ISSN 2785-7727

Erasmus Mundus Joint Master Degree

Economics of Globalisation and European Integration

Economics of Global Interactions
EGEI - Working Paper 2-2022

How Foreign Aid Affects Migration: Quantifying Transmission Channels

Léa Marchal
University of Paris 1 Pantheon-Sorbonne, France.
E-mail: lea.marchal@univ-paris1.fr

Claire Naiditch
University of Lille, France.
E-mail: claire.naiditch@univ-lille.fr

Betül Simsek
Institute of Law and Economics - Hamburg University, Germany.
E-Mail: betuel.simsek@uni-hamburg.de

Suggested Citation: Marchal, L., Naiditch, C. and Simsek, B. (2022) : How Foreign Aid Affects Migration: Quantifying Transmission Channels, EGEI WP Series, 2/2022 https://www.master-egei.eu/egei-working-paper-series/

How Foreign Aid Affects Migration: Quantifying Transmission Channels

Léa MARCHAL†, Claire NAIDITCH‡, and Betül SIMSEK◇

†Corresponding author. University of Paris 1 Pantheon-Sorbonne - CES (8174), lea.marchal@univ-paris1.fr, MSE, 106-112 Boulevard de l'Hôpital, 75647 Paris Cedex 13, France.
‡Univ. Lille, CNRS, IESEG School of Management, UMR 9221 - LEM - Lille Économie Management, F-59000 Lille, France, claire.naiditch@univ-lille.fr
◇Institute of Law and Economics - Hamburg University, Germany, betuel.simsek@uni-hamburg.de

November 10, 2022

Abstract

This is the first global study that quantifies the transmission channels through which foreign aid impacts migration to donor countries. We estimate a gravity model derived from a RUM model, using OECD data between 2011 and 2019 and an instrumentation strategy. Our identification takes advantage of data on multilateral aid provided by multilateral agencies which is non-donor specific. We find evidence that aid donated by a country increases migration to that country through an information channel. If that channel were the only one at play, a 1% increase in bilateral aid would induce a 0.17% increase in migration. In addition, a 1% increase in multilateral aid reduces migration from the less poor origin countries by 0.05% via a development channel.

Key words - Aid, Gravity, Migration
JEL classification - F22, F35, O15

Acknowledgements

We thank Michel Beine, Nicolas Debarsy, Manon Garrouste, Rémi Généroso, Robert Gold, Jerg Gutmann, Silvia Migali, Clément Nedoncelle, Filippo Santi and Stefan Voigt for their constructive remarks. We also thank participants at the 1st HSU-IfW-Workshop in Development and Environmental Economics, the 2019 ETSG, the 2019 Aarhus-Kiel workshop, the 2020 Understanding Voluntary and Forced Migration conference, the 2020 ifo CEMIR Junior Economist Workshop on Migration Research, the LEM economic seminar and the 10th annual conference on Immigration in OECD countries. The usual disclaimer applies. Declarations of interest: none.

1 Introduction

The increased immigration pressure faced by developed countries has urged policy-makers to find ways to contain migration, especially from developing countries. Among several policy tools, foreign aid is seen as a way to promote living standards in developing countries and therefore to reduce incentives of individuals to emigrate. This development-friendly policy is often presented as more effective than physical and bureaucratic barriers to entry that often raise humanitarian concerns. For instance, in 2015, the European Commission presented a European Agenda on Migration to provide means of managing irregular as well as legal migration. Two of its objectives are related to foreign aid: addressing "the root causes [of migration] through development cooperation and humanitarian assistance" and implementing "stronger action to link migration and development policy." Yet, the efficiency of such policies is unclear and there is no consensus in the literature regarding the impact of foreign aid on migration flows (see Clemens and Postel, 2018, for a review of the literature).

Four transmission channels have been highlighted in the literature so far (among others, see Angelucci 2015; Berthélemy, Beuran and Maurel 2009; Dreher, Fuchs and Langlotz 2019; Lanati and Thiele 2018*b*). First, aid reduces migration flows through a *development channel* by increasing disposable income in the origin country. Second, aid fosters migration through a *credit constraint channel* by providing individuals who wish to emigrate with the financial means to do so. Third, bilateral aid increases migration through an *information channel* by giving the population of the recipient country information on the donor country that in turn decreases the costs of migration to that particular country. Finally, the effect of aid also takes place through an *instrumentation channel* when the donor country uses bilateral aid strategically to push the recipient country into tightening its emigration policy. The first two channels are non-donor-specific while the last two ones are donor-specific since they point to a relationship between bilateral aid and the reverse bilateral migration flow. Existing empirical evidence is rather mixed. The question of whether foreign aid effectively decreases migration and especially through which channels remains unclear. This article intends to address that issue.

In this article, we propose a strategy to identify the impact of foreign aid on migration with a special focus on the transmission channels at play, distinguishing between donor-specific and non-donor-specific effects. First, we build a random utility maximisation (RUM) model of migration allowing us to derive a gravity model from the aggregation of individuals' probability to migrate. Although the RUM model has previously been employed in similar settings (e.g. Beine and Parsons, 2015), our model is the first one to consider the impact of multilateral aid. This allows us to clearly identify the channels through which different types of aid may impact migration.

We then rely on this gravity framework to estimate the causal impact of foreign aid on migration rates. To this end, we use OECD data from 2011 to 2019 and estimate the impact of foreign aid from a donor to a recipient country on the reverse bilateral migration rate, as well as the impacts of remaining bilateral and multilateral aid received by the country. To infer causality, we use an IV-2SLS strategy, with an instrument for bilateral aid from a donor country to a recipient country that consists in re-weighting total aid given by the donor at one period by the initial share of the recipient in the donor's initial aid budget. We then use our estimates to identify the channels through which aid can affect migration. Our identification strategy relies on the introduction of multilateral aid in the gravity model and on two features of this particular type of foreign aid. First, the effect of multilateral aid can *only* be associated with a non-donor-specific effect because the identity of the donor countries is unknown when aid is conveyed through a multilateral agency.[1] Second, we assume that bilateral and multilateral aid flows have the same marginal impact on living standards in receiving countries.

We find evidence that bilateral aid has a positive impact on the reverse migration rate. The effect of bilateral aid is mostly conveyed through an information channel. If that channel were the only one at play, then a 1% increase in bilateral aid would induce a 0.17% increase in the reverse bilateral migration rate. We also find that multilateral aid has a significant negative impact via a development channel, especially for the less poor countries. In these countries, a 1% increase in multilateral aid induces a 0.05% decrease in the bilateral migration rate. Finally, we do not find any evidence for the credit constraint channel nor the instrumentation channel to prevail respectively over the development or the information channels. The results are robust to alternative instruments and specifications.

To the best of our knowledge, this is the first study to quantify the donor-specific and non-donor-specific transmission channels through which foreign aid affects migration.[2] We disentangle the channels that were previously misidentified in the literature and open the door to a research consensus on the global impact of foreign aid on migration. The article most closely related to ours is a study by Lanati and Thiele (2018*b*). In this work, the authors revisit the aid-migration nexus using an econometric approach based on a gravity model of international migration. Although our article follows the same gravity-based approach, it differs from this study by introducing in the model multilateral aid and the aid given by all the other donor countries (instead of the total aid received). This specification thus corrects for an omitted variable bias, and allows us to disentangle non-donor- and donor-specific effects of foreign aid.

2 A RUM Model of Migration with Foreign Aid

We derive our theoretical insights from a random utility maximisation (RUM) model of migration (Beine, Docquier and Özden, 2011). We incorporate foreign aid in this model

[1] To be precise, we only consider contributions to the regular budget of the multilateral agency, where individual countries have no leeway in the distribution of their contributions.

[2] Lanati and Thiele (2018*a*) intend to distinguish between the development and the credit constraint channels incorporating late- and early-impact aid in the model.

in order to highlight through which channels aid impacts migration decisions. This model allows us to derive a gravity model that we estimate to quantify each transmission channel.

The model. We consider the migration decision of an individual i. At time t, she faces a choice among D destinations (including her own country o). To each possible destination corresponds a different level of utility, depending on the characteristics of the individual, the origin and the destination countries. Let $U_{iod,t}$ denote the utility that individual i living in country o obtains from choosing to migrate to country d at time t. The individual chooses the destination d that maximises her utility such that $U_{iod,t} = \max_{l\in\{1,\ldots,D\}} U_{iol,t}$. Following Beine, Bertoli and Fernández-Huertas Moraga (2015), we assume that she makes myopic decisions, deciding whether to migrate or not and where to at each period of her lifetime.

