithuania	79.85	17.39	3.54	1.57	1.16
Luxembourg	78.42	12.79	6.87	4.12	4.51
Netherlands	56.01	28.54	14.67	7.60	6.97
Poland	71.71	23.67	4.41	3.11	1.34
Portugal	43.88	20.22	0.00	16.69	19.20
Romania	57.49	27.06	17.00	8.95	6.25
Sweden	17.35	68.27	59.64	12.77	1.45
Slovakia	87.43	9.90	6.42	1.02	1.47
Slovenia	94.24	3.52	1.07	0.48	1.70
Spain	43.68	10.24	0.92	14.66	31.24
United Kingdom	53.32	30.19	3.43	4.71	7.07

Values do not always add up to 100, as Oceania is left out. Source: own calculation based on Eurostat (2019a, b, c) and OECD (2019)

[a] Deviating from its most common definition, the Middle East here includes Afghanistan, but not Egypt

made up more than a third—even when including Afghanistan, Iraq, and Syria, which are currently three of the largest sources of refugee flows.[28] The small (but not negligible) proportion of refugees in overall migration flows leads to the fact that Hypothesis 1b can be confirmed for sub-sample I indicating a significant share of

[28] Note that—besides political and economic factors—Table 10 also suggests that migrants choose destinations with a common history or culture: firstly, Europe is the main source for European destinations; and secondly, there are considerable immigration flows from former colonies, especially from the Americas to Portugal and Spain, from Africa to France and Italy and from Asia (excluding Middle East) to the UK. The latter is basically due to immigration from India and China. These figures indicate a finding that could also be confirmed in more elaborate empirical analyses: refugees often follow (former) colonial ties (Moore and Shellman 2007).

flight migration—however, these political determinants are much less important for explaining overall migration than economic determinants. Within the EU, the results regarding political factors are even not robust and support neither Hypothesis 1a nor Hypothesis 1b. Last but not least, the incentive hypothesis can only be supported robustly for political determinants regarding migration from outside the EU.

The most recent political debate has overshadowed the recognition that migration has been constant throughout human history[29] and that the main driving force is the economy. Finally, the high correlation between economic and political indicators suggests that subdividing migrants is analytic and hard to find in reality: "classifications of "economic migrants" and "political refugees" appeared to be oversimplifications, as political and economic causes frequently join forces in producing movement" (European Commission 2000, p. 4). The motives of migrants appear to be better described by a continuum in which both political *and* economic determinants play a role, but to a different extent. Of course, migrants, e. g., from Afghanistan and Syria escape from war and repression—but they do also escape from poverty and look for rich destination countries, as other migrants do. As a consequence, forced migrants should be seen as "people making choices under *highly constrained circumstances* [...], but nonetheless choosing where to flee" (Moore and Shellman 2007, p. 812). Similarly, so-called "economic migrants" try to reach better economic living conditions in the destination country, but they often also escape from discrimination and social deprivation. The point is not to lump all phenomena together but to emphasize that when it comes to motives for international migration, there are many shades of gray instead of just black or white.

Finally, one has to note that migration to the EU might suffer from a self-selection bias: on a global level, EU member countries are extraordinary wealthy and thus might be an attractive destination for especially economically motivated migrants, whereas refugees often migrate over shorter distances—particularly when they hope to return in the near future once a political conflict has been solved or repressive government has been replaced. As a consequence, in 2017, only 11% of all international refugees were hosted in the EU and this value further shrinks to 4 % when internally displaced persons are taken into account (UNHCR 2017). Therefore, the present results should not be extended to global migration as the determinants of migration within Africa or the Middle East might be different to the causes of migration within or into the EU.[30]

[29] The global migrant stock already amounted to about 2.4% of the global population in 1960 and increased to 3.4% in 2017 (UNPD 2017a; Worldbank 2017c). Although the rise in global migration is considerable and appears to be dramatic when measured in absolute numbers (from 71.9 to 257.7 million people), the rise in the percentage is much lower due to the extensive population growth within nearly six decades.

[30] In fact, empirical studies support the hypothesis that motives of cross-border refugees and those fleeing over larger distances may differ substantially (Moore and Shellman 2007).

Conclusion

The present study empirically investigates political and economic determinants of international migration within and from outside the EU within the period 1998–2016. Migration from outside the EU is found to be motivated both politically and economically. Evidence is found that better economic conditions in the origin country *increase* migration as they loosen budget constraints (and increase *feasibility*), and better political conditions *decrease* migration as flight motives (i.e., the *need* to migrate) shrink. Finally, the international income differential is positively related to migration flows because it induces a higher *incentive* to migrate. The incentive hypothesis can also be supported for political determinants. Eventually, due to the small share of refugees and potential self-selection, political determinants appear to be much less decisive for explaining immigration into the EU than the economy.

Regarding migration within the EU, no robust evidence can be found for the impact of political factors, whereas the impact of economic factors remains unchanged. Ambiguous results regarding the relevance of political determinants for migration within the EU may also be traced back to a low variance of political indicators within the EU (see Table 4).

Finally, dyadic variables seem to play a decisive role. Independent of economic and political determinants, large migratory flows can be found particularly between European countries and their former colonies. In accordance with the traditional literature on the economics of migration, most migration flows seem to occur over short distances—with a relevant share being only cross-border migration.

