IFN Working Paper No. 1077, 2015

Pushed by Poverty or by Institutions? Determinants of Global Migration Flows

Andreas Bergh, Irina Mirkina and Therese Nilsson

Research Institute of Industrial Economics
P.O. Box 55665
SE-102 15 Stockholm, Sweden
info@ifn.se
www.ifn.se

Pushed by Poverty or by Institutions?
Determinants of Global Migration Flows

Andreas Bergh · Irina Mirkina · Therese Nilsson

Abstract The existing literature on determinants of migration flows typically claims that income differences across countries should be a pushing factor for people's movement. We suggest that institutional quality is a better proxy for the factors that trigger migration. People may well want to stay in or move to relatively poor countries if institutions are good, partly because good institutions have an intrinsic value for people and partly because good institutions may be a sign of future economic growth. In contrast, low income and absolute poverty work both as push-factors and as credit constraints, so that people may want to leave, but few can afford to migrate when poverty is high. We test our hypotheses using new data on bilateral migration flows from Abel and Sander (2014), the Worldwide Governance Indicators and the World Bank data on headcount poverty, using a migration gravity model with a spatial specification. Controlling for both source and destination income levels, we find that institutional quality matters significantly for migration. Poor institutions act as a push factor, while absolute poverty in a country of origin limits migration. We also find that omitting spatial factors biases the effect of institutions upwards.

JEL Codes F1 · F22 · P48

Keywords Global migration · institutions · poverty · gravity model · spatial analysis

---

A. Bergh, Department of Economics, Lund University, P.O. Box 7082, SE–220 07 Lund, Sweden; and The Research Institute of Industrial Economics (IFN), Sweden.
e-mail: andreas.bergh@nek.lu.se

I. Mirkina, Department of Economics, Lund University, P.O. Box 7082, SE–220 07 Lund, Sweden.
Phone: +46-46-222 46 43
e-mail: irina_v.mirkina@nek.lu.se

T. Nilsson, Department of Economics, Lund University, P.O. Box 7082, SE–220 07 Lund, Sweden; and The Research Institute of Industrial Economics (IFN), Sweden.
e-mail: therese.nilsson@nek.lu.se

Financial support from the Swedish Research Council and Torsten Söderberg's Foundation (Bergh & Nilsson) and the Swedish Institute (Mirkina) is gratefully acknowledged.

1 Introduction

This paper analyzes global migration flows to examine whether people tend to leave countries with low institutional quality in favor of countries with better institutions, as well as the role of absolute poverty. International migration is increasingly recognized as an important economic issue. Movement of people across national borders increases year after year, leading to shifts in labor productivity and market size. Estimates suggest that the global flows of people are very dynamic and that there has been a stable intensity of global migration flows at 0.6 % of the world population every fifth year since the mid 1990's. Figure 1a and Figure 1b illustrate that migration flows have increased over time, but also that a substantial part of global migration is not about moving to the relatively rich OECD countries (Abel and Sander 2014).

(Figure 1a and Figure 1b—about here)

At the same time, national policies towards migration have been a major point of debate for decades. Clemens (2011) famously suggested that constraints on migration from poor to richer countries may be the greatest single class of distortions in the global economy. Hamilton and Whalley (1984) used data from 1977 to argue that the annual gains from free labor mobility might significantly exceed global GNP. More recent estimates have revised the gains from free movement of labor substantially upwards (Moses and Letnes 2004, Docquier et al. 2015). In these papers, the gains from migration are large because there are large differences in the marginal productivity of labor across regions and countries. A comprehensive literature suggests that differences in labor productivity depend on differences in institutional quality, though there is no agreement on the relative importance of different aspects of institutions (cf. Rivera-Batiz 2002, Walmsley and Winters 2005, Borjas 2000).

Another strand of economics literature analyzes the determinants of migration flows (Borjas 1987, Clark et al. 2007, Mayda 2010). The gravity model framework—traditionally used to analyze trade flows—has been successfully adapted for this purpose (Lewer and Van den Berg 2008, Karemera et al. 2000, Beine et al. 2014, Ariu et al. 2014, Poprawe 2015). A puzzle noted by several scholars, however, is that push-factors corresponding to the traditional theoretical view—that migration decisions depend mainly on labor market factors and that people move to seek higher wages—do not seem to matter very much empirically.

One of the most recent studies on the determinants of migration uses the World Bank bilateral migration data as evidence for the claim that corruption appears to be a push factor for migration (Poprawe 2015). Still, institutional impact is not limited to corruption perceptions. In an unpublished paper, Ariu et al. (2014) take a broader perspective by using the Worldwide Governance Indicators in application to a dataset from Docquier et al. (2012) to conclude that high-skilled migrants are more interested in good institutions, but low-skilled workers may suffer more from bad governance and have more incentives to leave their country of origin. Both studies rely on a cross-country analysis: Poprawe (2015) uses the migration stock for the year 2000 as a dependent variable, while Ariu et al. (2014) use the net difference in stocks between 1990 and 2000.

As seen in Figure 1a and Figure 1b, migration patterns change dramatically over time. It is thus essential to explore the time dimension when drawing conclusions about the effect of changes in corruption or governance quality on migration. Moreover, any analysis may be incomplete if not accounting properly for the role of credit constraints and for the global trends of people's movement. We extend the scope of research and fill a gap in the existing literature by using a novel dataset providing information on global migration flows for the period 1990–2010 between

a majority of all countries in the world (Abel and Sander 2014), by analyzing several institutional indicators, controlling for absolute poverty as a proxy for financial constraints and by adding a spatial specification to isolate the impact of overall migration trends.

To explore the determinants of global migration flows, we test the following hypotheses:

1) Institutions matter for migration mainly as a push factor,

2) The effect of poverty on migration is twofold: low income may be a push-factor for potential migrants, but it can also restrict their ability to move,

3) The role of institutions varies across the levels of economic development, and

4) People's movement follows common patterns of migration from or to the neighboring states.

Regarding the first hypothesis, Bertocchi and Strozzi (2008) show that migration decisions are made over a long horizon. We suggest that an individual's migration decision depends more on expectations about future income levels than on current income levels. Making a choice whether to stay or to leave, people assess their own potential economic gains, but also take into account the future of their off-springs. Future income levels and future country developments is generally well proxied by current levels of institutional quality (Robinson et al. 2005). Our analysis therefore includes several measures of institutional quality as push- and pull-factors. Institutional quality is arguably a better proxy (than current income levels) for the determinants that trigger migration and should matter just as much as the levels of income. People may well want to stay in relatively poor countries if institutions there are good, among other things—because accountable and effective institutions are prerequisites of a faster economic growth. People may also want to move to a country with better institutions even if not receiving substantial economic

gains, because a higher level of institutional quality is associated with better social and economic conditions for their off-springs.[1]

Institutional quality is multidimensional, and thus institutions may improve in some aspects, but not in others. Some institutions may matter more for migration decisions than others. For example, it is likely that the level of corruption in an economy captures an institutional dimension that is more relevant for people's everyday life than more abstract dimensions (such as rule of law or regulatory quality), and thus that corruption is relatively more important for an individual. Low corruption reduces complexity and uncertainty of a routine decision making, while the rigorousness of contract enforcement is not something that regularly and directly affects an ordinary person. From a theoretical perspective, it is also reasonable to assume that voice and accountability and the extent that people feel that they are part of selecting their government and everyday freedom of expression would have a larger impact on the migration decision than people's perception of the more complex institutional measures, for instance, regulatory quality and government's ability to formulate and implement sound policies.