Individual i's utility can be decomposed into a term $W_{od,t}$ representing a deterministic component of the utility in country d (for instance the expected wealth), and an individual-specific stochastic term $\varepsilon_{iod,t}$. To migrate from country o to country d at time t, the individual incurs a deterministic cost of migration denoted $C_{od,t}$ (with $C_{oo,t} = 0$). Then, her utility of migrating from country o to country d at time t can be written:

$$U_{iod,t} = W_{od,t} - C_{od,t} + \varepsilon_{iod,t}. \tag{1}$$

As standard in the literature, we assume that $\varepsilon_{iod,t}$ is independent and identically distributed over individuals, destinations and time, and follows a univariate Extreme Value Type-1 distribution with a unit scale parameter.

The bilateral migration rate at time t, denoted $\text{Mig}_{od,t}$, is given by the ratio of the unconditional probability that an individual relocates from country o to destination d at time t and the unconditional probability that an individual remains in country o at time t. Following the results of McFadden (1974, 1984), it can be written as:

$$\ln \text{Mig}_{od,t} = W_{od,t} - W_{oo,t} - C_{od,t}. \tag{2}$$

The bilateral migration rate depends only on the characteristics of the origin and destination countries and on the bilateral migration cost. This is representative of the property of Independence of Irrelevant Alternatives (IIA), according to which a variation in the attractiveness or the accessibility of an alternative destination does not impact the bilateral migration rate (Beine, Bertoli and Fernández-Huertas Moraga, 2015).

According to equation (2), any variable impacting utilities and migration costs, such as foreign aid received by country o, indirectly impacts migration rates. The main derivations showing the link between foreign aid and migration rates for the different channels are presented in appendix A.

Theoretical insights. We consider three types of foreign aid received by country o: multilateral aid, bilateral aid donated by country d, and bilateral aid donated by all donor countries but d. Depending on the prevailing channel, multilateral and bilateral aid flows have a different impact on migration rates. The results are summarised in Table 1.

First, in the case of multilateral aid flows, donor countries are unknown to the recipient country and have no direct control over the way the funds are used. Thus, the only active channels are the non-donor-specific ones. The impact of multilateral aid on migration to *any country* will be negative if the development channel prevails, and positive if the credit constraint channel prevails.

Second, bilateral aid affects migration flows through non-donor-specific *and* donor-specific channels. Concerning the non-donor-specific effects, migration to country d should decrease with bilateral aid from *any* donor if the development channel prevails, and increase if the credit constraint channel prevails. Concerning the donor-specific channels, migration *to the donor country* should increase with bilateral aid *from the donor country* if the information channel prevails, and decrease if the instrumentation channel prevails.

Third, because of the IIA property, bilateral aid received by country o from all donors but d does not impact bilateral migration from country o to country d through channels specific to donor d.

Table 1: The Theoretical Impact of Foreign Aid on the Migration Rate to Country d

Non-donor-specific channels		**Donor-d-specific channels**	
Development	Credit constraint	Information	Instrumentation
Impact of multilateral aid			
$\leqslant 0$	$\geqslant 0$	0	0
Impact of bilateral aid from d			
$\leqslant 0$	$\geqslant 0$	$\geqslant 0$	$\leqslant 0$
Impact of bilateral aid from all other donors			
$\leqslant 0$	$\geqslant 0$	0	0

Empirical evidence. Related empirical studies are listed in appendix, Table A.1. Several articles find supportive evidence for the development channel hypothesis. Lanati and Thiele (2018*a*,*b*, 2020*a*,*b*) point out that an increase in total aid improves the quality of public services in the recipient country which in turn leads to a decrease in emigration rates from that country. This negative relationship is also put forward by Gamso and Yuldashev (2018*a*,*b*) and Moullan (2013). In addition, Dreher, Fuchs and Langlotz (2019) and Murat (2020) show that foreign aid decreases refugee flows and asylum applications.

A number of studies point to a positive relationship between aid and migration flows, suggesting that development aid may alleviate credit constraints. Angelucci (2015) and Howell (2022) show that antipoverty conditional cash transfer programmes increase migration, because these cash transfers relax financial constraints. Berthélemy, Beuran and Maurel (2009) find this channel especially at play for the unskilled, whereas Ontiveros and Verardi (2012) show that this happens to be the case for the skilled. This negative relationship is also put forward by Lanati and Thiele (2018*b*); Mughanda (2011); Murat (2020).

There is only limited evidence on the information effect of bilateral aid flows on the reverse migration flows or stocks. Berthélemy, Beuran and Maurel (2009) as well as Ontiveros and Verardi (2012) find support for this transmission channel, especially in the case of skilled migrants. Lanati and Thiele (2018*b*) and Menard and Gary (2020) confirm this impact. Dreher, Fuchs and Langlotz (2019) suggest that the image of destination countries should matter for the emigration decisions of refugees.

Finally, two studies test the hypothesis that a donor country could use bilateral aid strategically in order to influence the emigration policy of the recipient country. Azam and Berlinschi (2009) argue that foreign aid is probably an effective tool for reducing the inflow of migrants into developed countries. Focusing on refugees, Dreher, Fuchs and Langlotz (2019) find that aid has a positive impact on the repatriation policies of refugees from the donor to the receiving countries.

3 Empirical Strategy

3.1 Data and Descriptive Statistics

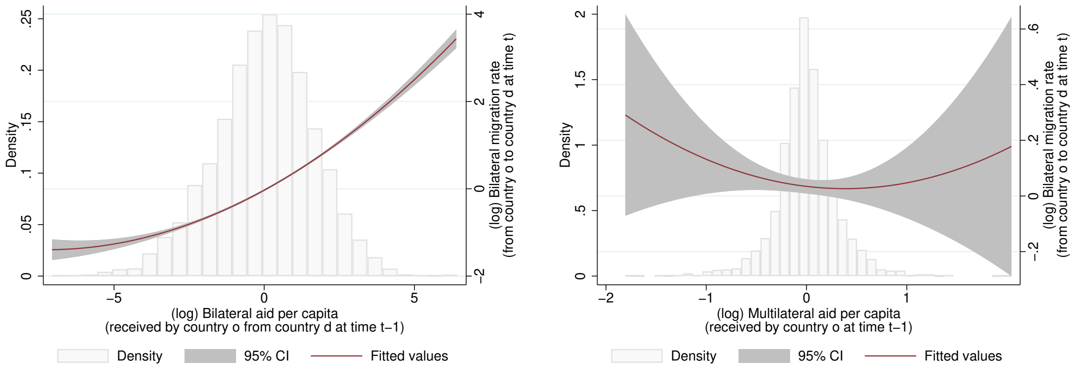
The data. We use the International Migration Database from the OECD (OECD, 2020*b*). This dataset contains bilateral migration flows for 37 destination countries from 1975 to 2019. Destination countries include most OECD countries and some non-OECD countries. We use the *total immigrant population* variable. The OECD database contains data as reported by national statistical offices. For most countries (but not all), the data excludes irregular migrants as well as refugees.

We use data on foreign aid from the OECD-DAC Creditor Reporting System Aid Activity database (OECD, 2020*a*). This dataset is the most comprehensive information source to date tracking international financial aid flows. It contains commitment and disbursement information for all DAC members until 2019. Multilateral aid flows are reported only from 2011 onward.

Other dyadic variables of interest are taken from the GeoDist database developed by the CEPII which contains variables related to the geographical, cultural and linguistic distances between countries (Mayer and Zignago, 2011). The Gravity database from CEPII provides other dyadic variables as well as countries' GDP per capita to perform gravity-type analyses (Head, Mayer and Ries, 2010). We also use aggregate data from the World Bank, population data from the World Development Indicators and bilateral migration stocks from the Global Bilateral Migration database. After cleaning and merging these datasets, we obtain a sample covering 30 destination countries and 129 origin countries over the period 2011-2019. We report a number of summary statistics in appendix, Table A.2 and A.3.

Descriptive statistics. Our variable of interest is the bilateral migration rate between an origin country and a destination country. As standard in the literature, this rate is proxied by the ratio of the bilateral migration flow observed between the two countries to the population of the origin country. We depict the statistical relationship between foreign aid per capita and migration flows in Figure 1. We find a positive correlation between bilateral migration rates and bilateral aid per capita that could indicate the prevalence of a credit constraint or an information channel. We find a slight negative correlation between bilateral migration rates and multilateral aid per capita that could indicate the prevalence of a development channel. These correlations are informative, but do not reflect causal relationships. They do suggest that different channels may be at play simultaneously. The reminder of the article aims at shading light on these transmission channels.