A more detailed analysis of migrant motives in certain sub-samples might be promising for further research. It is reasonable that political determinants are more important for short- to medium-distance migration especially from the Middle East and North Africa, whereas economic factors (potentially only on a micro-level) should be much more important for migration between (newly) industrialized countries. However, to the best of my knowledge, the present study provides uniquely robust empirical evidence regarding the dominance of economic determinants for overall immigration into EU member countries.

Two important limitations of the effects found in the present analysis remain: first, they are correlations rather than causal. It appears promising for future research to further address this issue and to discuss potential IV approaches. Second, they may suffer from an omitted variable bias as bilateral immigration policies could not be fully controlled for by the inclusion of FE. For immigration policy, data collection and methodological research on its measurement are desperately needed.

One important conclusion is that the economy matters even to refugees. Otherwise, they would have instead migrated to countries neighboring their origin country. For these migrants, political aspects might have caused their emigration from their origin country, but economic aspects defined their destination. It is important to stress that the present study only tries to deduce the relative importance of different motives; it does not discuss the legitimacy of these motives and whether certain groups of migrants should be let in or not. A more detailed normative analysis is needed which takes into account that the distinction between "economic migrants" and "genuine refugees" is archetypes but can hardly be observed in reality. Because some people stress that "economic migrants" should not be allowed to immigrate and because migrants' motives are often a mixture of political and economic determinants, there is still a normative need to define which threshold of relative importance of political determinants should define which people should be allowed to immigrate and which should not. This threshold has to be redefined, especially in the aftermath of the "refugee crisis" in 2015.

Appendix

See Table 11.

Table 11 Correlation matrix of economic and political variables. *Source:* Own calculation based on Eurostat (2019a, b, c) and OECD (2019)

Variable	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15
Log GDP per capita (2010 US$) of origin country (V1)	1.00	− 0.02	− 0.92	0.04	0.02	− 0.02	0.62	− 0.03	− 0.58	− 0.55	0.00	0.51	− 0.51	0.01	0.50
Log GDP per capita (2010 US$) of destination country (V2)	− 0.02	1.00	0.41	0.01	− 0.38	− 0.22	0.01	0.50	0.19	0.00	− 0.47	− 0.19	0.01	− 0.47	− 0.08
Differential in log GDP per capita (2010 US$) (V3)	− 0.92	0.41	1.00	− 0.03	− 0.16	− 0.06	− 0.56	0.22	0.61	0.51	− 0.18	− 0.54	0.47	− 0.19	− 0.49
Unemployment (%; ILO estimate) in origin country (V4)	0.04	0.01	− 0.03	1.00	0.00	− 0.85	− 0.02	0.02	0.03	− 0.03	− 0.01	0.03	− 0.12	− 0.00	0.12
Unemployment (%; ILO estimate) in destination country (V5)	0.02	− 0.38	− 0.16	0.00	1.00	0.53	− 0.00	− 0.48	− 0.19	− 0.01	0.17	0.08	− 0.00	0.11	0.02
Differential in unemployment (%; ILO estimate) (V6)	− 0.02	− 0.22	− 0.06	− 0.85	0.53	1.00	0.01	− 0.28	− 0.12	0.02	0.10	0.02	0.10	0.06	− 0.09
Political stability/no violence in origin country (V7)	0.62	0.01	− 0.56	− 0.02	− 0.00	0.01	1.00	0.01	− 0.92	− 0.82	− 0.00	0.76	− 0.63	0.00	0.62
Political stability/no violence in destination country (V8)	− 0.03	0.50	0.22	0.02	− 0.48	− 0.28	0.01	1.00	0.38	0.00	− 0.44	− 0.18	0.01	− 0.38	− 0.06
Difference in political stability/absence of violence (V9)	− 0.58	0.19	0.61	0.03	− 0.19	− 0.12	− 0.92	0.38	1.00	0.76	− 0.17	− 0.77	0.59	− 0.15	− 0.60
Political terror scale in origin country (V10)	− 0.55	0.00	0.51	− 0.03	− 0.01	0.02	− 0.82	0.00	0.76	1.00	0.01	− 0.92	0.64	− 0.02	− 0.63
Political terror scale in destination country (V11)	0.00	− 0.47	− 0.18	− 0.01	0.17	0.10	− 0.00	− 0.44	− 0.17	0.01	1.00	0.39	− 0.01	0.39	0.06
Difference in political terror scale (V12)	0.51	− 0.19	− 0.54	0.03	0.08	0.02	0.76	− 0.18	− 0.77	− 0.92	0.39	1.00	− 0.59	0.17	0.61
Freedom House indicator in origin country (V13)	− 0.51	0.01	0.47	− 0.12	− 0.00	0.10	− 0.63	0.01	0.59	0.64	− 0.01	− 0.59	1.00	0.01	− 0.99

Table 11 (continued)

Variable	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15
Freedom House indicator in destination country (V14)	0.01	− 0.47	− 0.19	− 0.00	0.11	0.06	0.00	− 0.38	− 0.15	− 0.02	0.39	0.17	0.01	1.00	0.13
Difference in Freedom House indicator (V15)	0.50	− 0.08	− 0.49	0.12	0.02	− 0.09	0.62	− 0.06	− 0.60	− 0.63	0.06	0.61	− 0.99	0.13	1.00

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