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From dollars to departures: donor vs. non-donor effects of foreign aid on migration

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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 framework derived from a RUM model, using OECD data from 2011 to 2019, and an instrumentation strategy to infer causality. We distinguish between the donor- and non-donor-specific channels by including multilateral aid into the model. We find evidence that aid donated by a country increases migration to that country through a donor-specific information channel. If this channel were the only one at play, a 1% increase in bilateral aid per capita would induce a 0.55% increase in the migration rate to the donor country. We also find a non-donor-specific impact of aid on migration from the richer origin countries equal to 0.02%.

Keywords - Aid, Gravity, Migration, RUM
JEL classification - F22, F35, O15

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Conflict of interest

The authors declare that they have no conflict of interest.

Data availability statement

All data analysed in this study are described and included in the replication material provided in the online resource.

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, reduce the incentives for individuals to emigrate. This development-friendly policy is often presented as more effective than physical and bureaucratic barriers to entry, which often raise humanitarian concerns. For instance, in 2015, the European Commission presented a European Agenda on Migration to provide means of managing both irregular and 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 (see Clemens & Postel, 2018, for a review of the literature).

Four transmission channels have been highlighted in the literature so far. First, some studies find that aid reduces migration through a *development channel* by increasing disposable income in the origin country (Dreher *et al.*, 2019; Gamso & Yuldashev, 2018a,b; Lanati & Thiele, 2018a,b, 2020b,a; Moullan, 2013; Murat, 2020).[1] Second, aid fosters migration through a *credit constraint channel* by providing individuals who wish to emigrate with the financial means to do so (Angelucci, 2015; Berthélemy *et al.*, 2009; Fitchett & Wesselbaum, 2022; Lanati & Thiele, 2018b; Mughanda, 2011; Murat, 2020; Ontiveros & Verardi, 2012).[2] Third, bilateral aid increases migration through an *information channel* by providing the population of the recipient country with information about the donor country. This, in turn, decreases the costs of migration to that particular country (Berthélemy *et al.*, 2009; Dreher *et al.*, 2019; Menard & Gary, 2020; Ontiveros & Verardi, 2012). Finally, the effect of aid takes place through an *instrumentation channel* when the donor country strategically uses bilateral aid to push the recipient country into tightening its emigration policy (Azam & Berlinschi, 2009; Dreher *et al.*, 2019). The first two channels are non-donor-specific, while the last two are donor-specific as they point to a relationship between bilateral aid and the reverse bilateral migration. Yet, the question of whether foreign aid effectively decreases migration, and especially through which channels, remains unclear. This article intends to address this issue.

In this article, we propose a strategy to identify the impact of foreign aid on migration with a special focus on the donor and non-donor transmission channels. First, we build a random utility maximisation (RUM) model of migration, allowing us to derive a gravity model. The RUM model has been employed in similar settings before (see Beine *et al.*, 2015). However, our model is the first to include multilateral aid and use it for identifying the channels through which aid may impact migration.

We rely on the gravity framework to estimate the causal impact of foreign aid per capita on migration. To this end, we use OECD data from 2011 to 2019 and estimate the effects of aid from a donor to a recipient country on the reverse bilateral migration rate, as well as the impacts of bilateral aid from other countries than d, and multilateral aid. To infer causality, we use an IV-2SLS strategy with an instrument for bilateral aid. This instrument is constructed by re-

[1] This strand of literature assumes that aid has a positive impact on welfare, hence on development. However, the literature on aid effectiveness is mixed. Some scholars show that aid improves welfare (Burnside & Dollar, 2000; Dreher *et al.*, 2021; Hansen & Tarp, 2000), while others demonstrate an opposite effect of aid on welfare (Easterly, 2003; Nunn & Qian, 2014).

[2] Here, again, this strand of literature assumes that aid has a positive impact on welfare and relaxes financial constraints by increasing disposable income at the origin country.

weighting the total aid given by the donor in one period based on the donor's initial share of the aid budget devoted to the origin country. We then use our estimates to distinguish donor- from non-donor-specific channels.

Our identification strategy relies on two features of multilateral aid. First, its effect can *only* be associated with a non-donor-specific effect of aid because the identity of the donor countries is unknown when aid is conveyed through a multilateral agency such as the United Nations or the World Bank. Second, bilateral and multilateral aid have the same marginal impact on living standards in receiving countries (Biscaye *et al.*, 2017).

We find evidence that bilateral aid has a positive impact on the reverse migration rate. The effect of bilateral aid is primarily conveyed through an information channel (which prevails over an instrumentation channel, if any). If that channel were the only one at play, a 1% increase in bilateral aid per capita would induce a 0.55% increase in the migration rate to the donor country. Multilateral aid has a positive impact on migration through the non-donor specific channels, especially for the richer origin countries. In these countries, a 1% increase in multilateral aid per capita induces a 0.02% increase in migration. The results are robust to alternative specifications.

To the best of our knowledge, this is the first study to quantify the donor- and non-donor-specific transmission channels through which foreign aid affects migration.[3] 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 & Thiele (2018b). 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 multilateral aid and bilateral aid from other countries than d into the model, instead of the total aid received. This specification thus corrects for double counting and for an omitted variable bias caused by the omission of multilateral aid.

The rest of the paper is organised as follows. In section 2, we present the theory and a survey of the literature. In section 3, we discuss the empirical strategy. In section 4, we present the empirical results and a set of robustness tests. Section 5 concludes.

2 A RUM model of migration with foreign aid

We derive our theoretical insights from a random utility maximisation model of migration (Beine *et al.*, 2015). This model offers a gravity framework that we estimate to quantify the donor- and the non-donor-specific impact of aid on migration.

2.1 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 destination corresponds a distinct level of utility, depending on the characteristics of the individual, the origin, and the destination country. Let $U_{iod,t}$ denote the utility that an 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 *et al.* (2015), we assume that she makes

[3] Lanati & Thiele (2018a) distinguish between the development and the credit constraint channels incorporating late- and early-impact aid in a gravity framework.

myopic decisions, deciding whether to migrate or not and where to migrate to at each period of her lifetime.

The utility of individual i 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, denoted as $\varepsilon_{iod,t}$. 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, the utility of individual i migrating from country o to country d at time t can be expressed as:

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

As is 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 $\text{Mig}_{od,t}$, represents the ratio of the unconditional probability that an individual relocates from country o to destination d at time t to 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 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), which implies that changes in the attractiveness or accessibility of alternative destinations do not impact the bilateral migration rate (Beine *et al.*, 2015).

2.2 The channels

For any variable X impacting utilities and migration costs, such as foreign aid received by country o, Equation (2) implies that:

$$\frac{\partial \text{Mig}_{od,t}}{\partial X} = \left[\frac{\partial \left(W_{od,t} - C_{od,t}\right)}{\partial X} - \frac{\partial W_{oo,t}}{\partial X}\right] \text{Mig}_{od,t}. \tag{3}$$

A donor-specific impact means 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 expected to be negative for the *information channel* ($\partial C_{od,t}/\partial \text{Aid}_{do,t'} \leqslant 0 \; \forall d, \forall t' < t$), and positive for the *instrumentation channel* ($\partial C_{od,t}/\partial \text{Aid}_{do,t'} \geqslant 0 \; \forall d, \forall t' < t$).

A non-donor-specific impact means that an increase in aid received by a country (regardless of its source) has an impact on the utility in the origin country and/or on the credit constraint of potential migrants. The interpretation of the non-donor-specific impact depends on whether aid fosters or deters welfare in the recipient country.

The literature on aid effectiveness is extensive and results are mixed. Some scholars show that aid improves welfare and relaxes credit constraints (Burnside & Dollar, 2000; Dreher *et al.*, 2021; Hansen & Tarp, 2000), while others demonstrate an opposite and deteriorating effect (Easterly, 2003; Nunn & Qian, 2014). Some find no robust effect (Doucouliagos & Paldam, 2008; Rajan & Subramanian, 2008), or a moderate and positive effect size (Clemens *et al.*, 2012).