Figure 1: Bilateral Migration Rates and Foreign Aid per Capita



Statistical relationships between bilateral migration rates and foreign aid per capita. The graph on the left shows a quadratic fit of the (log) amount of bilateral aid per capita received by country o from country d against the (log) bilateral rate of migration from country o to country d (excluding zeros). The graph on the right shows a quadratic fit of the (log) amount of multilateral aid per capita received by country o against the (log) bilateral rate of migration from country o to country d (excluding zeros). Aid per capita is measured in the same way as people migrating (the ratio of aid over the population in the origin country). Country and time fixed effects have been partialled out. The graphs also report the distribution of observations used to compute this fit.

3.2 Identification of the Impact of Foreign Aid

Following existing literature and our theoretical model, equation (2) can be estimated as follows:

$$\begin{aligned}\ln \text{Mig}_{od,t} = &\beta_0 + \beta_1 \ln \text{Aid}_{do,t-1} + \beta_2 \ln \text{Aid}_{\Lambda o,t-1} + \beta_3 \ln \text{MultiAid}_{o,t-1} \\ &+ B'\Gamma + \gamma_o + \gamma_{dt} + \epsilon_{od,t}\end{aligned} \tag{3}$$

where the dependent variable is the logarithm of the bilateral migration rate from country o to country d at time t. The independent variables of interest include the flow of bilateral aid donated by country d to country o, denoted $\text{Aid}_{do,t-1}$, the flow of bilateral aid donated by other countries than d to country o, denoted $\text{Aid}_{\Lambda o,t-1}$, and the total amount of multilateral aid donated to country o, denoted $\text{MultiAid}_{o,t-1}$. The impact of aid flows on migration decisions are probably not instantaneous so it seems sensible to assume that migration rates at time t are determined by the amount of foreign aid received at time $t-1$.

Γ includes the (log) distance in kilometres between the capital cities of countries o and d, a dummy variable equal to one if the two countries share a common official language and zero otherwise, and a dummy variable equal to one if the two countries share a common border and zero otherwise. Γ also includes the (log) bilateral stock of migrants in the previous decade and the (log) ratio of GDP per capita of the origin country over the GDP per capita of the destination country at time $t-1$.

As standard in the literature, we include origin and destination-year fixed effects (FE) denoted γ_o and γ_{dt} respectively. Origin fixed effects capture time-invariant characteristics of the origin countries. Destination-year fixed effects control, as much as possible, for multilateral resistance to migration (e.g. Beine, Docquier and Özden, 2011; Beine and Parsons, 2015, 2017). In addition, these FE control for migration policies at destination, which - if not controlled for - can severely bias the estimations (Ortega and Peri, 2013; Mayda, 2010). We follow the literature by clustering standard errors within the origin-year dimension.

The main source of endogeneity that could bias the estimation of equation (3) is due to a reverse causality bias running from bilateral migration to bilateral aid. For instance, the lobbying of migrants from one origin country in their host country may lead to an increase in the reverse bilateral aid (Lahiri and Raimondos-Møller, 2000; Bermeo and Leblang, 2015). Similarly, a long tradition of emigration from one country to another may strengthen the relationship between the two countries and thus lead to important reverse development aid (Bermeo and Leblang, 2015). Besides, some countries donate aid based on altruism while others attribute aid based on economic and political concerns (Berthélemy, 2006; Annen and Knack, 2020). Yet, these concerns may be correlated with migrants' decisions and therefore induce a simultaneity bias in the results. Another endogeneity threat comes from potential omitted variables that could determine migration decisions and be correlated with bilateral aid. These endogeneity issues come from the link between bilateral migration rates and bilateral aid flows. This is why we instrument the bilateral aid variable but not the rest of bilateral aid nor multilateral aid received by country o.

To obtain causal results, we rely on an instrumental variable (IV) strategy. To instrument bilateral aid, we use the initial share of aid sent to country o by a donor country multiplied by the donor country's actual total bilateral aid:

$$\text{IV}_{do,t} = \frac{\text{Aid}_{do,t_0}}{\text{Aid}_{d,t_0}} \text{Aid}_{d,t} \;\; \forall t > t_0 \tag{4}$$

where t_0 denotes the first year a country pair enters the sample and $\text{Aid}_{d,t}$ denotes total (bilateral) aid attributed by a donor country d at time t. This instrument was first proposed by Temple and Van de Sijpe (2017) and has gained strong support from the aid allocation literature (among others, see Dreher et al., 2021; Carter, de Sijpe and Calel, 2021).

This instrument exploits changes in total donor budgets, weighted by the initial shares of recipients in those budgets. It should isolate changes in aid receipts that are not driven by the conditions of individual aid recipients. It is presumably exogenous as the initial share of aid allocated to a recipient country should not be correlated with the actual recipient countries' emigration rates to the donor country. Doing so, we assume that, although the absolute amount of aid donated over the world by a donor country d may vary over time, the distribution of aid from this donor across recipient countries remains constant. We thus control for changes in the demand for aid as well as in the supply of aid that could be caused by migrants. For instance, our instrumental variable is cleaned from variations that could be induced by the stronger lobbying of migrants from country o living in country d than of migrants from country o' living in country d ($\forall o' \neq o$) (since a stronger lobbying could result in a change in the distribution of aid across donor-recipient pairs).

3.3 Identification of the Transmission Channels

Equation (3) allows us to quantify the transmission channels through which foreign aid may impact bilateral migration. Our strategy consists in distinguishing the impact of aid that *is not* specific to the donor countries (development and credit constraint channels) from the impact that *is* donor-specific (information and instrumentation channels).

The non-donor-specific impact of aid. To test if the development or the credit constraint channels are at play and which of these two channels prevails, we study the impact of multilateral aid flows received by country o on the migration rate from country o to country d. The sign and significance of β_3 should indicate which of the two non-donor-specific and conflicting channel prevails, whether both channels are simultaneously at play or not. A negative sign would indicate that aid decreases migration through its prevailing impact on development. On the contrary, a positive sign would provide evidence that aid increases migration rates because of its prevailing effect on individuals' credit constraints.

The donor-specific impact of aid. To quantify the donor-specific impact of aid, we use both coefficients β_1 and β_3. β_1 indicates by how much the migration rate from country o to country d is affected by the flow of aid donated by country d to country o. This coefficient potentially encompasses non-donor-specific *and* donor-specific effects.

To isolate the impact of aid channelled via donor-specific effects, we study the impact of an increase in bilateral aid from country d to country o holding constant the full aid received by country o (defined by the sum of bilateral and multilateral aid flows received by country o) as well as the distribution of aid across other donor countries. In that case, the non-donor-specific channels do not change (since the full aid received by country o is constant), and the donor-specific channels that vary are only those related to the donor country d. At time t, if bilateral aid increases by x percent while multilateral aid decreases by y percent, with $y = x * (\text{Aid}_{do,t-1}/\text{MultiAid}_{o,t-1})$, then the full aid received by country o remains constant, as well as the distribution of aid across other donor countries. If $\text{Aid}_{do,t-1}$ increases by 1 percent and $\text{MultiAid}_{o,t-1}$ decreases by $\text{Aid}_{do,t-1}/\text{MultiAid}_{o,t-1}$ percent, then the migration rate changes by $[\beta_1 - \beta_3(\text{Aid}_{do,t-1}/\text{MultiAid}_{o,t-1})]$ percent. To obtain an average coefficient, we average observations and bootstrap the statistics to obtain the standard errors. This coefficient is related to effects specific to donor d; its sign and significance show which of the information or the instrumentation channel prevails (whether both channels are simultaneously at play or not).

Similarly, to measure the magnitude of the effects specific to all donors but d, we study the sign and significance of $[\beta_2 - \beta_3(\text{Aid}_{\Lambda o,t-1}/\text{MultiAid}_{o,t-1})]$, which captures the change in the proportion of individuals who would migrate to country d due to a change in the distribution of aid across other donor countries than d (keeping the full aid received constant). In doing so, we test the presence of multilateral resistance to migration, since we look at how migration to country d varies with a change in aid received from alternative destinations.

Discussion. The identification strategy relies on two premises. We consider that multilateral aid is *cleaned* from donor-specific effects as it emanates from third-party agencies. It only includes contributions from agencies' regular budget to aid recipient countries and excludes earmarked contributions. First, the recipient country has presumably no knowledge of the origin of this aid. One could argue that the donor countries can still be identified by the recipient country; yet the fact that the aid flow comes from the regular budget of the agency that pulls contributions from several donors should blur its donor-specific content. Second, individual donor countries have presumably no control over the way the agency uses its regular budget. Finally, to confirm our premise, we estimate the (log) bilateral migration rate on origin-year, destination-year and dyadic fixed effects. We then retrieve the destination-year variation (in other words the donor-year variation) and plot it against multilateral and bilateral aid flows. These descriptive facts are presented in appendix Figure A.1, and show that changes in migration rates that are attributable to destination-year variations are poorly correlated with multilateral aid flows (while they are positively correlated with bilateral aid flows). The weak correlation hence suggests that the recipient country has little information on the origin of multilateral aid.