Regarding the second hypothesis, Beine et al. (2014) note that using current income levels as push- and pull-factors in the context of gravity models of migration might be problematic, since low average income in a country may work as a push-factor while at the same time acting as a credit constraint, so that fewer people can afford to migrate. For every individual, the costs of migration (including all aspects of moving out from a country of origin and settling down in a country of destination) should be on par with the available to her financial resources. Until a

[1] A related question is whether immigration impacts institutions in the destination country. So far there is no consensus about this in the existing literature, though Clark et al. (2015) show that immigration has little to no effect on economic freedom in destination countries.

certain level of financial reserves is reached, credit constrains would prevent people from migrating, even if they are willing to do so.[2]

In the previous migration literature, credit constraints are typically accounted for by using higher-order terms of income per capita in the country of origin (Yang 2006, Pedersen et al. 2008, Mayda 2010) or by splitting the sample by the very same indicator (Ortega and Peri 2013). In contrast to other papers, we argue that, in order to fully capture the role of credit constraints, the level of absolute poverty in an origin country must be taken into account. Not properly accounting for poverty may otherwise blur the effect of income factors.

Our next hypothesis is that there is heterogeneity with respect to the determinants of migration across developmental contexts. We therefore analyze the relationship of interest using a pooled sample of countries, but also split the data into subsamples of OECD and non-OECD countries. Based on Figure 1a and Figure 1b, the extent of non-OECD migration is not trivial in size and has increased over time. Yet, the existing literature generally focuses on immigration to OECD countries, mainly due to the better data availability (cf. Artuc et al. 2015). Even studies on global migration flows, dividing origins and destinations into "global North" (relatively rich countries) and "global South" (all the rest), primarily draw conclusions for the South-North direction (cf. Özden et al. 2011, Ariu et al. 2014). A sub-sample analysis also helps us to avoid what Blonigen and Wang (2004) label as *inappropriate pooling of wealthy and poor countries*, which presumably may skew empirical results: Differences in the levels of income between rich countries of destinations and less developed countries of origin may explain the incoming OECD migration, but not the global patterns. Moreover, separating between OECD and non-OECD

[2] War refugees and seekers of political asylum might have various reasons to migrate, regardless of credit constrains, but investigation of this issue is out of the scope of this paper.

countries seems reasonable, since the former group generally has more restrictive immigration laws.

Our final hypothesis relates to one of the most intriguing parts of the migration puzzle, namely two common spatial patterns in the movement of people across all countries:

1) people's choice of a destination country with respect to immigration to all other possible destinations, and

2) people's decision to leave their origin country with respect to the intensity of emigration from all other origin countries.

Presence of both of these patterns implies that people from the same geographic cluster of countries are more likely to move in the same direction, in turn having implications on how to properly model migration flows. If there is migration from China to North America, then one would expect the same pattern of migration from other countries in East and Southeast Asia, and when observing an increase or decrease in migration to Sweden from the Balkans, one would expect to see the same pattern of migration into other Scandinavian countries. Migration flows for any pair of countries are likely to change along with some global trends and are not isolated from the rest of the world.

While spatial analysis is close in reasoning to a more traditional network analysis in migration studies (e.g., Rotte et al. 1997, Beine et al. 2011), which accounts for people moving to the countries where their co-nationals are already present, they differ empirically. First, migrant networks do not necessarily correspond to national borders. While the presence of past migrants from the same country reduces the information and transaction costs for potential migrants, the presence of migrants with a similar cultural or linguistic background, although coming from

another country, might be just as important. For instance, if people from Argentina, who moved to Spain, support not only fellow Argentinians, but also the Latin-American community in a broader sense, this might facilitate migration to Spain from Uruguay, Bolivia, or Chile.

Second, while the presence of established networks might facilitate an individual's move, we argue that the presence of migrant groups can also be a sign that the conditions and costs of migration to that specific country are considered acceptable by other people. If migration between two countries increases, it is likely that people are pushed or pulled by the same factors as other people (not necessarily their fellow nationals) before them. For instance, when people move from India to the USA, they might do so because other Indians did the same or because people originating in many countries across the globe move to the USA (see Figure 1a and Figure 1b). Using a spatial model allows us to differentiate the trend of migration for a given pair of countries from the overall trends of migration. Finally, the costs of migration are likely to be similar for countries that are geographically close to one another, but their push- and pull-factors may differ. Thus, it is reasonable to analyze bilateral migration flows not only independently from the rest of the world, as in a conventional gravity model, but also with regard to the trends of migration for the countries, neighboring respectively every country of origin and every country of destination. To draw conclusions about the existence of common trends in migration flows, we should compare the flows, for example, between France and the United Kingdom to the flows from France to other countries, from the UK to other countries, from other countries to France, and from other countries to the UK.

Our results are derived by fitting a gravity model using the Poisson pseudo-maximum likelihood estimator and controlling for the Worldwide Governance Indicators in both origin and destination countries, in addition to the usual set of controls. Importantly, we find that spatial trends matter

and lead to smaller coefficients on institutional indicators. Still, we find that migration flows depend significantly on institutional quality, also when controlling for the source and destination's levels of income. Our results also clearly suggest that higher absolute poverty prevents people from leaving their origin country. Overall, we find substantial support for the idea that people are pushed to migrate, not by low incomes, but by poor institutions.

2 Methods and Data

2.1 Methods

Originally introduced by Tinbergen (1962), gravity models have been widely used for analyzing trade flows and investment in the past few decades. Following developments by Anderson (1979), Helpman and Krugman (1985), and Deardorff (1998) among many others, they have become a staple of the trade research since Anderson and van Wincoop (2003).[3] The idea of the gravity force, applied to describe interactions among countries, postulates that bigger economies have more influence over smaller economies (where the size of the economies is usually defined in terms of their population or GDP) and that neighboring states are connected to one another more closely than the states far apart.

Since there appears to be both push and pull factors affecting the migration decision, gravity models and bilateral modeling have recently also been used to analyze migration patterns (for a review, see Beine et al. 2014). The gravity equation for migration in its simplest form states that

[3] Specific applications of a gravity model (cross-section versus panel data, structural versus non-structural estimates, model for multiple sectors versus multiple products, etc.) were derived in numerous studies for trade in services (for review, see Egger et al. 2012), capital flows (see Okawa and van Wincoop 2013), foreign direct investment (see Leibrecht and Riedl 2014), and remittances of migrants (see Docquier et al. 2012).

the migration flows from country *i* to country *j*, M_{ij}, are proportional to the product of the two countries' income, denoted by I_i and I_j, and inversely proportional to the broadly defined costs of migration, C_{ij}, typically proxied by geographic and cultural remoteness of these countries from each other. Anderson and van Wincoop (2003) suggest adding fixed effects for both countries to account for the unobservable multilateral resistance terms, resulting in a traditional gravity equation for migration:

$$M_{ij} = \alpha_0 I_i^{\alpha_1} I_j^{\alpha_2} C_{ij}^{\alpha_3} e^{\theta_i F_i + \theta_j F_j} \quad (1)$$

where α_0, α_1, α_2, α_3, θ_i, and θ_j are the parameters to be estimated and F_i and F_j are dummies identifying the origin and destination countries.