If we follow the aid-migration literature and assume that aid has a *positive* impact on the welfare of the recipient country, a negative non-donor-specific impact of aid implies the presence of a *development channel.* Any increase in aid will enhance the utility of potential migrants in the origin country ($\partial W_{oo,t}/\partial \text{Aid}_{do,t'} \geqslant 0 \, \forall d, \forall t' < t$). On the other hand, a positive non-donor-specific impact implies the presence of a *credit constraint channel.* Any increase in aid results in an alleviation of the credit constraint, which can be modelled through a decrease in all bilateral migration costs ($\partial C_{od,t}/\partial \text{Aid}_{d'o,t'} \leqslant 0 \, \forall \, (d, d') \, , \forall t' < t$).[4]

However, if aid has a *negative* impact on the welfare of the recipient country, an increase in aid could either decrease the utility in the origin country, or exacerbate the credit constraint of potential migrants. The latter can be modelled through an increase in all bilateral migration costs. In this paper, we will identify the direction of the non-donor-specific impact of aid on migration, irrespective of the impact of aid on the welfare of the receiving country.

2.3 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 except d. Depending on the prevailing channel, multilateral and bilateral aid have a different impact on migration rates. The results are summarised in Table 1 for a positive impact of aid on the recipient country.

First, in the case of multilateral aid, 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. Assuming a positive impact of aid on the welfare of the receiving country, the effect of multilateral aid on migration to *any country* will be negative if the development channel prevails, and positive if the credit constraint channel prevails. The effect of multilateral aid will be reversed if we assume a negative impact of aid on the recipient economy.

Second, bilateral aid affects migration through both donor-specific *and* non-donor-specific channels. Regarding 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.

[4]The RUM model does not explicitly incorporate the credit constraint of individuals (the consequences of this omission are dealt with by Marchal & 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 *et al.*, 2015).

Table 1: Impact of foreign aid on migration when aid improves welfare

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

Theoretical impact of foreign aid on the migration rate to country d. In this table, we assume a positive impact of aid on the welfare of the recipient country. Yet, if aid has a negative impact on the economy of the recipient country, an increase in aid could result in opposite non-donor-specific effects (the signs would be reversed).

2.4 Empirical evidence

Related empirical studies are listed in Appendix A, Table A.1. Most papers assume that aid has a positive impact on the welfare of the recipient countries. In that context, several articles find supportive evidence for the development channel hypothesis. Lanati & Thiele (2018a,b, 2020a,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 & Yuldashev (2018a,b) and Moullan (2013). In addition, Dreher *et al.* (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, 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 *et al.* (2009) find this channel to be especially at play for unskilled individuals, whereas Ontiveros & Verardi (2012) show its relevance for skilled individuals. This positive relationship is also put forward by Fitchett & Wesselbaum (2022); Mughanda (2011); Murat (2020).

There is only limited evidence on the information effect of bilateral aid on reverse migration. Berthélemy *et al.* (2009) as well as Ontiveros & Verardi (2012) find support for this transmission channel, especially in the case of skilled migrants. Lanati & Thiele (2018b) and Menard & Gary (2020) confirm this impact. Dreher *et al.* (2019) suggest that the image of destination countries could be a potential reason for their finding of a short-run positive effect of aid on refugee flows.

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

3 Empirical strategy

3.1 Data, statistics and facts

The data. We use the OECD International Migration Database (OECD, 2020b), which comprises bilateral migration flow data for 37 destination countries from 1975 to 2019. These destinations include most OECD countries and some non-OECD countries. We use the variable labelled *total immigrant population*. This database compiles data reported by national statistical offices. For most countries (but not all), the data excludes irregular migrants and refugees.

We use data on foreign aid from the OECD-DAC Creditor Reporting System Aid Activity database (OECD, 2020a). This database is the most comprehensive information source to date, tracking international financial aid flows. It contains disbursement and commitment flows for all DAC members from 1995 until 2019. Our analysis relies on aid disbursements and we use aid commitments in robustness tests. In addition, we rely on both bilateral and multilateral aid flows. Multilateral aid includes transfers conveyed through a multilateral organisation.[5] Examples of multilateral organisations include the United Nations and the World Bank, among others. Donors may choose to rely on multilateral agencies instead of providing bilateral aid for various reasons, such as avoiding interacting with the recipient country or delegating liability to the implementing agency (see Eichenauer & Reinsberg, 2017, for a brief summary of the reasons). In what follows, we consider only core contributions to build multilateral aid flows. Finally, multilateral aid transfers are reported only from 2011 onward, this is why our sample period starts in 2011.

In addition, we use the Gravity database from CEPII that provides data on countries' GDP per capita to perform gravity-type analyses (Head *et al.*, 2010). We further use population data from the World Development Indicators of the World Bank.

Descriptive statistics. We obtain a sample covering 30 destination countries and 130 origin countries over the period 2011-2019. We report a number of summary statistics in Appendix B, Table A.2 and A.3. Table A.2 shows that origin countries exhibit an average migration rate of 1.6%. Note that our sample does not include migration rates equal to zero.[6] Our main explanatory variable is the amount of aid per capita, which is calculated by dividing the aid flows by the population of the recipient country. On average, a recipient country receives approximately 114.80 USD of bilateral aid per capita from all donors, 5.70 USD of bilateral aid per capita from a single donor country, and 6.54 USD of multilateral aid per capita.

Table A.3 shows the correlation between bilateral aid per capita, aid per capita donated by other countries than d, and multilateral aid per capita. All types of aid are positively correlated with one another. Bilateral and multilateral aid are likely to target the same recipient countries (Eichenauer & Reinsberg, 2017). Furthermore, the donor countries presented in this analysis are mostly DAC members which are the largest founders of the multilateral development system. Calls

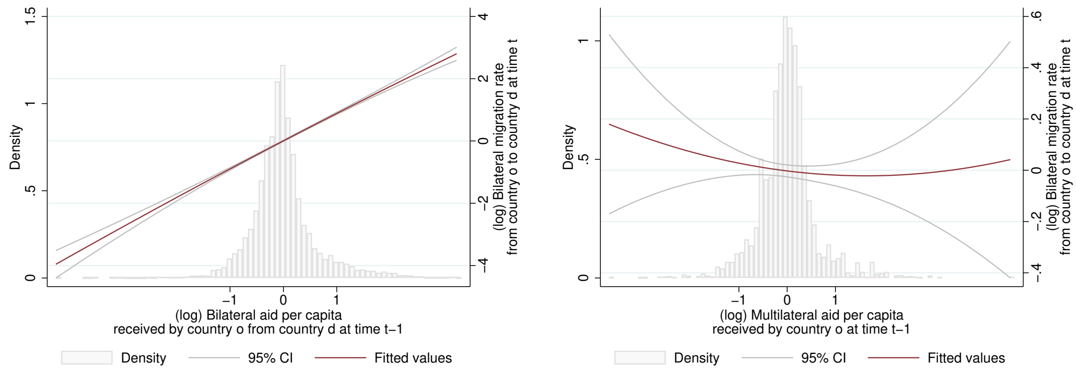
[5] More precisely, we only consider contributions to the regular budget (core contributions) of the multilateral agency, where individual countries have no leeway in the distribution of their contributions (OECD, 2020c). This is in contrast to non-core contributions, also referred to as *earmarked* or *multi-bi* funding, which represent resources channelled through multilateral organisations that allow donors to retain control over the disposal of the funds (OECD, 2020c; Eichenauer & Reinsberg, 2017).

[6] Our strategy consists in analysing the impact of aid on migration for a sample of recipient countries that receive a positive amount of aid. Using recipient countries that have at least once been aid recipient over the period is in line with Dreher *et al.* (2019). While the dataset does not include null bilateral aid flows, it includes null multilateral aid flows (countries not receiving multilateral aid). Our sample only contains positive bilateral migration rates due to the restriction imposed that countries in our dataset receive some amount of aid. Therefore, we analyse the impact of aid *conditional* on receiving aid.

on DAC members to contribute to joint agenda-settings, such as the Agenda 2030 for Sustainable Development Goals or the Paris Agreement, increase the contributions to multilateral organisations (OECD, 2020c). This may explain the positive correlation between bilateral and multilateral aid.

Stylised facts. Our main variable of interest is the bilateral migration rate between an origin country and a destination country. 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 rates in Figure 1. We find a positive correlation between bilateral migration rates and bilateral aid per capita that could indicate the prevalence of an information channel. We find a slightly negative correlation between bilateral migration rates and multilateral aid per capita. 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 to shed light on these transmission channels.