Then, the identification strategy of the transmission channels relies on the fact that one dollar of aid contribution by a multilateral agency has the same non-donor-specific impact as one dollar of aid contribution from an individual donor, which implies that both types of aid have the same impact on living standards in receiving countries. Yet, this may not be the case. For instance, multilateral aid is frequently characterised as being relatively more focused on supporting development outcomes in developing countries, while bilateral aid is seen as more likely to be allocated based on donor strategic interests (Alesina and Dollar, 2000; Burnside and Dollar, 2000; Milner and Tingley, 2013; Schraeder, Hook and Taylor, 1998). Nevertheless, the literature corroborates our assumption. In their review of 45 papers empirically testing the effectiveness of bilateral and multilateral aid flows on various development outcomes, Biscaye, Reynolds and Anderson (2017) study why bilateral and multilateral aid flows may (or may not) have different levels of effectiveness and conclude that there is no consistent evidence on the fact that one aid flow is more effective than the other, which supports the identification strategy.

4 Empirical Results

4.1 Main Findings

Benchmark results. Benchmark results of the IV strategy are reported in Table 2, columns (1) to (4). In columns (1) to (3), we progressively include the variables of interest. The results of our baseline specification are reported in column (3). This regression includes bilateral aid received by country o from country d as well as bilateral aid received by country o from all donors but d. This approach is similar to Murat (2020). In addition, it includes the amount of multilateral aid received by country o. In doing so, we find that a 1% increase in bilateral aid from country d to country o induces a 0.16% increase in the reverse bilateral migration rate. This result is similar to the coefficients reported in columns (1) and (2). The remaining amount of bilateral aid received has a significant and negative impact on the migration rate: a 1% increase in bilateral aid from all donor countries but d to country o induces a 0.06% decrease in the bilateral migration rate from o to d; and the result is similar in column (2). Finally, multilateral aid has a negative and significant impact on the bilateral migration rate. A 1% increase in multilateral aid to country o induces a 0.05% decrease in the bilateral migration rate from o to d. Although not reported, other covariates exhibit the expected sign and level of significance.

In column (4), we reproduce the standard specification used in the literature (Lanati and Thiele, 2018*b*; Berthélemy, Beuran and Maurel, 2009), including the bilateral aid flow from country d to country o as well as the *total* bilateral aid received by country o ($\text{Aid}_{o,t-1}$) as explanatory variables. We find that a 1% increase in the bilateral aid flow induces a 0.16% increase in the reverse bilateral migration rate in the following year. In addition, we find that the effect of the total bilateral aid received by country o is weakly significant and negative. The main caveat of this specification is that bilateral aid between a country d and a country o is included twice in the model. In addition, multilateral aid flows are omitted from this specification.

For each specification, we report the F-stat form of the Kleibergen-Paap statistic that provides a test for weak instruments when errors are clustered. The statistic is above the critical value which confirms that our instrument is a strong enough predictor of the observed bilateral aid flows. In addition, the first stage results show that, for all specifications, the instrumental variable is significantly and positively correlated with the endogenous variable of interest.

The results of OLS regressions show that the estimates related to bilateral aid suffer from a downward bias (Table 2, columns 5 to 8). In theory, the direction of the bias could go in either direction, as our IV strategy corrects for reverse causality as well as for potential omitted variable biases. On the one hand, one can expect that controlling for reverse causality would control for a positive feedback loop between aid and migration. On the other hand, one cannot exclude that the IV strategy also controls for unobserved shocks that could affect simultaneously aid and migration in different ways. For instance, a negative shock in both the origin and the destination countries could increase migration flows between these countries while reducing aid.

Quantification of the transmission channels. We now turn to the estimation of the transmission channels (last panel of Table 2, column 3). We find evidence for the presence of a development channel which is identified by the coefficient associated with multilateral aid (β_3). This result implies that the development channel dominates the credit constraint channel (if the later is at play).

Then, we find a positive and highly significant coefficient associated with the specific effect of donor d. This result indicates that the information channel prevails (over the instrumentation channel, if any). A 1% increase in bilateral aid, keeping full aid received as well as the distribution of aid received from other donors constant, induces a 0.17% increase in the reverse bilateral migration rate. In other words, when a donor country increases its aid to a recipient country and when the amount of multilateral aid received by that country decreases by the same amount, then the bilateral migration rate from the recipient country to that particular donor country increases. This result implies that bilateral aid conveys information decreasing the corresponding bilateral cost of migration, in turn increasing the

Table 2: Benchmark Results

	ln $Mig_{od,t}$							
Regressions	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ln $Aid_{do,t-1}$	0.1592***	0.1580***	0.1582***	0.1591***	0.1391***	0.1382***	0.1386***	0.1394***
	(0.0070)	(0.0070)	(0.0070)	(0.0070)	(0.0063)	(0.0063)	(0.0063)	(0.0063)
ln $Aid_{\Lambda o,t-1}$		-0.0675**	-0.0598**			-0.0788***	-0.0716**	
		(0.0306)	(0.0302)			(0.0299)	(0.0295)	
ln $Multi_{o,t-1}$			-0.0495***				-0.0465***	
			(0.0146)				(0.0143)	
ln $Aid_{o,t-1}$				-0.0571*				-0.0518*
				(0.0311)				(0.0306)
Controls (Γ)	yes	yes	yes	yes	yes	yes	yes	yes
Destination-year FE	yes	yes	yes	yes	yes	yes	yes	yes
Origin FE	yes	yes	yes	yes	yes	yes	yes	yes
Observations	13,430	13,430	13,430	13,430	13,430	13,430	13,430	13,430
Estimator	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS	OLS	OLS	OLS	OLS
1st stage	0.8497***	0.8505***	0.8501***	0.8501***				
	(0.0075)	(0.0077)	(0.0077)	(0.0075)				
K-Paap F Stat.	12,837.726	12,344.992	12,317.02	12,878.32				
R-squared					0.8502	0.8502	0.8503	0.8502
Transmission channels								
Non-donor-specific channel			-0.0495***				-0.0465***	
			(0.0146)				(0.0143)	
Channel specific to donor d			0.1665***				0.1505***	
			$(0.0073)^b$				$(0.0077)^b$	
Channel specific to all donors but d			0.5688**				0.5193*	
			$(0.2687)^b$				$(0.2670)^b$	

IV-2SLS and OLS coefficient estimates with standard errors clustered at the origin-year level in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% level respectively. b indicates that the standard errors have been obtained by non-parametric bootstrap. Γ includes the (log) distance in kilometres between the capital cities of countries o and d, a dummy variable equal to one if the two countries share a common official language and zero otherwise, a dummy variable equal to one if the two countries share a common border and zero otherwise, the (log) bilateral stock of emigrants in the past decade and the (log) ratio of the GDP per capita of the origin and destination countries at time $t-1$.

reverse migration rate. In addition, we find a positive effect associated with the specific effect of other donors, significant at the 5% level.

Heterogeneity across income levels. We then investigate whether the impact of aid on migration may be conditioned by the level of development of the recipient country. Analysing the development conditionality enables us to take into account the fact that individuals located in different origin countries may have a different set of *reachable* destinations because they face different credit constraints (Marchal and Naiditch, 2020). Although heterogeneity in the set of reachable destinations could be controlled for using origin-year fixed effects (Beine, Bertoli and Fernández-Huertas Moraga, 2015), our baseline model does not allow us to include these fixed effects and may therefore suffer from a specification bias. To address this issue, we split our sample of observations into two sub-samples: origin countries with an average GDP per capita below the median and those with an average GDP per capita above the median. This approach is in line with Lanati and Thiele (2018*b*).

Results are reported in Table 3, columns (1) and (2). We find that bilateral aid from country d to country o has a significant and positive impact of similar magnitude on reverse migration for both groups of countries. The rest of aid has no significant impact for both groups of countries. Multilateral aid has no significant impact for the poorest countries (column 1), while it has a negative effect for the less poor countries (column 2), which indicates the prevalence of a development effect only for these countries. Regarding the transmission channels, the non-donor-specific channel prevails and is negative only for the less poor countries (column 2). The information channel specific to the donor country d prevails for both types of countries. The channel specific to all donors but d is positive for the less poor countries (column 2).

4.2 Robustness Tests

We now investigate the validity of our instrumentation strategy and present a number of robustness tests. The main results are summarised in Table 4 and corroborate the baseline findings. Detailed results are presented in appendix.