Anderson and van Wincoop (2003) demonstrate that the multiplicative gravity equation (1) can be estimated in log-linear form. Expanding this model to include all the factors that affect an individual's decision to migrate according to the theoretical foundations discussed in the previous section, leads to:

$$\ln M_{ij} = \alpha + \beta_1 IQ_i + \beta_2 IQ_j + \gamma_1 \ln G_i + \gamma_2 \ln G_j + \delta \ln d_{ij} + \varphi P_{ij} + F_i + F_j + \ln \varepsilon_{ij} \quad (2)$$

where *IQ* stands for institutional quality in origin country *i* and destination country *j*, ln*G* denotes the log of GDP per capita in the two countries, lnd_{ij} is the log of distance between origin and destination countries, weighted by their population, P_{ij} is a vector of conventional dyadic covariates, accounting for the proximity of origin and destination countries to each other (common border, colonial links, language ties, similar legal system), F_i and F_j are fixed effects for origin and destination country respectively, and ε_{ij} is the error term.

There are two empirical problems in the application of equation (2). First, estimation of equation (2) using OLS raises the problem of heteroskedasticity of the error term in log-linear form

(Santos Silva and Tenreyro 2006, Head and Mayer 2013), which violates the assumption that ln ε_{ij} is statistically independent of the regressors and leads to inconsistent estimates for all the regressors. Another empirical problem appears due to the fact that bilateral data used in trade, investment, and migration research, generally contain a non-trivial amount of zeroes.[4] Many early gravity studies drop zero observations from the estimation, presuming that only the effect of covariates on existing, i.e., non-zero, observations is economically meaningful. We follow another tradition, interpreting zeroes as a potential signal that the costs of migration between a pair of countries might be too high with respect to existing migration flows among other countries. As discussed in the previous section, every individual has credit constraints, and her decision to migrate depends on the fixed costs of moving from country *i* and settling down in country *j*. We observe zero migration in the case when these costs are so high that no individual from country *i* could afford a move to country *j*. Empirically though, this prominent data characteristic would also lead to inconsistent parameter estimates in case we would choose to estimate the model using log-linear OLS (Santos Silva and Tenreyro 2006, Anderson 2011, Baltagi et al. 2014).[5]

Santos Silva and Tenreyro (2006) propose using a Poisson pseudo-maximum likelihood estimator (PPML) in the gravity context, demonstrating its ability to produce unbiased estimates in the presence of both heteroskedasticity and a high share of zero observations. Head and Mayer (2013) compare the performance of several methods, including OLS, Tobit, PPML, Gamma

[4] This applies to our study as well: out of 142,884 observations, only 45,586 observations have $M_{ij} > 0$. This corresponds to 68 per cent zero-values for migration flows.

[5] Anderson (2011) shows that the OLS estimates remain inconsistent even if a small positive constant is added to the variable on the left-hand side, which would typically allow log-linearization of the model, containing zero-value observations. If the data have many zeroes, the error term must have a substantial mass at very small values, violating the normal distribution assumption.

PML, and Multinomial PML, showing that PPML provides consistent estimates under a very general assumption that the conditional variance is proportional to the conditional mean, which allows for both under- and over-dispersion in the data.[6] To estimate PPML, the gravity model of migration takes exponential form

$$M_{ij} = \exp\left(\alpha + \beta_1 IQ_i + \beta_2 IQ_j + \gamma_1 \ln G_i + \gamma_2 \ln G_j + \delta \ln d_{ij} + \varphi P_{ij} + F_i + F_j\right) u_{ij} \qquad (3)$$

$$\text{with } Var\left(M_{ij}|Z\right) \propto E\left(M_{ij}|Z\right)$$

where u_{ij} is the multiplicative error term, and Z denotes a vector of all the covariates.

An important extension of the gravity model in equation (3) follows our theoretical expectations: migration flows for any given pair of countries are not isolated from the rest of the world. LeSage and Dominguez (2012) show that use of spatial lag models in the face of spatially dependent omitted variables also helps to minimize the bias. Thus, we check the presence of the two spatial patterns discussed above, by augmenting model (3) with two spatial lags:

$$M_{ij} = \exp(\alpha + \rho_1 \sum_{k \neq i} w_{pq} M_{kj} + \rho_2 \sum_{m \neq j} w_{pq} M_{im} + \beta_1 IQ_i + \beta_2 IQ_j + \\ + \gamma_1 \ln G_i + \gamma_2 \ln G_j + \delta \ln d_{ij} + \varphi P_{ij} + F_i + F_j) u_{ij} \qquad (4)$$

where $\sum_{k \neq i} w_{pq} M_{kj}$ is a specific source spatial contagion, accounting for spatial effect of other origin countries *k* on destination country *j*, and $\sum_{m \neq j} w_{pq} M_{im}$ is a specific target spatial contagion, accounting for spatial effect of other destination countries *m* on origin country *i*.

[6] Some gravity studies, including Poprawe (2015), reported results based on the negative binomial estimator, which encompasses the Poisson assumption as a special case. Bosquet and Boulhol (2010) show that the negative binomial estimator is inappropriate when applied to a continuous dependent variable, which unit choice is arbitrary, because estimates artificially depend on that choice. We check the robustness of our results, using the GLM negative binomial estimator, suggested by Bosquet and Boulhol (2014). The results are available upon request.

Following the discussion in LeSage and Pace (2008), we construct the spatial terms, using a weight matrix w_{pq}, based on the inverse squared distance between the centroids of all origin countries p and all destination countries q, so that the closer two countries are, the higher weights they receive for each other.[7] A specific source spatial contagion would then identify the weighted effect of migration flows from the pool of origin countries ($k \neq i$) to destination country j, and a specific target spatial contagion would identify the weighted effect of migration flows from origin country i to the pool of destination countries ($m \neq j$). Barthel and Neumayer (2015) point out that a statistically significant coefficient of a spatial lag does not necessarily indicate a causal relationship between the dependent variable and its spatial lag, but might rather represent common trends and observation-specific dynamics, which confound the effect of spatial dependence. We see it as an advantage rather than as a problem, since we are primarily interested in the effect of institutional quality, and include spatial lags precisely to account for spatial clustering and unobserved spatial heterogeneity across countries that might otherwise lead to overestimation of dyad-specific effects.

As discussed in the theoretical section, yet another empirical concern is whether the relationship between institutional quality and migration is similar across development contexts. Particularly, it is relevant to test whether there is heterogeneity across types of economies, when investigating reasons for migration beyond poverty. In the following analysis we therefore test the relationship between institutional quality and migration both in a pooled sample and for a sub-sample of non-OECD countries.

[7] Weight of each country for itself is zero, so that none of the countries is its own neighbor in the spatial contagions.

2.2 Data

To analyze the relationship between institutional quality and migration, we use bilateral migration flows, collected from a new dataset produced by Abel and Sander (2014). One of the major issues in migration studies so far has been the lack of reliable data on migration flows outside of OECD countries. A few sources of the global data focus primarily on migration stock, measured as the number of people living in a country other than their country of birth. The World Bank provides one such comprehensive dataset with information about international bilateral migration stock for 226 by 226 country pairs for the period 1960–2000 (Parsons et al. 2007, Özden et al. 2011), later expanded to include the year 2010 (Ratha et al. 2011, World Bank 2013). The UN Population Division maintains another database on global migration stock since 1960, although it covers fewer countries. Artuc et al. (2015) create yet another dataset of bilateral migration stocks for non-OECD countries, based on the available data from OECD countries, for the period 1990–2000. Using stock data in the same way as flows can however be misleading due to the fact that the size of immigrant population does not match the movement of people. Estimation within the gravity context does not allow straightforward interpretation of the effects of covariates on the original stock data, which merely represent the cumulative number of immigrants. Typically, one way to deal with it would be use of net migration inflows, computed as differences in stocks, but then another problem arises: global migration stock data from any source are only available with 10-year intervals. Such long gaps in the data may blur the results of an analysis, as they do not account for any short-term changes.