Figure 1: Bilateral Migration and Foreign Aid



Statistical relationships between (log) bilateral migration rates and (log) aid per capita. The graph on the left shows a quadratic fit of the (log) bilateral aid per capita received by country o from country d against the (log) bilateral rate of migration from country o to country d. The graph on the right shows a quadratic fit of the (log) multilateral aid per capita received by country o against the (log) bilateral rate of migration from country o to country d. Origin country, destination country and time trends have been partialled out. The graphs also report the distribution of observations used to compute the fit.

3.2 Identification of the impacts of foreign aid

Baseline model. Following the existing literature and our theoretical model, Equation (2) can be estimated as follows:

$$\begin{aligned}\ln \mathrm{Mig}_{od,t} =& \beta_0 + \beta_1 \ln\left(\mathrm{BILpc}_{do,t-1}\right) + \beta_2 \ln\left(\mathrm{BILpc}_{\Lambda o,t-1}\right)\\ &+ \beta_3 \ln\left(\mathrm{MULTIpc}_{o,t-1}\right) + B'\Gamma + \gamma_{od} + \gamma_{dt} + \epsilon_{od,t}\end{aligned} \tag{4}$$

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 amount of bilateral aid per capita donated by country d to country o at time $t-1$, denoted $\mathrm{BILpc}_{do,t-1}$, the amount of bilateral aid per capita donated by other countries than d to country o at time $t-1$, denoted

$\text{BILpc}_{\Lambda o,t-1}$, and the amount of multilateral aid per capita donated to country o at time $t-1$, denoted $\text{MULTIpc}_{o,t-1}$.[7] This approach is similar to the one used in Murat (2020).

We control for the (log) ratio of the GDP per capita of the destination country to the GDP per capita of the origin country at time $t-1$. This variable serves as a proxy for the wage ratio between destination and origin countries, and is considered to be an important control variable in the literature since the seminal paper of Harris & Todaro (1970).

We include origin-destination and destination-year fixed effects (FE) denoted γ_{od} and γ_{dt}, respectively. Origin-destination fixed effects capture time-invariant dyadic characteristics such as the distance between the origin and the destination countries. Destination-year fixed effects partly control for multilateral resistance to migration (e.g. Beine *et al.*, 2011; Beine & Parsons, 2015, 2017). In addition, these fixed effects control for migration policies at destination, which could severely bias the estimations if not accounted for (Ortega & Peri, 2013; Mayda, 2010). Alternative fixed-effect structures will be considered later in the paper. We follow the literature by clustering standard errors within the origin-year dimension.

Instrumentation strategy. To obtain causal results, we rely on an instrumental variable (IV) strategy. In a dyadic gravity framework, the main source of endogeneity that could bias the estimation of Equation (4) is due to a reverse causality bias running from migration to aid. As Lanati & Thiele (2020a) argue, it is the bilateral part of total aid that is potentially affected by bilateral migration. For instance, the lobbying efforts of migrants from one origin country in their host country may lead to an increase in the reverse bilateral aid (Lahiri & Raimondos-Møller, 2000; Bermeo & 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 & Leblang, 2015). Besides, some countries donate aid based on altruism while others attribute aid based on economic and political concerns (Berthélemy, 2006; Annen & Knack, 2020). Yet, these concerns may be correlated with migration decisions and therefore induce a simultaneity bias in the results.

In contrast, development aid from countries other than d is less prone to the issue of reverse causality. For example, the migration flow from Gambia to France could be influenced by aid received by Gambia from countries other than France: It can assist Gambians in overcoming the costs associated with migrating to France. However, bilateral migration from Gambia to France is unlikely to affect aid flows from other donors towards Gambia. Furthermore, multilateral aid is a monadic variable which is not specific to the donor country (i.e. to the destination country of migrants). Therefore, endogeneity issues mostly arise from the link between bilateral migration rates and bilateral aid.

Another endogeneity threat comes from potential omitted variables that could determine migration decisions and be correlated with bilateral aid. These omitted variables may affect other types of aid as well. For instance, some major transient problem – and therefore not captured by our set of fixed effects – may hit a developing country and generate an increase in the amount of (multilateral) aid received by that country, and simultaneously affect migration decisions of its inhabitants. To address this endogeneity issue and instrument each type of aid, it would be essential to find uncorrelated instruments to avoid multicollinearity issues that could lead to unreliable

[7] To maintain zeros after log transformation, the independent variables are increased by one.

coefficient estimates. The existing literature, however, does not offer such instruments.[8] As a result, we instrument bilateral aid but not the rest of bilateral aid, nor multilateral aid.

To instrument bilateral aid per capita, we rely on a shift-share instrument (also known as a Bartik instrument; Bartik 1991). We build the amount of *predicted* aid sent to country o by a donor country d at time t (denoted as $IV_{do,t}$) using the initial share of aid sent to country o by donor country d, multiplied by the total bilateral aid donated by country d at time t. Then, we divide the amount of *predicted* aid by the population of the recipient country to obtain predicted aid per capita. The instrument reads as follows:

$$\mathrm{IV}_{do,t} = \frac{\mathrm{Aid}_{do,t_0}}{\mathrm{Aid}_{d,t_0}} \mathrm{Aid}_{d,t} \frac{1}{\mathrm{Pop}_{o,t}} \quad \forall t > t_0 \tag{5}$$

where t_0 denotes the first year a country pair enters the sample, Aid_{do,t_0} denotes the bilateral aid provided by a donor country d to a recipient country o in the first year, and Aid_{d,t_0} and $\mathrm{Aid}_{d,t}$ denote the total bilateral aid provided by a donor country d in the first year and at time t, respectively. A similar instrument was first proposed by Temple & Van de Sijpe (2017) and has gained strong support from the aid literature (among others, see Dreher *et al.*, 2021; Carter *et al.*, 2021; Fitchett & Wesselbaum, 2022).

This instrument exploits changes in the total budgets of donor countries. It should isolate changes in aid receipts that are not driven by the economic conditions of aid recipients. By adopting this approach, we assume that, although the total amount of aid donated 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 and supply of aid that could be caused by migrants. For instance, our instrumental variable is cleaned from variations that could be caused by differences in the lobbying efforts of migrants from different origin countries (o and $o' \neq o$) living in the same destination country (d). These differences in lobbying could potentially influence the distribution of aid across donor-recipient pairs.

Validity of the instrumentation strategy. The validity of the instrument relies on the exclusion restriction assumption. First, the shift-share instrument should be exogenous to migration. If economic or demographic shocks at the beginning of the sample period (t_0) in the recipient country were correlated with both its emigration and the predicted aid per capita received over the following years, the exclusion restriction would be violated, and the instrument would be invalid.

In Appendix B, Table A.4, we report the correlation between the growth in the migration rate over the first years of the sample period (denoted $\Delta \mathrm{Mig}_{od,2011:2012}$) and the growth in the predicted aid per capita measured by our instrument over the following years (denoted $\Delta \mathrm{IV}_{do,2013:2019}$). The OLS coefficient is reported in column (1) and shows that migration at the beginning of the period is uncorrelated with the instrument over the following years. We find similar results for alternative sub-periods in columns (2) and (3). The fact that past shocks do not affect simultaneously past migration and subsequent changes in the instrument across recipient countries reinforces the instrument's validity.

The difficulty in testing the exclusion restriction assumption in a shift-share setting lies in the fact that the instrument is a weighted average of several shifts varying across donors and time (these shifts are denoted $Aid_{d,t}$ in Equation 5). Following Goldsmith-Pinkham *et al.* (2020), the

[8] Instruments used in the aid-migration literature rely on dyadic variations. For instance, the instrument proposed by Dreher *et al.* (2019) is based on the number of years a country receives aid from a donor, and this indicator varies at the recipient-donor level.

initial shares of aid (denoted $\text{Aid}_{do,t_0}/\text{Aid}_{d,t_0}$ in Equation 5) that serve as weights may be endogenous to the dependent variable. In fact, these initial shares of aid might not be random and could have generated emigration, impacting subsequent emigration through network effects.

Figure A.1 in Appendix B shows the relationship between the initial shares of aid allocated to a recipient country by a donor country, and the corresponding bilateral migration rate. The plot shows no clear correlation, suggesting that the initial shares of aid used as weights are exogenous to migration. The average correlation between these two variables is equal to 6.23%.