Alternative instrumental variables. We propose two alternative instrumental variables. First, we instrument $\text{Aid}_{do,t}$ using its spatial lag weighted by bilateral distances between countries, in the spirit of Neumayer and Plümper (2010) and Davies and Klasen (2019). The validity of this instrument derives from the fact that the aid received by the set of countries located in the same geographic area as country o should be correlated to the aid received by country o. Yet, it should be poorly correlated to the emigration rate of country o and to the lobbying capacity of the diaspora of country o in foreign countries. This argument should especially be valid in case of low multilateral resistance to migration.

Table 3: Heterogeneity across Income Levels

	$\ln \text{Mig}_{od,t}$	
Regressions	(1)	(2)
$\ln \text{Aid}_{do,t-1}$	0.1758***	0.1492***
	(0.0116)	(0.0095)
$\ln \text{Aid}_{\Lambda o,t-1}$	-0.0778	-0.0404
	(0.0622)	(0.0312)
$\ln \text{Multi}_{o,t-1}$	-0.0047	-0.0667***
	(0.0277)	(0.0174)
Controls (Γ)	yes	yes
Destination-year FE	yes	yes
Origin FE	yes	yes
Observations	7,275	6,148
Sample	below med.	above med.
Estimator	IV-2SLS	IV-2SLS
1st stage	0.8584***	0.8341***
	(0.0112)	(0.0107)
K-Paap F Stat.	5,866.148	6,045.795
Transmission channels		
Non-donor-specific channel	-0.0047	-0.0667***
	(0.0277)	(0.0174)
Channel specific to donor d	0.1767***	0.1616***
	$(0.0120)^b$	$(0.0094)^b$
Channel specific to all donors but d	-0.0302	1.3293**
	$(0.4351)^b$	$(0.5630)^b$

IV-2SLS coefficient estimates with standard errors clustered at the origin-year level in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% level respectively. b indicates that the standard errors have been obtained by non-parametric bootstrap. The sample used in column (1) includes origin-year observations with an average GDP per capita below the median; and the sample used in column (2) includes origin-year observations with an average GDP per capita above the median. Γ includes the (log) distance in kilometres between the capital cities of countries o and d, a dummy variable equal to one if the two countries share a common official language and zero otherwise, a dummy variable equal to one if the two countries share a common border and zero otherwise, the (log) bilateral stock of emigrants in the past decade and the (log) ratio of the GDP per capita of the origin and destination countries at time $t-1$.

Second, following Gamso and Yuldashev (2018*a*,*b*), we use the second and third central moments of the aid distribution as a set of instruments: $[X - mean(X)]^2$ and $[X - mean(X)]^3$ where X denotes $\ln \text{Aid}_{do,t-1}$. This strategy can be adopted in an IV-2SLS set-up when no exogenous variable is available (Lewbel, 1997). In particular, the second and higher moments of an endogenous variable are unrelated to the error term in the presence of heteroscedasticity. Therefore, they can be used as instrumental variables in a two stage least square estimation.

Results are reported in Table A.4. In both cases, the results corroborate the baseline findings: the coefficients associated with bilateral aid are positive and significant, and the coefficients associated with multilateral aid are negative and significant (at the 5% level in column 1). The coefficient associated to the rest of bilateral aid is negative and highly significant in both columns. The signs and significance of the coefficients associated with the donor-specific impact of aid are in line with the baseline results. Overall, this set of results corroborates the presence of an information channel specific to donor country d and the presence of a development channel.

Alternative specifications. We test the validity of our specification in Table A.5. In column (1), we omit the control variables to test if the stability of the results depends on the set of covariates included in the model. In column (2), we do not include the *dyadic* control variables in order to use origin-destination and year FE. We find that, in both cases, the coefficients associated with bilateral and multilateral aid flows remain in line with our benchmark findings.

Then, we include origin-year FE together with destination-year FE to better control for unobserved time-varying characteristics of the origin country, and for multilateral resistance to migration. In column (3), we group the remaining amount of bilateral aid and the multilateral aid flows (instead of including them separately), while we omit them altogether in column (4). Here again, the coefficient associated with bilateral aid remains positive and significant.

Lastly, we cluster errors within the origin (column 5) and the origin-destination (column 6) dimensions to account for unobserved factors that could be correlated with migration decisions from an origin country and from an origin country to a destination country. We find that clustering errors within these alternative dimensions barely alters the sign and significance of the coefficients of interest.

Commitments *versus* disbursements. Finally, we study the potential threat to identification induced by the use of aid commitment flows (in our benchmark estimations) instead of disbursement flows. The OECD-DAC Creditor Reporting System database contains both commitment and disbursement flows. As defined by the OECD, a commitment is "a firm obligation, expressed in writing and backed by the necessary funds, undertaken by an official donor to provide specified assistance to a recipient country or a multilateral organisation", while disbursements "record the actual international transfer of financial resources, or of goods or services valued at the cost to the donor"; the OECD adds that "it can take several years to disburse a commitment" (see the OECD frequently asked questions webpage). The question of whether using commitments or disbursements in the empirical analysis is thus an important one, especially because there is still some debate among economists (Bulíř and Hamann, 2008; Hudson, 2013; Tierney et al., 2011).

Results are reported in Table A.6. In column (1), we use aid disbursements instrumented using the same method as before. In column (2), we use aid disbursements instrumented using commitments flows with the same method as before. The effect of bilateral aid is positive and significant which is in line with our baseline findings. We however find no significant impact of multilateral aid on the bilateral migration rate.

Table 4: Summary of the Results

Model			Average effects of bilateral aid		Transmission channels		
Specification	Estimator	Table	ln $\text{Aid}_{do,t-1}$	ln $\text{Aid}_{\Lambda o,t-1}$	non-donor (ln $\text{MultiAid}_{o,t-1}$)	specific to donor d	specific to all donors but d
Main findings							
Benchmark specification	IV-2SLS	2 (3)	0.1582***	-0.0598**	-0.0495***	0.1665***	0.5688**
Benchmark specification	OLS	2 (7)	0.1386***	-0.0716**	-0.0465***	0.1505***	0.5193*
Heterogeneity across Income Levels - GDP < median	IV-2SLS	3 (1)	0.1758***	-0.0778	-0.0047	0.1767***	-0.0302
Heterogeneity across Income Levels - GDP > median	IV-2SLS	3 (2)	0.1492***	-0.0404	-0.0667***	0.1616***	1.3293**
Robustness tests							
Alternative IV - Spatial lag of bilateral aid	IV-2SLS	A.4 (1)	0.0765**	-0.1087***	-0.0371**	0.0787	0.3625
Alternative IV - Second & third central moments	IV-2SLS	A.4 (2)	0.0972***	-0.0963***	-0.0403***	0.1081***	0.4148
No controls	IV-2SLS	A.5 (1)	0.3991***	-0.2024***	-0.0750***	0.4118***	0.7499*
Dyadic FE	IV-2SLS	A.5 (2)	0.0957***	-0.0673**	-0.0398***	0.1049***	0.4372***
Pooling non-bilateral aid	IV-2SLS	A.5 (3)	0.1555***				
Bilateral aid only	IV-2SLS	A.5 (4)	0.1597***				
Origin cluster	IV-2SLS	A.5 (5)	0.1582***	-0.0598	-0.0495***	0.1665***	0.5688**
Origin-destination cluster	IV-2SLS	A.5 (6)	0.1582***	-0.0598	-0.0495***	0.1665***	0.5688**
OECD-DAC (disbursements, IV disbursements)	IV-2SLS	A.6 (1)	0.1532***	-0.1216***	0.0067	0.1523***	-0.2159
OECD-DAC (disbursements, IV commitments)	IV-2SLS	A.6 (2)	0.1646***	-0.1181***	0.0063	0.1638***	-0.2058

Coefficient estimates. ***, ** and * denote significance at the 1%, 5% and 10% level respectively.

5 Conclusions

This article revisited the aid-migration nexus, intending to quantify the transmission channels. We found strong evidence that bilateral aid has a positive effect on the reverse migration rate, while multilateral aid has a negative impact on average. The effect of aid on migration is conveyed through a positive donor-specific effect: the information channel prevails over the instrumentation channel (if any). In addition, we found evidence for a negative non-donor-specific effect only for the less poor aid recipient countries of our sample, suggesting that a development channel prevails over a credit constraint effect (if any) for the less poor countries only. This result is in line with findings of scholars showing a limited impact of aid on growth in the poorest recipient countries (Burnside and Dollar, 2000; Clemens et al., 2012): if aid has little impact on living standards in these countries, it is very unlikely that the development and credit constraint channels are large, as evidenced by Clemens and Postel (2018).