All of the above listed factors contributed to an increasing demand for the bilateral migration flows data. Abel (2013) provides an estimation of international flows, based on the World Bank's stock data for the period 1960–2000. Still, one should be careful comparing the migration data

from before and after 1990—due to the changes of national borders over time and even different methodologies for counting migrants. We, therefore, employ the new dataset by Abel and Sander (2014), who provide reliable and consistent estimates of migration flows, based on the UN Population Division stock data.[8] This dataset has several advantages for our analysis. First, it offers a comprehensive coverage: estimations of bilateral flows are available for 192 by 192 country pairs for the period 1990–2010. Second, the underlying data are consistent throughout the years and across countries, as they are based on the UN Population Division methodology. Third, Abel and Sander (2014) provide estimates for five-year periods, which allow us to capture short-term trends.

To analyze the impact of institutional quality, we rely on the Worldwide Governance Indicators (Kaufmann et al. 2005, 2010), describing six dimensions of institutions: *government effectiveness*, *control of corruption*, *regulatory quality*, *rule of law*, *political stability*, and *voice and accountability*. The Worldwide Governance Indicators (WGI) fit well for our purposes both empirically and methodologically. First, they provide a great coverage of countries, estimating quality of governance in more than 190 countries every year since 1996. Second, they feature the scores for various dimensions of governance, while most of the other institutional quality assessments focus only on one or two dimensions, usually—on control of corruption or political stability. Third, they combine information from several independent sources, placing that information onto a unified scale. While country comparisons are often impossible if information about the quality of their institutions comes from different sources and have different scales, the WGI extracts information from all those sources, transforming their scales so that every indicator

[8] We also repeat our analysis using net migration flows, computed as differences in migration stock from the World Bank data (World Bank 2013) for 225 by 225 country pairs for the same period. The results are available upon request.

is constructed as a normally-distributed random variable with zero mean, unit standard deviation, and ranging approximately from −2.5 to 2.5. Fourth, the WGI employ an unobserved components model to estimate the scores together with the margins of error, providing a more innocuous way to make comparisons over time and across countries, than most of the other sources, which publish only absolute scores.[9] Appendix A1 contains the description of the six indicators of the WGI, as well the sources behind them.

While we expect people to stay in or to be driven into countries with better institutional quality, we do not expect all types of institutions to have an effect of the same sign and magnitude. As previous studies (Berden et al. 2014, Bergh et al. 2014) show, various dimensions of institutional quality are connected to the movement of people, economic flows, and ideas in different ways, and therefore may have different degrees of importance for one's decision to migrate.

In addition to institutional variables we include data on countries' geographic proximity (*weighted distance between their capitals* and *a contiguity matrix*), as well as their cultural and historical ties (if a pair of countries share a *common language, common colonial past,* and *common legal origin*) to account for interconnectivity across countries. These covariates for estimating a gravity model come from the GeoDist database by CEPII (Mayer and Zignago 2011).

We further use *GDP per capita* (PPP adjusted, in constant US dollars) of both origin and destination countries as a measure of income differences between them. These data come from the World Development Indicators Database (World Bank 2014a). Finally, we include

[9] Ariu et al. (2014) in an unpublished study use gaps in the WGI between origin and destination countries as institutional indicators. Kaufmann et al. (2010) advise against such a strategy, since, due to the measurement issues, many of the small differences in estimates of governance across countries are not likely to be statistically significant.

information on headcount poverty in origin countries from the Poverty and Inequality Database (World Bank 2014b). This variable refers to the percentage of population in a country living on less than two dollars a day (PPP adjusted) and is derived from household surveys.

The resulting bilateral dataset contains information for origins and destinations of international migration for 189 by 189 country pairs for five-year periods between 1990 and 2010. Table 1 shows descriptive statistics for the variables of interest.

(Table 1—around here)

3 Results

As a preliminary check of the data and model specification, we first analyze the role of institutions as migration determinants in a gravity model without spatial effects for the global sample (Table 2). The same specification without OECD-countries is shown in the appendix (table A2). The standard control variables all have the expected sign. There is less migration between countries that are more distant from each other, and more migration between neighboring states. Having a common language and sharing colonial past significantly facilitate migration between countries, while the effect of a common legal origin is positive but not significant.

GDP per capita in a country of origin generally has a positive sign, but is rarely statistically significant. The effect of GDP per capita in a country of destination is always negative (and statistically significant without OECD-countries, as shown in table A2). These results confirm that income levels are poor proxies for push and pull factors that explain migration. Institutional quality in a country of origin seems to act as a strong push-factor, i.e., discontent with the current

quality of institutions makes people willing to leave a country, and for most indicators the push-effect is stronger than the pull effect. One puzzling finding is that strict rule of law and government accountability in destination countries seem to discourage migration. Also, the effect of political stability in destination countries is never statistically significant. In general, and in line with our expectations, institutions matter mainly as push-factors.

(Table 2—around here)

Table 3 presents our preferred model that controls for spatial effects for both origin and destination countries, including (but not showing) the same set of control variables as in table 2. Spatial effects are positive and statistically significant, indicating that people are more likely to leave their country of origin when emigration from neighboring countries increases. Similarly, immigration to a country will follow the trend of immigration to neighboring countries. Comparing table 2 and table 3, the coefficients on institutional indicators are smaller when controlling for spatial effects, though the pattern is the same: Bad institutions in origin countries have a pushing effect, regardless of whether OECD-countries are included or not, and all are highly significant, except for voice and accountability.

(Table 3—around here)

Finally, to specifically analyze the role of credit constraints, table 4 presents results for a spatial model when also including absolute poverty in origin countries. In this most complete specification, the coefficients of institutions in destination countries have the expected positive sign. As expected, poverty clearly prevents people from leaving their country of origin. Absolute poverty is higher in the sub-sample of non-OECD countries (with the headcount mean at 0.40 versus 0.29 in the global sample). The effect of poverty on migration flows in the non-OECD

sub-sample is weaker and less significant, which is likely explained by relatively lower costs of migration among non-OECD countries.

(Table 4—around here)

A great variety of both push- and pull-factors may be at work in the pairs of countries, where the potential migration flows are yet to become actual flows, because people who are willing to move could not do so until a certain level of prosperity is reached and poverty is reduced. We find that the effect of institutions on migration flows, conditional on poverty levels, remains consistent and significant, while also reveals the two-fold role of poverty as both a push-factor and as a migration constraint.

4 Concluding discussion

The worldwide international migrant stock increased from 154 million persons in 1990 to 232 million in 2013, which corresponds to a modest increase from 2.9 to 3.2 per cent of the world population (United Nations 2013). Many factors in both destination and origin countries play a major role in constraining migration flows, and many people would prefer to migrate but are unable to do so. Still, the gains from the existing movement of labor seem to be large due to the differences in marginal productivity of labor across countries—differences that may depend on institutional quality.

This paper takes a new perspective on the literature examining the determinants of migrations and suggests that institutional quality is a good proxy for the factors that trigger migration. We argue that the migration decision depends on the expectations about future income levels, for which institutions might serve as good proxies. We also take into account the dual role of

absolute poverty, which, on the one hand, might make people want to leave, but, on the other hand, represents real credit constraints, limiting migration.