3.3 Identification of the transmission channels

Equation (4) allows us to quantify the transmission channels. Our strategy consists in distinguishing the impact of aid that *is not* specific to the donor countries from the impact that *is* donor-specific.

The non-donor-specific impact of aid. To test if a non-donor-specific impact is at play and in which direction, we study the significance and sign of the coefficient β_3. This estimate captures the impact of multilateral aid per capita received by country o on the migration rate from country o to country d.

The donor-specific impact of aid. To quantify the donor-specific impact of aid, we use both coefficients β_1 and β_3. The coefficient β_1 indicates the extent to which the migration rate from country o to country d is affected by aid donated by country d to country o. This coefficient potentially encompasses donor- *and* non-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, while holding constant the entire aid base received by country o (defined as the sum of bilateral and multilateral aid 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 entire aid base received by country o is constant), and the donor-specific channels that vary are only those related to the donor country d. If $\text{BILpc}_{do,t-1}$ increases by 1 percent and $\text{MULTIpc}_{o,t-1}$ decreases by $\text{BILpc}_{do,t-1}/\text{MULTIpc}_{o,t-1}$ percent, then the migration rate changes by $[\beta_1 - \beta_3(\text{BILpc}_{do,t-1}/\text{MULTIpc}_{o,t-1})]$ percent.[9] To obtain an average coefficient, we average observations and then bootstrap the statistics to obtain the standard errors.[10] This coefficient is related to effects specific to donor d; its sign and significance show which of the donor-specific channels prevails, whether it is the information channel or the instrumentation channel (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 $[\beta_2 - \beta_3(\text{BILpc}_{\Lambda o,t-1}/\text{MULTIpc}_{o,t-1})]$, 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 entire aid base received constant).

Discussion. The identification of the transmission channels relies on three assumptions. First, we consider that multilateral aid is *cleaned* from donor-specific effects as it emanates from third-party

[9] At time $t-1$, if bilateral aid increases by $x\%$ while multilateral aid decreases by y percent, with $y = x * (\text{BILpc}_{do,t-1}/\text{MULTIpc}_{o,t-1})$, then the entire aid base received by country o remains constant, as well as the distribution of aid across other donor countries.

[10] We average observations of the sample as follows: $\left[\beta_1 - \beta_3(\overline{\text{BILpc}_{do,t-1}}/\overline{\text{MULTIpc}_{o,t-1}})\right]$, and we bootstrap the statistics by resampling observations (with replacement) from our sample.

agencies. It only includes contributions from agencies' regular budgets to aid recipient countries and excludes earmarked contributions. The recipient country presumably has no knowledge of the origin of this aid. One could argue that the donor countries could still be identified by the recipient country; yet the fact that this aid comes from the regular budget of the agency that pulls contributions from several donors should blur its donor-specific content. Second, we consider that individual donor countries have no control over the way the agency uses its regular budget. Multilateral organisations "allocate as they see fit within the limits prescribed by [their] mandate" (OECD, 2020c).

To test the validity of these two assumptions, 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. These descriptive facts are presented in Appendix B, Figure A.2. The graphs show that changes in migration rates that are attributable to destination-year variations are poorly correlated with multilateral aid per capita (while they are positively correlated with bilateral aid per capita).

Third, the identification strategy of the transmission channels relies on the assumption 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 recipient 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 & Dollar, 2000; Burnside & Dollar, 2000; Milner & Tingley, 2013; Schraeder *et al.*, 1998).

Nevertheless, the literature corroborates our assumption. In a comprehensive review of 45 empirical papers that test the effectiveness of bilateral and multilateral aid on various development outcomes, Biscaye *et al.* (2017) study why bilateral and multilateral aid may (or may not) have different levels of effectiveness. They conclude that there is no consistent evidence indicating that one type of aid is more effective than the other, which further supports our identification strategy. Furthermore, bilateral and multilateral aid are positively correlated at 28.4% (Table A.3). Therefore, the two types of aid are not perfectly concomitant.

4 Empirical results

4.1 Main findings

Benchmark results. The benchmark results of the IV strategy are reported in Table 2, columns (1) to (3). Column (3) shows the results of our baseline specification, which includes bilateral aid per capita received by country o from country d, as well as bilateral aid per capita received by country o from all donors except d. In addition, the regression incorporates the amount of multilateral aid per capita received by country o.

The results show that a 1% increase in bilateral aid from country d to country o induces a 0.55% increase in the reverse bilateral migration rate. In addition, a 1% increase in bilateral aid from all other donor countries induces a 0.12% decrease in the bilateral migration rate from country o to country d. These results are similar to the coefficients reported in columns (1) and (2) in which we include one variable at a time. Finally, multilateral aid has a positive and significant impact on the bilateral migration rate. A 1% increase in multilateral aid to country o induces a 0.02% increase in the bilateral migration rate from country o to country d.

The GDP ratio exhibits the expected sign. A higher income differential between the destination and origin countries increases the incentive to migrate, as observed in previous studies (Beine & Parsons, 2015; Vogler & Rotte, 2000). This finding is also consistent with the seminal model of Harris & Todaro (1970), suggesting that larger income gaps between origin and destination are associated with larger emigration.

For each specification, we report the F-statistic 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 predictor of the observed bilateral aid per capita. In addition, the first stage results show that, across all specifications, the instrumental variable is significantly and positively correlated with the endogenous variable of interest.

The results of the OLS regressions are reported in Table 2, columns (4) to (6). These results show that the estimates related to bilateral aid suffer from a downward bias. The bias could go in either direction, as reverse causality as well as potential omitted variable biases may be at play. On the one hand, controlling for reverse causality could help mitigate the positive feedback loop between aid and migration. On the other hand, the IV strategy should control 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 simultaneously reducing aid.

Quantification of the transmission channels. The estimation of the transmission channels is presented in the last panel of Table 2. IV-2SLS results are reported in column (3) and OLS results in column (6). We find evidence of a positive impact of aid on migration through the non-donor-specific channel, which is identified by the coefficient associated with multilateral aid per capita.[11]

Then, we find a positive and highly significant coefficient associated with the effect specific to donor d. This result indicates that the information channel prevails (over the instrumentation channel, if any). A 1% increase in bilateral aid induces a 0.55% increase in the reverse bilateral migration rate. In technical terms, when a donor country increases its aid to a recipient country and the amount of multilateral aid received by that country decreases by the same amount, the bilateral migration rate from the recipient country to that particular donor country increases. This result implies that bilateral aid conveys information, which decreases the corresponding bilateral cost of migration, thereby increasing the reverse migration rate.

Finally, we find a negative and significant effect associated with the specific effect of other donors than d. The significant and negative effect specific to all donors but d points to an information effect, indicating that contributions from other donors than d steer individuals away from destination d (likely towards these other donors). This effect is in line with Murat (2020), who refers to it as a negative cross-donor spillover.

Heterogeneity across income levels. We investigate whether the impact of aid on migration may be conditioned by the level of development of the recipient country. Analysing the development

[11] Assuming that aid has a positive impact on the welfare of the receiving country, this result implies that the credit constraint channel dominates the development channel (if the latter is at play). On the contrary, assuming that aid has a negative impact on the welfare of the receiving country, this result implies that a drop in the utility of individuals in the origin country would dominate and incentivise them to migrate.