From a policy perspective, our results suggest that bilateral foreign aid used by donor countries as a *policy tool* to lower individuals' incentives to migrate from the aid recipient country to the donor country is rather inefficient, at least in the short run. From the perspective of a donor country wishing to decrease migration from a given poor recipient country, more should be allocated to multilateral aid than to bilateral aid: according to our results, this would reduce immigration from that country through an increase in the development channel (provided the recipient country is not too poor), and a decrease in the information channel.

References

Alesina, A., and D. Dollar. 2000. "Who Gives Foreign Aid to Whom and Why?" *Journal of Economic Growth*, 5(1): 33–63.

Angelucci, M. 2015. "Migration and Financial Constraints: Evidence from Mexico." *The Review of Economics and Statistics*, 97(1): 224–228.

Annen, K., and S. Knack. 2020. "Better Policies from Policy-Selective Aid?" *The World Bank Economic Review*, 0: 1–16.

Azam, J.-P., and R. Berlinschi. 2009. "L'aide contre l'immigration." *Revue d'économie du développement*, 17(4): 381–108.

Beine, M., and C. Parsons. 2015. "Climatic Factors as Determinants of International Migration." *The Scandinavian Journal of Economics*, 117(2): 723–767.

Beine, M., and C. Parsons. 2017. "Climatic Factors as Determinants of International Migration: Redux." *CESifo Economic Studies*, 63(4): 386–402.

Beine, M., F. Docquier, and Ç. Özden. 2011. "Diasporas." *Journal of Development Economics*, 95(1): 30–41.

Beine, M., S. Bertoli, and J. Fernández-Huertas Moraga. 2015. "A Practitioners' Guide to Gravity Models of International Migration." *The World Economy.*

Bermeo, S. B., and D. Leblang. 2015. "Migration and Foreign Aid." *International Organization*, 69(3): 627657.

Berthélemy, J.-C. 2006. "Bilateral Donors' Interest vs. Recipients' Development Motives in Aid Allocation: Do All Donors Behave the Same?" *Review of Development Economics*, 10(2): 179–194.

Berthélemy, J.-C., M. Beuran, and M. Maurel. 2009. "Aid and Migration: Substitutes or Complements?" *World Development*, 37(10): 1589–1599.

Bhargava, A., and F. Docquier. 2007. "A New Panel Data Set on Physicians Emigration Rates (19912004)." Washington, DC: World Bank Report.

Biscaye, P. E., T. W. Reynolds, and C. L. Anderson. 2017. "Relative Effectiveness of Bilateral and Multilateral Aid on Development Outcomes." *Review of Development Economics*, 21(4): 1425–1447.

Bulíř, A., and A. J. Hamann. 2008. "Volatility of Development Aid: From the Frying Pan into the Fire?" *World Development*, 36(10): 2048–2066.

Burnside, C., and D. Dollar. 2000. "Aid, Policies, and Growth." *The American Economic Review*, 90(4): 847–868.

Carter, P., N. Van de Sijpe, and R. Calel. 2021. "The Elusive Quest for Additionality." *World Development*, 141: 105393.

Clemens, M. A., and H. M. Postel. 2018. "Deterring Emigration with Foreign Aid: An Overview of Evidence from Low-Income Countries." *Population and Development Review*, 44(4): 667–693.

Clemens, M. A., S. Radelet, R. R. Bhavnani, and S. Bazzi. 2012. "Counting Chickens when they Hatch: Timing and the Effects of Aid on Growth." *The Economic Journal*, 122(561): 590–617.

Davies, R. B., and S. Klasen. 2019. "Darlings and Orphans: Interactions across Donors in International Aid." *The Scandinavian Journal of Economics*, 121(1): 243–277.

Defoort, C., and G. Rogers. 2008. "Long Trends in International Migration: An Analysis of the 6 Main Receiving Countries." *Population*, 63: 285–317.

Dreher, A., A. Fuchs, and S. Langlotz. 2019. "The Effects of Foreign Aid on Refugee Flows." *European Economic Review*, 112: 127–147.

Dreher, A., A. Fuchs, B. Parks, A. Strange, and M. J. Tierney. 2021. "Aid, China, and Growth: Evidence from a New Global Development finance dataset." *American Economic Journal: Economic Policy*, 13(2): 135–74.

Gamso, J., and F. Yuldashev. 2018*a*. "Does Rural Development Aid Reduce International Migration?" *World Development*, 110: 268–282.

Gamso, J., and F. Yuldashev. 2018*b*. "Targeted Foreign Aid and International Migration: Is Development-Promotion an Effective Immigration Policy?" *International Studies Quarterly*, 62(4): 809–820.

Head, K., T. Mayer, and J. Ries. 2010. "The Erosion of Colonial Trade Linkages After Independence." *Journal of International Economics*, 81(1): 1–14.

Howell, A. 2022. "Impact of a Guaranteed Minimum Income Program on Rural-Urban Migration in China." *Journal of Economic Geography.*

Hudson, J. 2013. "Promises Kept, Promises Broken? The Relationship between Aid Commitments and Disbursements." *Review of Development Finance*, 3(3): 109–120.

Lahiri, S., and P. Raimondos-Møller. 2000. "Lobbying by Ethnic Groups and Aid Allocation." *The Economic Journal*, 110(462): C62–C79.

Lanati, M., and R. Thiele. 2018*a*. "Foreign Assistance and Migration Choices: Disentangling the Channels." *Economics Letters*, 172: 148–151.

Lanati, M., and R. Thiele. 2018*b*. "The Impact of Foreign Aid on Migration Revisited." *World Development*, 111: 59–74.

Lanati, M., and R. Thiele. 2020*a*. "Foreign Assistance and Emigration: Accounting for the Role of NonTransferred Aid." *The World Economy*, 43: 1951–1976.

Lanati, M., and R. Thiele. 2020*b*. "International Student Flows from Developing Countries: Do Donors Have an Impact?" *Economics of Education Review*, 77.

Lewbel, A. 1997. "Constructing Instruments for Regressions with Measurement Error When No Additional Data Are Available, With An Application To Patents and R&D." *Econometrica*, 55(5): 1201–1213.

Marchal, L., and C. Naiditch. 2020. "How Borrowing Constraints Hinder Migration: Theoretical Insights from a Random Utility Maximization Model." *The Scandinavian Journal of Economics*, 122(2): 732–761.

Mayda, A. M. 2010. "International Migration: A Panel Data Analysis of the Determinants of Bilateral Flows." *Journal of Population Economics*, 23(4): 1249–1274.

Mayer, T., and S. Zignago. 2011. "Notes on CEPII's Distances Measures: The GeoDist Database." CEPII Working Paper 2011-25.

McFadden, D. L. 1974. "The Measurement of Urban Travel Demand." *Journal of Public Economics*, 3: 303–328.

McFadden, D. L. 1984. "Econometric Analysis of Qualitative Response Models." In *Handbook of Econometrics*. Vol. 2, , ed. Z. Griliches and M. Intriligator. North-Holland, Amsterdam:Elsevier.

Menard, A., and A. Gary. 2020. "Aid, Trade and Migration: How Do Bilateral Flows Interact?" *The World Economy*, 41(2): 431–456.

Milner, H. V., and D. Tingley. 2013. "The Choice for Multilateralism: Foreign Aid and American Foreign Policy." *The Review of International Organizations*, 8(3): 313–341.

Moullan, Y. 2013. "Can Foreign Health Assistance Reduce the Medical Brain Drain?" *The Journal of Development Studies*, 49(10): 1436–1452.

Mughanda, M. 2011. "Inquiry on Self-Interested Foreign Aid: Insights From the ODA-Migrations Link in SSA Countries." *African Journal of Political Science and International Relations*, 5(4): 164–173.

Murat, M. 2020. "Foreign Aid, Bilateral Asylum Immigration and Development." *Journal of Population Economics*, 33: 79–114.

Neumayer, E., and T. Plümper. 2010. "Making Spatial Analysis Operational: Commands for Generating Spatial-Effect Variables in Monadic and Dyadic Data." *The Stata Journal*, 10(4): 585–605.

OECD. 2020*a*. "Creditor Reporting System Aid Activity database." OECD Development finance data, https://www.oecd.org/dac/financing-sustainable-development (accessed on 20 October 2022).

OECD. 2020*b*. "International Migration Database." OECD International Migration Statistics, https://doi.org/10.1787/data-00342-en (accessed on 20 October 2022).

Ontiveros, U. D., and V. Verardi. 2012. "Does Aid Induce Brain Drain? A Panel Data Analysis." *IZA Journal of Migration*, 1(1): 13.

Ortega, F., and G. Peri. 2013. "The Effect of Income and Immigration Policies on International Migration." *Migration Studies*, 1(1): 47–74.