Using a gravity model approach, the empirical analysis suggests that the quality of institutions matters as a push factor for migration, whether focusing on the movement of people in the world as a whole or only between non-OECD countries. Moreover, institutions that directly affect an individual's life, such as effective bureaucracy and control of corruption, act also as strong pull-factors for the countries of destination. This asymmetric effect of institutions is due to the fact that people, making a decision to migrate, have more information about their country of origin than about potential destinations. Another finding is that migration flows follow global trends, so that the waves of migration from or into a country trigger new migration also in the neighborhood. Finally, poverty might be an important push-factor along with the lack of effective and transparent institutions in developing context, but it also acts as credit constraints that seem to hinder global migration flows.

Acknowledgements

We wish to thank Christian Bjørnskov, participants at the Danish Public Choice workshop 2015 and the American Public Choice Society Meeting 2015 for helpful comments and suggestions. Financial support from the Swedish Institute (Mirkina), the Swedish Research Council (Bergh and Nilsson), and Söderberg's Foundation (Bergh and Nilsson) is gratefully acknowledged.

References

Abel, G. (2013). Estimating global migration flow tables using place of birth data. *Demographic Research*, 28(18), 505–546.

Abel, G. & Sander, N. (2014). Quantifying global international migration flows. *Science*, 343, 1520–1522.

Anderson, J. & van Wincoop, E. (2003). Gravity with gravitas: A solution to the border puzzle. *American Economic Review*, 93(1), 170–192.

Anderson, J. (1979). A theoretical foundation for the gravity equation. *American Economic Review*, 69(1), 106–116.

Anderson, J. (2011). The gravity model. *Annual Review of Economics*, 3(1), 133–160.

Ariu, A., Docquier, F. & Squicciarini, M. (2014). *Governance quality and net migration flows*. Mimeo.

Artuc, E., Docquier, F., Özden, Ç. & Parsons, C. (2015). A global assessment of human capital mobility: the role of non-OECD destinations. *World Development*, 65, 6–26.

Baltagi, B., Egger, P. & Pfaffermayr, M. (2014). Panel data gravity models of international trade. *CESifo Working Paper* 4616, Munich: CESifo Group.

Barthel, F. & Neumayer, E. (2015). Spatial dependence in asylum migration. *Journal of Ethnic and Migration Studies*, 41(7), 1131–1151.

Beine, M., Bertoli, S. & Fernández-Huertas Moraga, J. (2014). A practitioners' guide to gravity models of international migration. *CREA Discussion Paper* 2014-03. Luxembourg: Center for Research in Economic Analysis, University of Luxembourg.

Beine, M., Docquier, F. & Özden, Ç. (2011). Diaspora effects in international migration: key questions and methodological issues. *World Bank Policy Research Working Paper* 5721, Washington, DC: World Bank.

Berden, K., Bergstrand, J. H. & Etten, E. (2014). Governance and globalisation. *The World Economy*, 37(3), 353–386.

Bergh, A., Mirkina, I. & Nilsson, T. (2014). Globalization and institutional quality—A panel data analysis, *Oxford Development Studies*, 42(3), 365–394.

Bertocchi, G. & Strozzi, C. (2008). International migration and the role of institutions. *Public Choice*, 137(1–2), 81–102.

Blonigen, B. & Wang, M. (2004). Inappropriate pooling of wealthy and poor countries in empirical FDI studies. *NBER Working Paper* No. 10378. Cambridge, MA: National Bureau of Economic Research.

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

Borjas, G. (2000). *Labour economics*. 2nd Edition. Boston, MA: McGraw-Hill.

Bosquet, C. & Boulhol, H. (2010). *Scale-dependence of the Negative Binomial Pseudo-Maximum Likelihood Estimator*. Mimeo.

Bosquet, C. & Boulhol, H. (2014). Applying the GLM variance assumption to overcome the scale-dependence of the negative binomial QGPML estimator. *Econometric Reviews*, 33(7), 772–784.

Clark, J., Lawson, R., Nowrasteh, A., Powell, B. and Murphy, R. (2015). Does immigration impact institutions? *Public Choice*, 163, 321–335.

Clark, X., Hatton, T. J. & Williamson, J. G. (2007). Explaining US immigration, 1971–1998. *The Review of Economics and Statistics*, 89(2), 359–373.

Clemens, M. A. (2011). Economics and emigration: Trillion-dollar bills on the sidewalk? *The Journal of Economic Perspectives*, 25(3), 83–106.

Deardorff, A. (1998). Determinants of bilateral trade: Does gravity work in a neoclassical world? in J. Frankel (Ed.), *The Regionalization of the World Economy*. Chicago: University of Chicago Press.

Docquier, F., Machado, J. & Sekkat, K. (2015). Efficiency gains from liberalizing labor mobility. *The Scandinavian Journal of Economics*, 117(2), 303–346.

Docquier, F., Rapoport, H. & Salomone, S. (2012). Remittances, migrants' education and immigration policy: Theory and evidence from bilateral data. *Regional Science and Urban Economics*, 42(5), 817–828.

Egger, P., Larch, M. & Staub, K. (2012). Trade preferences and bilateral trade in goods and services: A structural approach. *CEPR Discussion Paper* 9051, London: C.E.P.R.

Hamilton, B. & Whalley, J. (1984). Efficiency and distributional implications of global restrictions on labour mobility: Calculations and policy implications. *Journal of Development Economics*, 14(1), 61–75.

Head, K. & Mayer, T. (2013). Gravity equations: Workhorse, toolkit, and cookbook. *CEPII Working Paper* 2013-27. Paris: Centre d’études prospectives et d’informations internationales (CEPII).

Helpman, E. & Krugman, P. (1985). *Market structure and foreign trade: Increasing returns, imperfect competition, and the international economy*. Cambridge, MA, and London: The MIT Press.

Karemera, D., Oguledo, V. & Davis, B. (2000). A gravity model analysis of international migration to North America. *Applied Economics*, 32(13), 1745–1755.

Kaufmann, D., Kraay, A. & Mastruzzi, M. (2005). Governance matters VIII: Aggregate and individual governance indicators 1996–2008. *World Bank Policy Research Working Paper* 4978. Washington, DC: World Bank Group.

Kaufmann, D., Kraay, A. & Mastruzzi, M. (2010). The Worldwide Governance Indicators: Methodology and analytical issues. *World Bank Policy Research Working Paper* 5430. Washington, DC: World Bank Group.

Leibrecht, M. & Riedl, A. (2014). Modeling FDI based on a spatially augmented gravity model: Evidence for Central and Eastern European Countries, *The Journal of International Trade & Economic Development*, 23(8), 1206–1237.

LeSage, J. & Dominguez, M. (2012). The importance of modeling spatial spillovers in public choice analysis. *Public Choice*, 150(3–4), 525–545.

LeSage, J. & Pace, R. (2008). Spatial econometric modeling of origin-destination flows. *Journal of Regional Science*, 48(5), 941–967.

Lewer, J. & Van den Berg, H. (2008). A gravity model of immigration. *Economics Letters*, 99(1), 164–167.

Mayda, A. (2010). International migration: A panel data analysis of the determinants of bilateral flows. *Journal of Population Economics*, 23(4), 1249–1274.

Mayer, T. & Zignago, S. (2011). Notes on CEPII's distances measures: the GeoDist Database. *CEPII Working Paper* 2011-25. Paris: Centre d'études prospectives et d'informations internationales (CEPII).

Moses, J. & Letnes, B. (2004). The economic costs to international labor restrictions: Revisiting the empirical discussion. *World Development*, 32(10), 1609–1626.

Okawa, Y. & van Wincoop, E. (2013). Gravity in international finance. *Journal of International Economics*, 87(2), 205–215.