Table 2: Benchmark results

	ln $Mig_{od,t}$					
Regressions	(1)	(2)	(3)	(4)	(5)	(6)
ln $BILpc_{do,t-1}$	0.6187***	0.5659***	0.5529***	0.0514***	0.0514***	0.0575***
	(0.1580)	(0.1459)	(0.1447)	(0.0118)	(0.0118)	(0.0118)
ln $BILpc_{\Lambda o,t-1}$		-0.1144***	-0.1200***			-0.0838***
		(0.0231)	(0.0231)			(0.0188)
ln $MULTIpc_{o,t-1}$			0.0169***			0.0139***
			(0.0048)			(0.0044)
ln ($GDPpc_{d,t-1}/GDPpc_{o,t-1}$)	0.1041***	0.0815***	0.0809***	0.0794***	0.0794***	0.0655**
	(0.0293)	(0.0279)	(0.0273)	(0.0273)	(0.0273)	(0.0265)
Origin-destination FE	yes	yes	yes	yes	yes	yes
Destination-year FE	yes	yes	yes	yes	yes	yes
Observations	14,043	14,043	14,043	14,043	14,043	14,043
Estimator	IV-2SLS	IV-2SLS	IV-2SLS	OLS	OLS	OLS
1st stage	0.5189***	0.5370***	0.5399***			
	(0.0662)	(0.0655)	(0.0655)			
K-Paap F Stat.	61.429	67.215	67.927			
R-squared				0.9913	0.9913	0.9913
Transmission channels						
Non-donor-specific channel			0.0169***			0.0139***
			(0.0048)			(0.0044)
Channel specific to donor d			0.5455***			0.0426***
			$(0.1546)^b$			$(0.0117)^b$
Channel specific to all donors but d			-0.4427***			-0.3460***
			$(0.0908)^b$			$(0.0682)^b$

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.

conditionality takes 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 & Naiditch, 2020). Although heterogeneity in the set of reachable destinations could be controlled for using origin-year fixed effects (Beine *et al.*, 2015), our baseline model does not allow the inclusion of 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 & Thiele (2018b).

Results are reported in Table 3, columns (1) and (2). We find that bilateral aid per capita from country d to country o has a significant and positive impact on reverse migration rates for both groups of countries. The rest of aid per capita has a negative and significant impact for both groups of countries, yet the effect is smaller for the richer countries. Finally, multilateral aid has a positive and significant impact for the richer countries only (column 2), while it has a weak effect for the poorest countries (column 1). Regarding the transmission channels, the coefficient associated with multilateral aid indicates the prevalence of a positive non-donor specific effect only for the richer origin countries. The information channel specific to donor d prevails only for the poorest origin countries. On the other hand, the channel specific to all donors but d is negative for both sets of origin countries.

The weakly significant non-donor effect for poorer origin countries reinforces the notion that aid might not substantially contribute to the welfare of the recipient country to impact migration. This contradicts the assumption in the literature that aid reduces migration by fostering growth in recipient countries, which would primarily impact individuals with lower incomes. Instead, our results are in line with (Clemens & Postel, 2018), providing a critical discussion of the assumption and concluding that the existing literature lacks strong evidence that aid systematically deters migration.

Table 3: Heterogeneity across income levels

	ln $\text{Mig}_{od,t}$	
Regressions	(1)	(2)
ln $\text{BILpc}_{do,t-1}$	0.5278***	0.6551**
	(0.2014)	(0.2786)
ln $\text{BILpc}_{\Lambda o,t-1}$	-0.1774***	-0.0830***
	(0.0446)	(0.0246)
ln $\text{MULTIpc}_{o,t-1}$	0.0171*	0.0188***
	(0.0098)	(0.0060)
ln ($\text{GDPpc}_{d,t-1}/\text{GDPpc}_{o,t-1}$)	0.0437	0.1486***
	(0.0356)	(0.0495)
Origin-destination FE	yes	yes
Destination-year FE	yes	yes
Observations	7,654	6,382
Sample	below med.	above med.
Estimator	IV-2SLS	IV-2SLS
1st stage	0.5493***	0.4551***
	(0.0802)	(0.1089)
K-Paap F Stat.	46.936	17.472
Transmission channels		
Non-donor-specific channel	0.0171*	0.0188***
	(0.0098)	(0.0060)
Channel specific to donor d	0.5183***	0.6493
	$(0.1925)^b$	$(0.5690)^b$
Channel specific to all donors but d	-0.4855**	-0.4540**
	$(0.1978)^b$	$(0.1786)^b$

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.

4.2 Robustness tests

We proceed to investigate the validity of the instrumentation strategy and present a number of robustness tests. The results are summarised in Table 4 and corroborate the baseline findings. Detailed results are presented in Appendix C, Tables A.5 to A.10.

Validity of the instrumentation strategy. We further assess the validity of the instrumentation strategy following Temple & Van de Sijpe (2017).[12] We replicate the baseline model on a set of sub-samples. Doing so, we exclude countries likely to steer the instrument in the wrong direction, by dominating either shifts or weights used in Equation (5).

First, we exclude specialised donor countries that provide aid to a small set of countries. More precisely, we exclude donors that give aid to less than 27 countries, which accounts for 10% of the sample. Second, we exclude specialised recipient countries that receive aid from a small set of donors. We exclude countries that receive aid from less than 6 donors, which excludes 10% of the sample. Third, we exclude countries with a population lower than 500,000 inhabitants at the beginning of the period.[13]

Results are reported in Table A.5 and are in line with the benchmark findings. For each sub-sample, the instrument remains strong and the first-stage coefficient remains positive and significant. We find consistent evidence that bilateral aid per capita and multilateral aid per capita have a positive impact on migration.

Alternative specifications. We test the validity of the baseline specification in Table A.6. First, we address the threat to identification caused by the presence of multilateral resistance to migration (Bertoli & Fernández-Huertas Moraga, 2013; Marchal & Naiditch, 2020). In column (1), we use an alternative set of fixed effects. We include origin-year fixed effects together with destination-year fixed effects to better control for unobserved time-varying characteristics of both the origin and the destination country, and for multilateral resistance to migration. Due to the intensive nature of this set of fixed effects, we drop the dyadic fixed effect from the regression.[14] Doing so, we no longer include multilateral aid per capita nor the GDP ratio since these variables vary within the dimensions of this alternative set of fixed effects.

In column (2), we additionally control for a set of dyadic variables commonly used in the literature.[15] More precisely, we include the (log) distance in kilometres between the capital cities of countries o and d (denoted $\ln \text{Dist}_{od}$), a dummy variable equal to one if the two countries share a common official language and zero otherwise (denoted Lang_{od}), and a dummy variable equal to one if the two countries share a common border and zero otherwise (denoted Contig_{od}). In addition, we include the (log) bilateral stock of migrants from the previous decade (denoted $\ln \text{Migstock}_{od}$).

[12] While we use the instrument for the same explanatory variable, we apply it to a specification with migration as the dependent variable. As emphasised by Bazzi & Clemens (2013), one needs to carefully examine the context from which the instrument has been derived. Therefore, we follow Temple & Van de Sijpe (2017) in addressing possible threats when applying this instrument.

[13] Using the same threshold as Temple & Van de Sijpe (2017), we exclude Antigua and Barbuda, Belize, Cape Verde, Dominica, Grenada, Kiribati, Maldives, Marshall Islands, Micronesia, Nauru, Palau, Samoa, Sao Tome and Principe, Seychelles, St Kitts and Nevis, St Lucia, St Vincent and the Grenadines, Tonga, Tuvalu, and Vanuatu.

[14] A 3-way fixed effect model would offer more econometric accuracy. However, there are two challenges in implementing this approach. First, we need a coefficient to identify the impact of multilateral aid in order to disentangle the non-donor- from the donor-specific effects of aid on migration. Unfortunately, since multilateral aid is origin-year specific, we are unable to include origin-year fixed effects in the baseline econometric model. Second, the level of disaggregation of our data is not sufficient to support the implementation of a 3-way fixed effect model.

[15] Dyadic controls are taken from the GeoDist database developed by the CEPII, which contains variables related to the geographical, cultural and linguistic distances between countries (Mayer & Zignago, 2011). We also use bilateral migration stocks from the Global Bilateral Migration database of the World Bank.

In columns (1) and (2), we find that bilateral aid per capita remains positive and significant, with the same magnitude as observed in the benchmark specification. However, the sign of the rest of aid per capita received by country o is sensitive to this change of fixed effect and becomes positive and significant. This can be explained by the fact that the only remaining variation in the data is the origin-destination(-year) dimension, so that multilateral resistance to migration is better controlled for in a specification with destination-year and origin-year fixed effects. In column (2), the covariates exhibit the expected signs: a larger distance between the origin and destination countries decreases migration rates, while a common language, a common border and a larger diaspora increase migration rates.

Second, we cluster errors within the origin (column 3) and the origin-destination dimensions (column 4) to account for unobserved factors that could be correlated with migration decisions from an origin country, and migration decisions between an origin and a destination country. We find that clustering errors within these alternative dimensions barely alters the significance of the transmission channels.