Schraeder, P. J., S. W. Hook, and B. Taylor. 1998. “Clarifying the Foreign Aid Puzzle: A Comparison of American, Japanese, French, and Swedish Aid Flows.” *World Politics*, 50(2): 294–323.

Temple, J., and N. Van de Sijpe. 2017. “Foreign Aid and Domestic Absorption.” *Journal of International Economics*, 108: 431 – 443.

Tierney, M. J., D. L. Nielson, D. G. Hawkins, J. T. Roberts, M. G. Findley, R. M. Powers, B. Parks, S. E. Wilson, and R. L. Hicks. 2011. “More Dollars than Sense: Refining Our Knowledge of Development Finance Using AidData.” *World Development*, 39(11): 1891–1906.

On-line Appendix

A Derivations from the RUM Model

According to equation (2), the bilateral migration rate at time t can be written as follows:

$$\ln \text{Mig}_{od,t} = W_{od,t} - C_{od,t} - W_{oo,t}. \tag{A.1}$$

For any variable X impacting utilities and migration costs, such as foreign aid received by country o, equation (A.1) implies that:

$$\frac{\partial \text{Mig}_{od,t}}{\partial X} = \left[\frac{\partial \left(W_{od,t} - C_{od,t}\right)}{\partial X} - \frac{\partial W_{oo,t}}{\partial X}\right] \text{Mig}_{od,t}. \tag{A.2}$$

The *development channel* implies that any increase in aid will increase the utility in the origin country of potential migrants such that:

$$\frac{\partial W_{oo,t}}{\partial \text{Aid}_{do,t-1}} \geqslant 0 \, \forall d. \tag{A.3}$$

On the other hand, the *credit constraint channel* implies that any increase in aid implies an alleviation of the credit constraint, which can be modelled through a decrease in all bilateral migration costs:

$$\frac{\partial C_{od,t}}{\partial \text{Aid}_{d'o,t-1}} \leqslant 0 \, \forall \left(d, d'\right). \tag{A.4}$$

The RUM model does not explicitly take into account the credit constraint of individuals (the consequences of this omission are dealt with by Marchal and Naiditch, 2020). We therefore follow the bulk of related papers and resort to this assumption to take into account the impact of aid on the credit constraint of potential migrants (Beine, Bertoli and Fernández-Huertas Moraga, 2015).

The *information and instrumentation channels* imply that when a donor country increases its aid to a recipient country, it has an impact on the corresponding bilateral migration costs. This impact is negative for the information channel:

$$\frac{\partial C_{od,t}}{\partial \text{Aid}_{do,t-1}} \leqslant 0 \, \forall d, \tag{A.5}$$

and positive for the instrumentation channel:

$$\frac{\partial C_{od,t}}{\partial \text{Aid}_{do,t-1}} \geqslant 0 \, \forall d. \tag{A.6}$$

B Survey of the Empirical Literature

Table A.1: Survey of Empirical Studies on the Aid-Migration Nexus

Study	Causality	Period	Origin (recipient)	Destination (donor)	Migration data	Aid data	Aid type	Endo-geneity	Total aid	Bil. aid	Channels
Angelucci (2015)	Aid → Mig.	1998	Mexico	United States (Mexican states)	Census data[a]	Census data[a]	Cash transfers	Treatment	+		Cred.
Azam & Berlinschi (2009)	Aid→ Mig.	1995-2003	Low/lower middle-inc. c.	22 OECD c.	OECD	OECD	Disbursements	Additional controls	-		Inst.
Berthélemy et al. (2009)	Aid → Mig.	2000	187 c.	22 OECD c.	World Bank	OECD	Disbursements	System of equations	+	+	Cred. Info.
Dreher et al. (2019)	Aid → Refugees	1976-2013	141 c.	28 OECD c.	UNHCR	OECD	Disbursements	IVs	-	+/-	Dev. Info. Inst.
Gamso & Yuldashev (2018a)	Aid → Mig.	1995-2010	103 c.	20 OECD c.	IAB	AidData	Commitments	IVs, PSM		0/-	Dev.
Gamso & Yuldashev (2018b)	Aid → Mig.	1985-2010	101 c.	20 OECD c.	IAB	AidData	Commitments	IVs		0/-	Dev.
Howell (2022)	Aid → Mig.	2012	China	China	Census data[b]	Census data[b]	Cash transfers	RDD		+	Cred.
Lanati & Thiele (2018a)	Aid → Mig.	2004-2014	129 c.	25 OECD c.	OECD	OECD	Disbursements	System of equations	-	+	Dev.
Lanati & Thiele (2018b)	Aid → Mig.	1995-2014	141 c.	26 OECD c.	OECD	OECD	Disbursements	System of equations	-	+	Cred. Dev. Info.
Lanati & Thiele (2020a)	Aid → Mig.	2009-2016	125 c.	OECD	OECD	OECD	Disbursements	Two-step approach	-		Dev.
Lanati & Thiele (2020b)	Aid → Int. Student Flows	2008-2015	120 c.	17 OECD c.	UIS UNESCO	OECD	Disbursements	Two-step approach	-		Dev.
Menard & Gary (2020)	Aid → Mig.	2000-2010	153 c.	22 OECD c.	OECD	OECD	Disbursements	System of equations		+	Info.
Moullan (2013)	Aid → Physician Mig.	1998-2004	192 c.	16 OECD c. & South Africa	Bhargava and Docquier (2007)	OECD	Commitments	GMM	-		Dev.
Mughanda (2011)	Aid → Mig.	2004	Sub-Saharan c.	OECD	United Nations	OECD	Not mentioned		+		Cred.
Murat (2020)	Aid → Asylum applications	1993-2013	113 c.	14 OECD c.	UNHCR	OECD	Disbursements	IVs, system GMM		+/-	Cred. Dev.
Ontiveros & Verardi (2012)	Aid → Mig.	1975-2000	195 c.	6 developed c.	Defoort and Rogers (2008)	OECD	Disbursements	IVs, system GMM	+		Cred. Info.

Main empirical results of the literature on the link between foreign aid and migration. [a]: Data come from the Mexico's antipoverty conditional cash transfer programme. [b]: Data come from the China Household Ethnic Survey project and the paper deals with internal migration (rural–urban migration).

C Descriptive Statistics

Table A.2: Summary Statistics

Variable	Mean	Std. Dev.	Min.	Max.	Obs.
Migration					
Bilateral migration rate (in percentage)	0.016	0.081	0	1.623	13,430
Foreign aid					
Bilateral aid (millions of current U.S.$)	27.221	105	0	2,410	13,430
Total bilateral aid (millions of current U.S.$)	1,378	1,666	1.971	11,504	13,430
Rest of bilateral aid (millions of current U.S.$)	1,351	1,643	1.023	11,503	13,430
Multilateral aid (millions of current U.S.$)	106.447	209.814	0.254	2,234	13,430
Control variables					
Bilateral migration stock in the previous decade (thousands of people)	24.032	246.733	0.001	9,367	13,430
Distance between capital cities (kilometres)	7,276	3,676	169.526	18,953	13,430
Common language	0.151	0.358	0	1	13,430
Contiguity	0.003	0.055	0	1	13,430
GDP per capita at origin (billions of current U.S.$)	3.950	3.588	0.226	22.405	13,430
GDP per capita at destination (billions of current U.S.$)	48.865	21.205	9.456	119.173	13,430

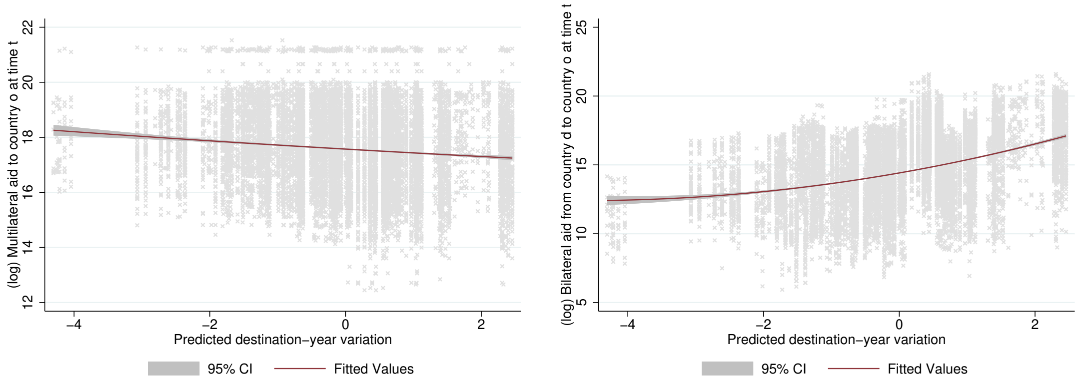
Summary statistics for the main variables of interest.