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

Özden, Ç., Parsons, C., Schiff, M. & Walmsley T. (2011). Where on Earth is everybody? The evolution of global bilateral migration, 1960–2000. *World Bank Economic Review*, 25(1), 12–56.

Parsons, C., Skeldon, R., Walmsley, T. & Winters, L. (2007). Quantifying international migration: A database of bilateral migrant stocks. *World Bank Policy Research Working Paper* 4165. Washington, DC: World Bank Group.

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

Poprawe, M. (2015). On the relationship between corruption and migration: empirical evidence from a gravity model of migration. *Public Choice*, 163(3–4), 337–354.

Ratha, D., Mohapatra, S. & Silwal, A. (2011). *Migration and Remittances Factbook 2011*. Washington, DC: World Bank Group.

Rivera-Batiz, F. (2002). Democracy, governance, and economic growth: Theory and evidence. *Review of Development Economics*, 6, 225–247.

Robinson, J., Acemoglu, D. & Johnson, S. (2005). Institutions as a fundamental cause of long-run growth. in P. Aghion and S. Durlauf (Eds.), *Handbook of Economic Growth*. Amsterdam: Elsevier.

Rotte, R., Vogler, M. & Zimmermann, K. (1997). South-North refugee migration: Lessons for development cooperation. *Review of Development Economics*, 1(1), 99–115.

Santos Silva, J. & Tenreyro, S. (2006). The log of gravity. *The Review of Economics and Statistics*, 88(4), 641–658.

Tinbergen, J. (1962). *Shaping the World Economy*. New York: Twentieth Century Fund.

United Nations (2013). The number of international migrants worldwide reaches 232 million. *Population Facts* 2013/2. New York, NY: United Nations Population Division.

Walmsley, T. & Winters, A. (2005). Relaxing the restrictions on the temporary movement of natural persons: A simulation analysis. *Journal of Economic Integration*, 20, 688–726.

World Bank. (2013). *Global Bilateral Migration Database*. Washington, DC: World Bank Group.

World Bank. (2014a). *World Development Indicators Database*. Washington, DC: World Bank Group.

World Bank. (2014b). *Poverty and Inequality Database*. Washington, DC: World Bank Group.

Yang, D. (2006). Why do migrants return to poor countries? Evidence from Philippine migrants' responses to exchange rate shocks. *The Review of Economics and Statistics*, 88(4), 715–735.

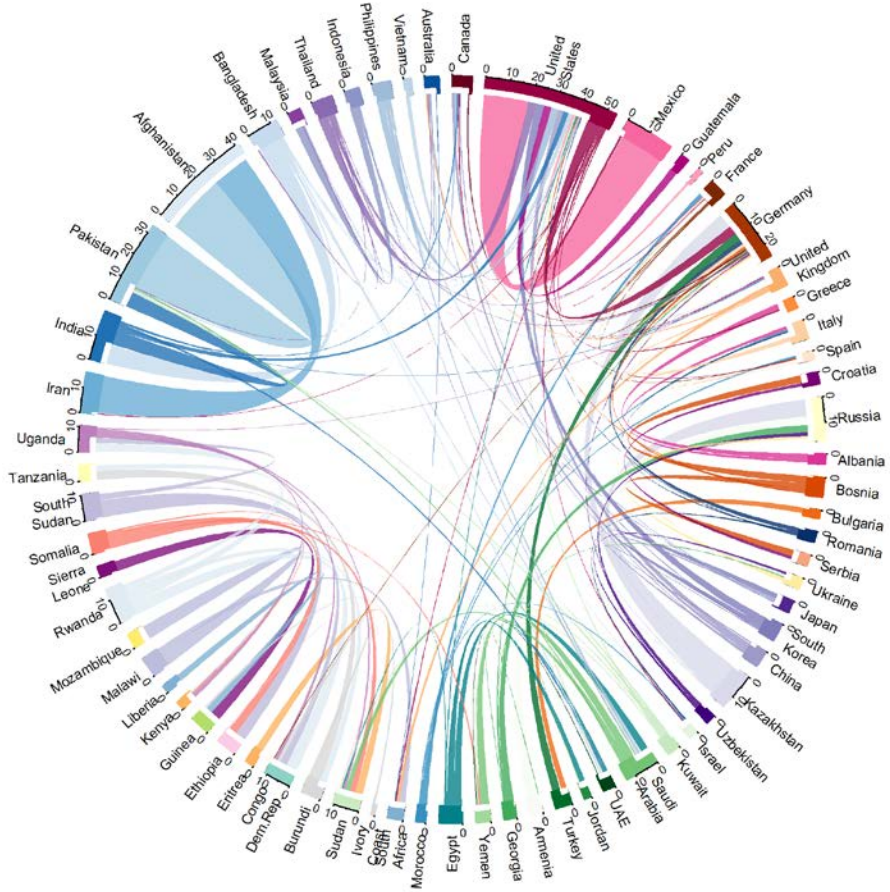

Figure 1a. Global migration flows in 1990–1995

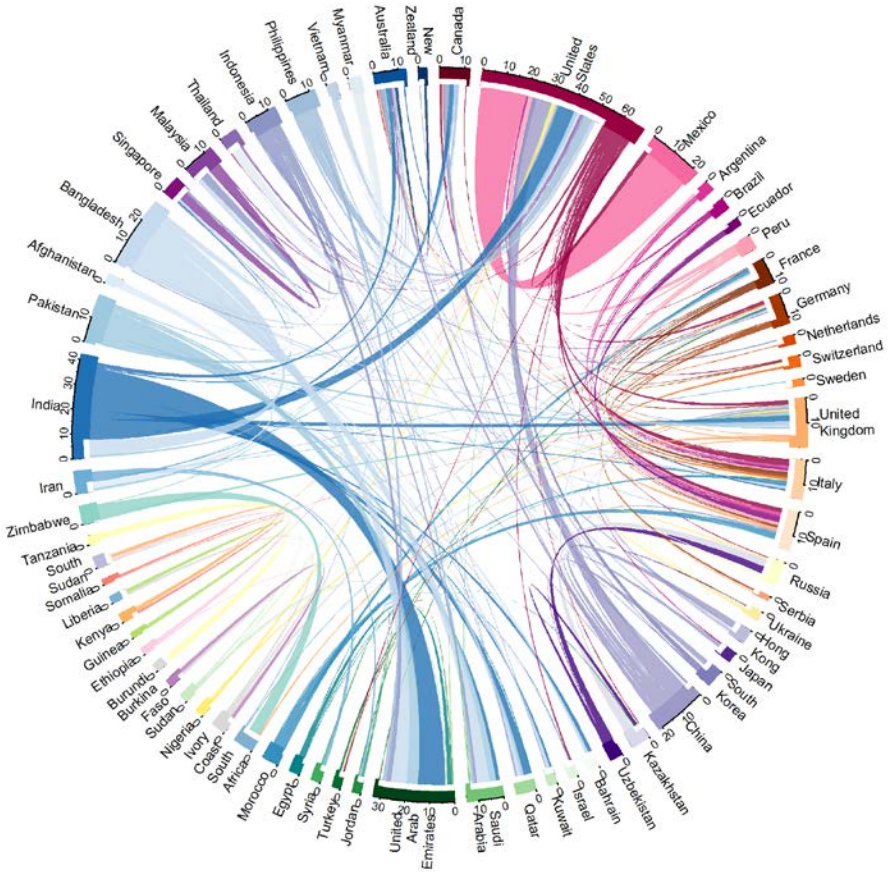

Figure 1b. Global migration flows in 2005–2010

Note: 1 unit equals 10,000 persons. Only flows of more than 30,000 persons are displayed. Data from Abel & Sander (2014)