Alternative aid variables. We study the potential discrepancy between aid disbursements (used in the benchmark estimations) and aid commitments in Table A.7. The OECD-DAC Creditor Reporting System database contains both disbursement and commitment 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 disbursements or commitments in the empirical analysis is thus an important one, especially because there is still some debate among economists (Bulíř & Hamann, 2008; Hudson, 2013; Tierney *et al.*, 2011).

In column (1), we use aid commitments instrumented using predicted aid commitments. The effect of bilateral aid per capita is positive and significant, while the impact of multilateral aid per capita is insignificant. This could be due to the fact that the development and financial constraint channels may not materialise when considering commitments, at least in the short run. In fact, commitments seem to materialise only after 5 years, as shown by another robustness test presented below (see Table A.9).

Finally, the aid-migration literature relies on different constructions of the aid variable. We have reviewed empirical studies in Table A.1. Some papers use aid flows (Azam & Berlinschi, 2009; Berthélemy *et al.*, 2009; Fitchett & Wesselbaum, 2022; Menard & Gary, 2020; Moullan, 2013; Mughanda, 2011; Murat, 2020; Ontiveros & Verardi, 2012), while other scholars refer to aid per capita (Lanati & Thiele, 2018b,a, 2020b,a), and yet others refer to aid as a share of the recipient country's GDP (Dreher *et al.*, 2019; Gamso & Yuldashev, 2018a,b). In column (2), we use the share of bilateral aid relative to the GDP of the recipient country. The results remain in line with the benchmark model.

Other threats to identification. We now investigate an additional threat to identification, that concerns the omission of trade in the econometric model. The relationship between migration and trade is a major topic in the literature on migration (see Parsons & Winters, 2014, for a survey of the literature). For instance, preferential trade agreements can crowd out migrants from nonmember countries, also referred to as migration deflection effects (Beverelli & Orefice, 2019). In addition, trade may also correlate with aid (see e.g., Menard & Gary 2020 and Suwa-Eisenmann & Verdier 2007 for an overview). For instance, donors may allocate aid based on economic interests, directing more aid towards trade partners (see e.g., Berthélemy, 2006). Therefore, the observed impact of aid may be driven by trade rather than aid itself.

We follow Dreher *et al.* (2019) and Lanati & Thiele (2018b) and conduct two robustness checks that consist in controlling for trade. Results are presented in Table A.8, columns (1) and (2). We perform a first test in which we add a time-varying dyadic variable equal to one when the two countries are part of the same regional trade agreement in a given year (denoted $\text{RTA}_{od,t-1}$). In a second test, we add the bilateral trade flow observed between the two countries in a given year (denoted $\text{Tradeflow}_{od,t-1}$).[16] The coefficient associated with regional trade agreements is positive in column (1), while the coefficient associated with bilateral trade flows is insignificant in column (2). Nonetheless, both specifications provide results for aid that are very close to the baseline specification, showing that omitting the relationship between trade and migration poses no major threat to identification.

Furthermore, we discuss the inclusion of the GDP ratio in the baseline specification. The fact that the GDP ratio has the same sign as the coefficient associated with multilateral aid per capita indicates that the two effects go in the same direction (see Table 2, column 3). The GDP ratio could, however, be a confounding factor of the non-donor specific channel captured by multilateral aid.

To test the robustness of this result, we drop the GDP ratio from the econometric model. Results are reported in Table A.8, column (3). This change of specification has virtually no effect on the sign and magnitude of the coefficients. In column (4), we use the GDP per capita of country o instead of the GDP ratio, (see e.g., Dreher *et al.*, 2019; Lanati & Thiele, 2020a, for a similar specification). As the model includes destination-year fixed effects, the GDP per capita of country d does not need to be included separately. Once again, this alternative specification has no effect on the sign and magnitude of the coefficients. While the GDP per capita of country o has the same magnitude as in column (3) because of the inclusion of destination-year fixed effects, its sign is negative in column (4). This result suggests that a budget constraint effect is at play in the origin countries. When the income per capita increases in country o, individuals have more financial means to migrate.

Long-term effects. In the baseline specification, we follow the literature and assume that an increase in aid per capita impacts migration decisions in the next year. In particular, the literature on migration intentions using the Gallup World Poll measures migration intentions as individuals planning to leave their country within one year (Bertoli & Ruyssen, 2018). We, therefore, use a one-year lag of aid per capita which seems reasonable to study the effect of aid disbursements on migration decisions. However, the impact of aid on the welfare of the recipient country may take time to materialise. As a result, the decision to migrate may not follow immediately.

Therefore, we test for a long-term impact of aid on migration. The results are reported in Table A.9. We consider a 3-year lag in column (1), and a 5-year lag in column (2). We find that bilateral aid per capita as well as multilateral aid per capita no longer have a significant effect on migration. However, the effect of bilateral aid per capita received by country o from other donors than d remains negative and highly significant with a three-year lag (column 1), but the

[16] These two variables are taken from the Gravity database developed by the CEPII (Head *et al.*, 2010).

significance of the coefficient diminishes with a five-year lag (column 2). This set of results suggests that the effect of disbursements aid on migration are at play in the short-term.

We replicate this exercise using aid commitments in columns (3) and (4), since aid commitments may take some time before materialising in the budget of the recipient country. The discrepancy between aid disbursements and commitments partly comes from the recipient countrys ability to receive the funds, for instance on its administrative capacity or its political context (Moullan, 2013; Berthélemy, 2006). The coefficients associated with bilateral aid commitments and the rest of bilateral aid commitments are in line with the baseline findings when using a three-year lag (column 3), while this is not the case using a five-year lag (column 4). On the contrary, the effect of multilateral aid commitments is only positive and significant after five years. These results suggest that aid commitments do take time to materialise, even more so when aid is conveyed through the regular budget of multilateral organisations.

Placebo test. Lastly, we perform a placebo test to further assess the validity of the identification strategy that consists in using multilateral aid per capita. As discussed before, this variable is presumably *cleaned* from donor-specific effects as it emanates from the regular budget of multilateral agencies. We have excluded non-core contributions, also referred to as *earmarked* or *multi-bi* funding, which represent resources channelled through multilateral organisations that allow donors to retain control over their funds. To test the validity of the baseline findings, we replace multilateral aid (consisting of core contributions) by a variable capturing multilateral aid made of non-core contributions (denoted by $\text{MULTI}\mathbf{BI}\text{pc}_{o,t-1}$). This alternative variable should encompass non-donor-specific as well as donor-specific effects of multilateral aid.

Results are reported in Table A.10. IV-2SLS results are reported in column (1) and OLS results are presented in column (2). The effects associated with bilateral aid per capita and the rest of bilateral aid per capita are in line with the baseline findings, while the effect of multilateral is no longer significant. This suggest that core and non-core contributions are not concomitant and encompass different effects. It also supports the validity of our identification strategy that relies on estimating the effect of multilateral aid on migration, assuming that the recipient country has likely no information on the origin of multilateral aid.