Table A.3: Correlation Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) ln $\text{Mig}_{od,t}$	1									
(2) ln $\text{Aid}_{do,t-1}$	0.347***	1								
(3) ln $\text{Aid}_{\Lambda o,t-1}$	-0.315***	0.189***	1							
(4) ln $\text{MultiAid}_{o,t-1}$	-0.258***	0.245***	0.693***	1						
(5) ln $\text{Aid}_{o,t-1}$	-0.295***	0.225***	0.997***	0.695***	1					
(6) ln Dist_{od}	-0.197***	0.020*	-0.014	-0.123***	-0.015	1				
(7) Lang_{od}	0.227***	0.143***	-0.175***	-0.084***	-0.158***	0.101***	1			
(8) Contig_{od}	0.080***	0.031***	0.022*	0.018*	0.022*	-0.091***	-0.023**	1		
(9) ln $\text{Mig\_stock}_{od,deca}$	0.556***	0.435***	0.251***	0.155***	0.269***	-0.097***	0.153***	0.105***	1	
(10) ln $\text{GDP}_{o,t-1}/\text{GDP}_{d,t-1}$	0.230***	-0.263***	-0.064***	-0.391***	-0.066***	-0.026**	-0.155***	0.073***	0.143***	1

Correlation coefficients between the dependent and the explanatory variables used in the empirical analysis. ***, ** and * denote significance at the 1%, 5% and 10% level respectively.

Figure A.1: Destination-Year Variations in Migration Rates and Foreign Aid



The graph on the left shows the correlation between destination-year variations in migration rates and multilateral aid flows. The graph on the left shows the correlation between destination-year variations in migration rates and bilateral aid flows.

D Robustness Tests

Table A.4: Alternative Instrumental Variables

	ln $\text{Mig}_{od,t}$	
	Spatial lag	2nd/3rd moments
Regressions	(1)	(2)
ln $\text{Aid}_{do,t-1}$	0.0765**	0.0972***
	(0.0360)	(0.0086)
ln $\text{Aid}_{\Lambda o,t-1}$	-0.1087***	-0.0963***
	(0.0305)	(0.0290)
ln $\text{Multi}_{o,t-1}$	-0.0371**	-0.0403***
	(0.0149)	(0.0139)
Controls (Γ)	yes	yes
Destination-year FE	yes	yes
Origin FE	yes	yes
Observations	13,430	13,430
Estimator	IV-2SLS	IV-2SLS
1st stage	-0.0168***	-0.0243*** ; 0.8319***
	(0.0022)	(0.0006) ; (0.0633)
K-Paap F Stat.	172.556	762.168
Hansen J-stat (p-value)		0.7352
Transmission channels		
Non-donor-specific channel	-0.0371**	-0.0403***
	(0.0149)	(0.0139)
Channel specific to donor d	0.0787	0.1081***
	$(0.0514)^b$	$(0.0101)^b$
Channel specific to all donors but d	0.3625	0.4148
	$(0.3086)^b$	$(0.2680)^b$

IV-2SLS coefficient estimates with standard errors clustered at the origin-year level in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% level respectively. b indicates that the standard errors have been obtained by non-parametric bootstrap. Γ includes the (log) distance in kilometres between the capital cities of countries o and d, a dummy variable equal to one if the two countries share a common official language and zero otherwise, a dummy variable equal to one if the two countries share a common border and zero otherwise, the (log) bilateral stock of emigrants in the past decade and the (log) ratio of the GDP per capita of the origin and destination countries at time $t-1$.

Table A.5: Alternative Specifications

	ln $Mig_{od,t}$					
Regressions	(1)	(2)	(3)	(4)	(5)	(6)
ln $Aid_{do,t-1}$	0.3991***	0.0957***	0.1555***	0.1597***	0.1582***	0.1582***
	(0.0076)	(0.0192)	(0.0086)	(0.0070)	(0.0175)	(0.0157)
ln $Aid_{\Lambda o,t-1}$	-0.2024***	-0.0673**			-0.0598	-0.0598
	(0.0433)	(0.0266)			(0.0583)	(0.0450)
ln $Multi_{o,t-1}$	-0.0750***	-0.0398***			-0.0495***	-0.0495***
	(0.0194)	(0.0117)			(0.0182)	(0.0145)
ln $(Multi_{o,t-1} + Aid_{\Lambda o,t-1})$			-0.2621			
			(0.1847)			
ln $Dist_{od}$			-0.5715***	-0.5766***	-0.5748***	-0.5748***
			(0.0277)	(0.0255)	(0.0649)	(0.0630)
$Lang_{od}$			0.6800***	0.6866***	0.6776***	0.6776***
			(0.0377)	(0.0356)	(0.0931)	(0.0856)
$Contig_{od}$			0.0543	0.0535	0.0488	0.0488
			(0.1048)	(0.1228)	(0.2014)	(0.1875)
ln $(GDPcap_{o,t-1}/GDPcap_{d,t-1})$		-0.1820***			-0.1484**	-0.1484***
		(0.0323)			(0.0689)	(0.0431)
ln $Mig\_stock_{od,deca}$			0.3795***	0.3759***	0.3768***	0.3768***
			(0.0093)	(0.0084)	(0.0213)	(0.0172)
Destination-year FE	yes		yes	yes	yes	yes
Origin FE	yes				yes	yes
Origin-destination FE		yes				
Year FE		yes				
Origin-year FE			yes	yes		
Error cluster	origin-year	origin-year	origin-year	origin-year	origin	origin-destination
Observations	13,430	13,215	10,975	13,427	13,430	13,430
Estimator	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS
1st stage	0.8893***	0.9187***	0.7934***	0.8498***	0.8501***	0.8501***
	(0.0060)	(0.0391)	(0.0091)	(0.0075)	(0.0138)	(0.0117)
K-Paap F Stat.	22,018.274	551.106	7,595.153	12,815.402	3,782.036	5,241.969
Transmission channels						
Non-donor-specific channel	-0.0750***	-0.0398***			-0.0495***	-0.0495***
	(0.0194)	(0.0117)			(0.0182)	(0.0145)
Channel specific to donor d	0.4118***	0.1049***			0.1665***	0.1665***
	$(0.0090)^b$	$(0.0235)^b$			$(0.0073)^b$	$(0.0073)^b$
Channel specific to all donors but d	0.7499*	0.4372***			0.5688**	0.5688**
	$(0.4144)^b$	$(0.1058)^b$			$(0.2687)^b$	$(0.2687)^b$

IV-2SLS coefficient estimates with clustered standard errors in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% level respectively. b indicates that the standard errors have been obtained by non-parametric bootstrap. The (log) ratio of the GDP per capita is omitted in columns (3) and (4) due to multicolinearity issues.

Table A.6: Commitment *versus* Disbursement

	ln $\text{Mig}_{od,t}$	
Regressions	(1)	(2)
ln $\text{Aid}^{\text{dis}}_{do,t-1}$	0.1532***	0.1646***
	(0.0071)	(0.0072)
ln $\text{Aid}^{\text{dis}}_{\Lambda o,t-1}$	-0.1216***	-0.1181***
	(0.0200)	(0.0203)
ln $\text{Multi}^{\text{dis}}_{o,t-1}$	0.0067	0.0063
	(0.0079)	(0.0079)
Controls (Γ)	yes	yes
Destination-year FE	yes	yes
Origin FE	yes	yes
Observations	13,430	13,430
Estimator	IV-2SLS	IV-2SLS
K-Paap F Stat.	10,183.541	10,034.429
1st stage	0.8081***	0.8131***
	(0.0080)	(0.0081)
Transmission channels		
Non-donor-specific channel	0.0067	0.0063
	(0.0079)	(0.0079)
Channel specific to donor d	0.1523***	0.1638***
	$(0.0064)^b$	$(0.0066)^b$
Channel specific to all donors but d	-0.2159	-0.2058
	$(0.1824)^b$	$(0.1828)^b$

IV-2SLS coefficient estimates with standard errors clustered at the origin-year level in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% level respectively. b indicates that the standard errors have been obtained by non-parametric bootstrap. Γ includes the (log) distance in kilometres between the capital cities of countries o and d, a dummy variable equal to one if the two countries share a common official language and zero otherwise, a dummy variable equal to one if the two countries share a common border and zero otherwise, the (log) bilateral stock of emigrants in the past decade and the (log) ratio of the GDP per capita of the origin and destination countries at time $t-1$. The superscript *dis* stands for disbursements of aid flows. In column (1), aid disbursements are instrumented using disbursements flows. In column (2), aid disbursements are instrumented using commitments flows.