Table 1. Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max	Sources
Migration flows (1000s)	142884	1.077	18.724	0	2677.76	Abel and Sander (2014)
Spatial source contagion	142884	0.932	5.792	0	504.50	Authors' calculation
Spatial target contagion	142884	0.880	5.176	0	534.96	Authors' calculation
Log of GDP per capita	133245	7.976	1.620	3.933	11.301	World Bank (2014a)
Log of distance	135424	8.735	0.812	1.058	9.886	Mayer & Zignago (2011)
Contiguity	135424	0.018	0.131	0	1	Mayer & Zignago (2011)
Common language	135424	0.132	0.339	0	1	Mayer & Zignago (2011)
Common colonial heritage	135424	0.097	0.295	0	1	Mayer & Zignago (2011)
Common legal origin	135408	0.323	0.468	0	1	Mayer & Zignago (2011)
Poverty headcount ratio at $2 a day	87507	0.292	0.319	0	0.954	World Bank (2014b)
Government effectiveness	137403	-0.063	1.008	-2.325	2.255	Kaufmann et al. (2010)
Control of corruption	137403	-0.069	1.014	-2.057	2.586	Kaufmann et al. (2010)
Political stability	138348	-0.131	0.987	-3.106	1.668	Kaufmann et al. (2010)
Regulatory quality	137592	-0.058	0.999	-2.536	2.247	Kaufmann et al. (2010)
Rule of law	138915	-0.112	0.996	-2.448	1.977	Kaufmann et al. (2010)
Voice and accountability	139104	-0.113	0.994	-2.218	1.768	Kaufmann et al. (2010)

Table 2. The effect of institutions on migration flows (full sample, non-spatial specification)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
GDP p.c. – destination	-0.372	-0.576*	-0.448	-0.680**	-0.285	-0.467	-0.309
	(0.317)	(0.294)	(0.281)	(0.314)	(0.307)	(0.296)	(0.304)
GDP p.c. – origin	0.111	0.556**	0.124	0.391*	0.230	0.0980	-0.00190
	(0.249)	(0.247)	(0.225)	(0.238)	(0.239)	(0.225)	(0.235)
Distance	-0.975***	-0.978***	-0.976***	-0.978***	-0.972***	-0.973***	-0.974***
	(0.0511)	(0.0513)	(0.0513)	(0.0512)	(0.0511)	(0.0512)	(0.0512)
Contiguity	1.563***	1.553***	1.554***	1.551***	1.565***	1.564***	1.563***
	(0.147)	(0.147)	(0.147)	(0.147)	(0.148)	(0.147)	(0.147)
Common language	1.055***	1.057***	1.058***	1.063***	1.054***	1.055***	1.054***
	(0.123)	(0.123)	(0.123)	(0.122)	(0.123)	(0.122)	(0.123)
Common colonial past	0.777***	0.771***	0.775***	0.778***	0.777***	0.777***	0.778***
	(0.172)	(0.171)	(0.172)	(0.171)	(0.172)	(0.171)	(0.172)
Common legal origin	0.0584	0.0582	0.0587	0.0570	0.0571	0.0565	0.0574
	(0.0894)	(0.0894)	(0.0895)	(0.0893)	(0.0895)	(0.0892)	(0.0894)
Government effectiveness		0.407**					
– destination		(0.171)					
Government effectiveness		-1.199***					
– origin		(0.161)					
Control of corruption			0.338**				
– destination			(0.141)				
Control of corruption			-0.715***				
– origin			(0.116)				
Regulatory quality				0.395***			
– destination				(0.148)			
Regulatory quality				-1.111***			
– origin				(0.137)			
Rule of law – destination					-0.404***		
					(0.157)		
Rule of law – origin					-0.805***		
					(0.170)		
Political stability						-0.0454	
– destination						(0.0996)	
Political stability						-0.540***	
– origin						(0.0787)	
Voice and accountability							-0.521***
– destination							(0.182)
Voice and accountability							-0.232**
– origin							(0.115)
Constant	7.204***	4.894***	7.230***	6.112***	4.111***	7.229***	6.554***
	(1.505)	(1.550)	(1.481)	(1.553)	(1.587)	(1.441)	(1.527)
Observations	120,447	116,423	116,423	116,745	119,585	117,880	119,585
R^2	0.603	0.613	0.602	0.609	0.601	0.601	0.604

All models include destination and origin fixed effects.

Robust standard errors in parentheses. Levels of significance: *** p<0.01, ** p<0.05, * p<0.1.

Table 3. The effect of institutions on migration flows (spatial specification)

	Full sample						Non-OECD countries					
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Government effectiveness	0.224						0.653***					
– destination	(0.163)						(0.210)					
Government effectiveness	-0.964***						-0.964***					
– origin	(0.144)						(0.223)					
Control of corruption		0.263**						0.449***				
– destination		(0.124)						(0.155)				
Control of corruption		-0.546***						-0.460***				
– origin		(0.112)						(0.176)				
Regulatory quality			0.247						0.331			
– destination			(0.158)						(0.206)			
Regulatory quality			-0.855***						-0.873***			
– origin			(0.129)						(0.227)			
Rule of law – destination				-0.339**						-0.0172		
				(0.157)						(0.197)		
Rule of law – origin				-0.564***						-0.707***		
				(0.149)						(0.258)		
Political stability					0.0202						0.256*	
– destination					(0.108)						(0.137)	
Political stability					-0.459***						-0.485***	
– origin					(0.0684)						(0.0970)	
Voice and accountability						-0.365**						-0.407*
– destination						(0.184)						(0.213)
Voice and accountability						-0.152						-0.0772
– origin						(0.108)						(0.160)
Specific source contagion	0.0133***	0.0132***	0.0130***	0.0131***	0.0132***	0.0133***	0.0129***	0.0131***	0.0129***	0.0129***	0.0130***	0.0132***
	(0.00156)	(0.00153)	(0.00155)	(0.00153)	(0.00155)	(0.00154)	(0.00176)	(0.00170)	(0.00176)	(0.00175)	(0.00175)	(0.00174)
Specific target contagion	0.0081***	0.0082***	0.0081***	0.0084***	0.0084***	0.0085***	0.0057***	0.0059***	0.0056***	0.0058***	0.0059***	0.0060***
	(0.00148)	(0.00146)	(0.00152)	(0.00151)	(0.00150)	(0.00155)	(0.00143)	(0.00143)	(0.00147)	(0.00143)	(0.00142)	(0.00147)
Constant	2.977**	4.899***	4.015***	2.672*	4.925***	4.473***	8.601***	9.997***	8.236***	7.770***	9.551***	9.119***
	(1.423)	(1.365)	(1.469)	(1.489)	(1.309)	(1.417)	(1.940)	(1.780)	(1.924)	(2.026)	(1.764)	(1.815)
Observations	116,423	116,423	116,745	119,585	117,880	119,585	77,983	77,983	78,243	80,556	79,161	80,556
R^2	0.603	0.592	0.591	0.597	0.598	0.593	0.500	0.489	0.490	0.495	0.494	0.482

All models include controls for contiguity, common language, common colonial past, and common legal origin, as well as destination and origin fixed effects (not shown).