Table 4: Summary of the results

Model			Average effects of bilateral aid		Transmission channels		
Specification	Estimator	Table (col)	ln $\text{BILpc}_{do,t-1}$	ln $\text{BILpc}_{\Lambda o,t-1}$	non-donor (ln $\text{MULTIpc}_{o,t-1}$)	specific to donor d	specific to all donors but d
Main findings							
Benchmark results	IV-2SLS	2 (3)	0.5529***	-0.1200***	0.0169***	0.5455***	-0.4427***
Benchmark results	OLS	2 (6)	0.0575***	-0.0838***	0.0139***	0.0426***	-0.3460***
Heterogeneity - GDP per capita $<$ median	IV-2SLS	3 (1)	0.5278***	-0.1774***	0.0171*	0.5183***	-0.4855**
Heterogeneity - GDP per capita $>$ median	IV-2SLS	3 (2)	0.6551**	-0.0830***	0.0188***	0.6493	-0.4540**
Robustness tests							
Excluding specialised donors	IV-2SLS	A.5 (1)	0.5140***	-0.1156***	0.0165***	0.5072**	-0.4303***
Excluding specialised recipients	IV-2SLS	A.5 (2)	0.6034***	-0.1423***	0.0200***	0.5940***	-0.5524***
Excluding small population countries	IV-2SLS	A.5 (3)	0.5529***	-0.1200***	0.0169***	0.5456***	-0.4428***
Alternative fixed effects	IV-2SLS	A.6 (1)	1.0532***	1.2867***			
Alternative fixed effects with dyadic controls	IV-2SLS	A.6 (2)	0.5005***	1.1099***			
Origin cluster	IV-2SLS	A.6 (3)	0.5529**	-0.1200***	0.0169**	0.5456***	-0.4428***
Origin-destination cluster	IV-2SLS	A.6 (4)	0.5005***	1.1099***	0.0169***	0.5456***	-0.4428***
Aid commitments	IV-2SLS	A.7 (1)	0.6317***	-0.0721**	-0.0003	0.6319***	-0.0647
Share of aid as % of GDP	IV-2SLS	A.7 (3)	0.3032***	-0.0978***	0.0274***	0.2591***	-0.5882***
Including RTAs	IV-2SLS	A.8 (1)	0.5442***	-0.1204***	0.0156***	0.5374***	-0.4181***
Including bilateral trade flows	IV-2SLS	A.8 (2)	0.6458***	-0.1469***	0.0203***	0.6368***	-0.5264***
Dropping the GDP ratio	IV-2SLS	A.8 (3)	0.5269***	-0.1256***	0.0168***	0.5195***	-0.4468***
Including the GDP per capita of country o	IV-2SLS	A.8 (4)	0.5529***	-0.1200***	0.0169***	0.5455***	-0.4428***
3-year lag	IV-2SLS	A.9 (1)	0.2719	-0.0795***	0.0046	0.2699	-0.1723
5-year lag	IV-2SLS	A.9 (2)	0.3856	-0.0367	0.0113	0.3810	-0.2490
3-year lag - aid commitments	IV-2SLS	A.9 (3)	0.5103***	-0.0650**	0.0025	0.5087***	-0.1176
5-year lag - aid commitments	IV-2SLS	A.9 (4)	0.3708	0.0142	0.0230***	0.3560	-0.4704***
Placebo test	IV-2SLS	A.10 (1)	0.5792***	-0.1141***	-0.0136	0.5884***	0.2917
Placebo test	OLS	A.10 (2)	0.0569***	-0.0781***	-0.0030	0.0620***	0.0113

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

5 Conclusions

This article revisited the aid-migration nexus, with the aim of quantifying the donor- and non-donor-specific transmission channels. We found strong evidence that both bilateral and multilateral aid per capita have a positive effect on the reverse migration rate. 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 of a positive non-donor-specific effect driven by the richer aid recipient countries. These findings are in line with research showing a limited impact of aid on growth in the poorest recipient countries (Burnside & Dollar, 2000; Clemens *et al.*, 2012; Doucouliagos & Paldam, 2011): if aid has little impact on living standards in these countries, it is very unlikely that the development channel is large enough to incentivise people to stay, as evidenced by Clemens & Postel (2018) in their survey of the literature.

From a policy perspective, our findings suggest that using foreign aid as a policy tool to reduce migration is rather inefficient. When providing bilateral development aid, donor countries reveal information about themselves, which enhances their attractiveness. While shifting aid to multilateral agencies reduces this information channel, migration is unlikely to decrease unless the root causes of migration are tackled more effectively. Therefore, accompanying efforts addressing migration from developing countries are deemed important.

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Online resource: appendix

A Survey of the empirical literature

Table A.1: Empirical studies on the aid-migration nexus

Study	Causality	Period	Origin (recipient)	Destination (donor)	Migration data	Aid data	Aid type	Endogeneity	Total aid	Bilateral 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, aid flows	Additional controls	-		Inst.
Berthélemy et al. (2009)	Aid → Mig.	2000	187 c.	22 OECD c.	World Bank	OECD	Disbursements, aid flows	System of equations	+	+	Cred. Info.
Dreher et al. (2019)	Aid → Refugees	1976-2013	141 c.	28 OECD c.	UNHCR	OECD	Disbursements, aid sh. of GDP	IVs	-	+/-	Dev. Info. Inst.
Fitchett & Wesselbaum (2022)	Aid → Mig.	1980-2015	198 c.	16 c.	United Nations & OECD	OECD	Disbursements, aid flows	IVs		+	Cred.
Gamso & Yuldashev (2018a)	Aid → Mig.	1995-2010	103 c.	20 OECD c.	IAB	AidData	Commitments, aid sh. of GDP	IVs, PSM		0/-	Dev.
Gamso & Yuldashev (2018b)	Aid → Mig.	1985-2010	101 c.	20 OECD c.	IAB	AidData	Commitments, aid sh. of GDP	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, aid per capita	System of equations	-	+	Dev.
Lanati & Thiele (2018b)	Aid → Mig.	1995-2014	141 c.	26 OECD c.	OECD	OECD	Disbursements, aid per capita	System of equations	-	+	Cred. Dev. Info.
Lanati & Thiele (2020a)	Aid → Mig.	2009-2016	125 c.	OECD	OECD	OECD	Disbursements, aid per capita	Two-step approach	-		Dev.
Lanati & Thiele (2020b)	Aid → Int. Student Flows	2008-2015	120 c.	17 OECD c.	UIS UNESCO	OECD	Disbursements, aid per capita	Two-step approach	-		Dev.
Menard & Gary (2020)	Aid → Mig.	2000-2010	153 c.	22 OECD c.	OECD	OECD	Disbursements, aid flows	System of equations		+	Info.
Moullan (2013)	Aid → Physician Mig.	1998-2004	192 c.	16 OECD c. & South Africa	Bhargava & Docquier (2007)	OECD	Commitments, aid flows	GMM	-		Dev.
Mughanda (2011)	Aid → Mig.	2004	Sub-Saharan c.	OECD	United Nations	OECD	Not mentioned, aid flows		+		Cred.
Murat (2020)	Aid → Asylum applications	1993-2013	113 c.	14 OECD c.	UNHCR	OECD	Disbursements, aid flows	IVs, system GMM		+/-	Cred. Dev.
Ontiveros & Verardi (2012)	Aid → Mig.	1975-2000	195 c.	6 developed c.	Defoort & Rogers (2008)	OECD	Disbursements, aid flows	IVs, system GMM	+		Cred. Info.

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

B Descriptive statistics

Table A.2: Summary statistics

Variable	**Mean**	**Std. Dev.**	**Min.**	**Max.**	**Obs.**
Migration					
Bilateral migration rate	0.016	0.080	2.49e-07	1.575	14,043
Foreign aid					
Bilateral aid (millions USD)	32.056	131.597	4.04e-04	4,030.866	14,043
Rest of bilateral aid (millions USD)	1,744.453	2,176.57	1.058	15,948.398	14,043
Total bilateral aid (millions USD)	1,776.509	2,205.993	1.101	15,948.575	14,043
Multilateral aid (millions USD)	73.061	145.465	0	1,717.139	14,043
Bilateral aid per capita (USD)	5.699	52.075	2.70e-07	2,433.565	14,043
Rest of bilateral aid per capita (USD)	109.140	199.403	0.807	4,416.295	14,043
Total bilateral aid per capita (USD)	114.839	228.373	1.805	4,619.992	14,043
Multilateral aid per capita (USD)	6.535	20.734	0	414.432	14.043
Control variables					
GDP per capita at origin (thousands USD)	3.975	3.589	0.226	22.405	13,905
GDP per capita at destination (thousands USD)	47.742	20.647	12.372	119.173	14,043
GDP at origin (millions USD)	437.626	1,098.61	0.035	9,560.219	13,722

Summary statistics for the main variables of interest over the period 2011-2019.