Robust standard errors in parentheses. Levels of significance: *** p<0.01, ** p<0.05, * p<0.1

Table 4. The effect of poverty and institutions on migration flows (spatial specification)

	Full sample						Non-OECD					
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Poverty – origin	-1.567***	-1.446***	-1.280***	-1.420***	-1.500***	-1.558***	-0.997*	-1.002*	-0.679	-0.907	-1.051**	-1.159**
	(0.382)	(0.380)	(0.409)	(0.399)	(0.357)	(0.384)	(0.550)	(0.540)	(0.590)	(0.582)	(0.517)	(0.557)
Government effectiveness	0.0632						0.450**					
– destination	(0.160)						(0.217)					
Government effectiveness	-0.820***						-0.415					
– origin	(0.179)						(0.269)					
Control of corruption		0.246**						0.389**				
– destination		(0.124)						(0.156)				
Control of corruption		-0.481***						-0.299				
– origin		(0.129)						(0.199)				
Regulatory quality			0.179						0.323			
– destination			(0.162)						(0.221)			
Regulatory quality			-0.562***						-0.557**			
– origin			(0.132)						(0.226)			
Rule of law – destination				-0.293*						0.261		
				(0.168)						(0.218)		
Rule of law – origin				-0.367**						-0.378		
				(0.169)						(0.298)		
Political stability					0.0119						0.284*	
– destination					(0.119)						(0.148)	
Political stability					-0.391***						-0.367***	
– origin					(0.0757)						(0.105)	
Voice and accountability						0.00993						0.146
– destination						(0.180)						(0.230)
Voice and accountability						-0.167						-0.171
– origin						(0.125)						(0.187)
Specific source contagion	0.0135***	0.0135***	0.0135***	0.0136***	0.0137***	0.0139***	0.0176***	0.0169***	0.0171***	0.0173***	0.0173***	0.0172***
	(0.00248)	(0.00244)	(0.00246)	(0.00245)	(0.00242)	(0.00245)	(0.00308)	(0.00311)	(0.00301)	(0.00310)	(0.00311)	(0.00298)
Specific target contagion	0.0096***	0.0095***	0.0097***	0.0098***	0.0098***	0.0099***	0.0055***	0.0052***	0.0052***	0.0053***	0.0053***	0.0051***
	(0.00139)	(0.00141)	(0.00142)	(0.00143)	(0.00139)	(0.00143)	(0.00140)	(0.00143)	(0.00141)	(0.00143)	(0.00143)	(0.00144)
Constant	2.662	4.210**	3.928**	2.510	4.895***	4.119**	7.851***	8.487***	7.452***	7.643***	8.775***	7.958***
	(1.770)	(1.750)	(1.803)	(1.864)	(1.622)	(1.812)	(2.746)	(2.766)	(2.836)	(2.918)	(2.493)	(2.794)
Observations	76,979	76,979	77,083	78,327	77,493	78,327	45,7	45,7	45,773	46,676	46,059	46,676
R^2	0.693	0.679	0.676	0.684	0.687	0.680	0.660	0.660	0.654	0.659	0.670	0.658

All models include controls for contiguity, common language, common colonial past, and common legal origin, as well as destination and origin fixed effects (not shown).

Robust standard errors in parentheses. Levels of significance: *** p<0.01, ** p<0.05, * p<0.1

Appendix

Table A1. Definitions and main sources of the Worldwide Governance Indicators

Indicator	Meaning	Most representative sources
Government effectiveness	Quality of the civil service and of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies	– Economist Intelligence Unit – World Economic Forum Global Competitiveness Report – Gallup World Poll – Institutional Profiles Database – International Country Risk Guide – Global Insight Business Conditions and Risk Indicators – Afrobarometer
Control of corruption	The extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests	– Economist Intelligence Unit – Freedom House – World Economic Forum Global Competitiveness Report – Gallup World Poll – Institutional Profiles Database – International Country Risk Guide – Global Insight Business Conditions and Risk Indicators – Afrobarometer
Regulatory quality	The ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development	– Economist Intelligence Unit – World Economic Forum Global Competitiveness Report – Institutional Profiles Database – International Country Risk Guide – Global Insight Business Conditions and Risk Indicators
Voice and accountability	The extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media	– Economist Intelligence Unit – Freedom House – World Economic Forum Global Competitiveness Report – Gallup World Poll – Institutional Profiles Database – International Country Risk Guide – Reporters Without Borders – Global Insight Business Conditions and Risk Indicators – Afrobarometer
Rule of law	The extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence	– Economist Intelligence Unit – World Economic Forum Global Competitiveness Report – Gallup World Poll – Institutional Profiles Database – International Country Risk Guide – US State Department – Global Insight Business Conditions and Risk Indicators – Afrobarometer
Political stability and absence of violence	The likelihood that the government will be destabilized by unconstitutional or violent means, including politically-motivated violence and terrorism	– Economist Intelligence Unit – World Economic Forum Global Competitiveness Report – Institutional Profiles Database – International Country Risk Guide – Global Insight Business Conditions and Risk Indicators

Source: Kaufmann et al. (2010)

Table A2. The effect of institutions on migration flows (non-OECD countries, non-spatial specification)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
GDP p.c. – destination	-0.786**	-1.001***	-0.850***	-1.064***	-0.822**	-0.925***	-0.691*
	(0.381)	(0.334)	(0.326)	(0.394)	(0.365)	(0.339)	(0.373)
GDP p.c. – origin	-0.00435	0.337	-0.0706	0.390	0.245	0.0960	-0.152
	(0.377)	(0.342)	(0.319)	(0.372)	(0.367)	(0.335)	(0.354)
Distance	-1.208***	-1.215***	-1.210***	-1.212***	-1.206***	-1.208***	-1.205***
	(0.0640)	(0.0637)	(0.0641)	(0.0635)	(0.0633)	(0.0641)	(0.0642)
Contiguity	2.287***	2.264***	2.265***	2.260***	2.293***	2.289***	2.293***
	(0.174)	(0.174)	(0.173)	(0.172)	(0.175)	(0.174)	(0.175)
Common language	0.580***	0.576***	0.583***	0.592***	0.570***	0.575***	0.575***
	(0.162)	(0.163)	(0.162)	(0.160)	(0.164)	(0.162)	(0.162)
Common colonial past	0.551**	0.536**	0.549**	0.559**	0.560**	0.548**	0.553**
	(0.220)	(0.219)	(0.221)	(0.219)	(0.220)	(0.221)	(0.220)
Common legal origin	0.186	0.187	0.190	0.180	0.181	0.179	0.184
	(0.151)	(0.150)	(0.151)	(0.151)	(0.152)	(0.151)	(0.151)
Government effectiveness		0.889***					
– destination		(0.219)					
Government effectiveness		-1.271***					
– origin		(0.253)					
Control of corruption			0.504***				
– destination			(0.174)				
Control of corruption			-0.724***				
– origin			(0.176)				
Regulatory quality				0.435**			
– destination				(0.211)			
Regulatory quality				-1.226***			
– origin				(0.243)			
Rule of law – destination					-0.0290		
					(0.201)		
Rule of law – origin					-1.143***		
					(0.267)		
Political stability						0.178	
– destination						(0.148)	
Political stability						-0.624***	
– origin						(0.105)	
Voice and accountability							-0.590***
– destination							(0.218)
Voice and accountability							-0.218
– origin							(0.170)
Constant	12.00***	10.86***	12.62***	9.880***	8.912***	11.76***	11.28***
	(1.915)	(2.095)	(1.887)	(2.076)	(2.209)	(1.905)	(1.911)
Observations	81,263	77,983	77,983	78,243	80,556	79,161	80,556
R^2	0.449	0.475	0.464	0.467	0.473	0.465	0.454

All models include destination and origin fixed effects.

Robust standard errors in parentheses. Levels of significance: *** p<0.01, ** p<0.05, * p<0.1.