Table A.3: Correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)
(1) ln $\text{Mig}_{od,t}$	1					
(2) ln $\text{BILpc}_{do,t-1}$	0.523***	1				
(3) ln $\text{BILpc}_{\Lambda o,t-1}$	0.282***	0.357***	1			
(4) ln $\text{BILpc}_{o,t-1}$	0.309***	0.418***	0.996***	1		
(5) ln $\text{MULTIpc}_{o,t-1}$	0.215***	0.284***	0.513***	0.516***	1	
(6) ln $(\text{GDPpc}_{d,t-1}/\text{GDPpc}_{o,t-1})$	-0.219***	0.0171*	-0.124***	-0.122***	0.0426***	1

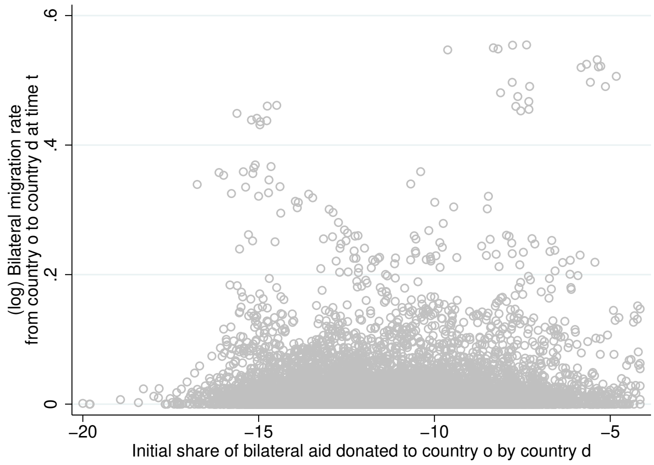
Correlation coefficients between the dependent and the explanatory variables used in the empirical analysis (see Equation 4). ***, ** and * denote significance at the 1%, 5% and 10% level respectively.

Table A.4: Testing the exclusion restriction assumption

Regressions	(1)	(2)	(3)
	$\Delta \mathrm{IV}_{do,2013:2019}$	$\Delta \mathrm{IV}_{do,2014:2019}$	$\Delta \mathrm{IV}_{do,2015:2019}$
$\Delta \mathrm{Mig}_{od,2011:2012}$	-0.0114		
	(0.0229)		
	[1,451]		
$\Delta \mathrm{Mig}_{od,2011:2013}$		-0.0040	
		(0.0076)	
		[1,443]	
$\Delta \mathrm{Mig}_{od,2011:2014}$			0.0000
			(0.0048)
			[1,427]

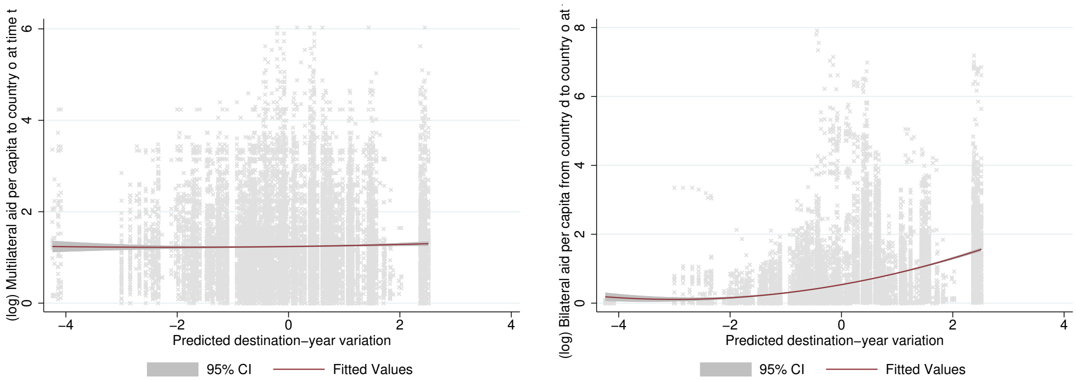
Coefficients obtained from OLS regressions with origin and destination fixed effects. Standard errors are reported in parentheses. The number of observations is reported in brackets.

Figure A.1: Initial shares of aid and bilateral migration rates



Relationship between the initial shares of aid allocated to a recipient country by a donor country ($\mathrm{Aid}_{do,t_0}/\mathrm{Aid}_{d,t_0}$, see equation 5), and the corresponding bilateral migration rate.

Figure A.2: Destination-year variations in migration and foreign aid



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

C Robustness tests

Table A.5: Validity of the instrumentation strategy

	ln $\text{Mig}_{od,t}$		
Regressions	(1)	(2)	(3)
ln $\text{BILpc}_{do,t-1}$	0.5140***	0.6034***	0.5529***
	(0.1661)	(0.1479)	(0.1447)
ln $\text{BILpc}_{\Lambda o,t-1}$	-0.1156***	-0.1423***	-0.1200***
	(0.0236)	(0.0260)	(0.0231)
ln $\text{MULTIpc}_{o,t-1}$	0.0165***	0.0200***	0.0169***
	(0.0048)	(0.0057)	(0.0048)
ln ($\text{GDPpc}_{d,t-1}/\text{GDPpc}_{o,t-1}$)	0.0834***	0.0779***	0.0809***
	(0.0275)	(0.0280)	(0.0273)
Origin-destination FE	yes	yes	yes
Destination-year FE	yes	yes	yes
Observations	13,488	13,432	14,043
Estimator	IV-2SLS	IV-2SLS	IV-2SLS
1st stage	0.4840***	0.5875***	0.5399***
	(0.0719)	(0.0676)	(0.0655)
K-Paap F Stat.	45.376	75.445	67.927
Transmission channels			
Non-donor-specific channel	0.0165***	0.0200***	0.0169***
	(0.0048)	(0.0057)	(0.0048)
Channel specific to donor d	0.5072**	0.5940***	0.5456***
	$(0.2105)^b$	$(0.1515)^b$	$(0.1448)^b$
Channel specific to all donors but d	-0.4303***	-0.5524***	-0.4428***
	$(0.1155)^b$	$(0.1108)^b$	$(0.0967)^b$

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) excludes specialised donor countries that give aid to less than 27 countries. The sample used in column (2) excludes specialised recipient countries that receive aid from less than 6 donors. The sample used in column (3) excludes countries with a population lower than 500,000 inhabitants at the beginning of the period.

Table A.6: Alternative specifications

	ln $\text{Mig}_{od,t}$			
Regressions	(1)	(2)	(3)	(4)
ln $\text{BILpc}_{do,t-1}$	1.0532***	0.5005***	0.5529**	0.5529**
	(0.0346)	(0.0245)	(0.2655)	(0.2363)
ln $\text{BILpc}_{\Lambda o,t-1}$	1.2867***	1.1099***	-0.1200***	-0.1200***
	(0.2949)	(0.1584)	(0.0398)	(0.0298)
ln $\text{MULTIpc}_{o,t-1}$			0.0169**	0.0169***
			(0.0069)	(0.0062)
ln ($\text{GDPpc}_{d,t-1}$/$\text{GDPpc}_{o,t-1}$)			0.0809*	0.0809***
			(0.0456)	(0.0298)
ln Migstock_{od}		0.3924***		
		(0.0080)		
ln Dist_{od}		-0.6029***		
		(0.0250)		
Lang_{od}		0.7398***		
		(0.0354)		
Contig_{od}		0.2719**		
		(0.1057)		
Origin-destination FE	no	no	yes	yes
Destination-year FE	yes	yes	yes	yes
Origin-year FE	yes	yes	no	no
Error cluster	origin-year	origin-year	origin	origin-destination
Observations	14,038	13,212	14,043	14,043
Estimator	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS
1st stage	0.7460***	0.7625***	0.5370***	0.5370***
	(0.0165)	(0.0120)	(0.1131)	(0.1241)
K-Paap F Stat.	2,052.061	4,065.022	22.738	19.028
Transmission channels				
Non-donor-specific channel			0.0169**	0.0169***
			(0.0069)	(0.0062)
Channel specific to donor d			0.5456***	0.5456***
			(0.1546)	(0.1546)
Channel specific to all donors but d			-0.4428***	-0.4428***
			(0.0908)	(0.0908)

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.

Table A.7: Alternative aid variables

	ln $\text{Mig}_{od,t}$	
Regressions	(1)	(2)
ln $\text{BILpc}^{\text{com}}_{do,t-1}$	0.6317***	
	(0.1200)	
ln $\text{BILpc}^{\text{com}}_{\Lambda o,t-1}$	-0.0721**	
	(0.0305)	
ln $\text{MULTIpc}^{\text{com}}_{o,t-1}$	-0.0003	
	(0.0080)	
ln Sh. $\text{BIL}_{do,t-1}$		0.3032***
		(0.0617)
ln Sh. $\text{BIL}_{\Lambda o,t-1}$		-0.0978***
		(0.0218)
ln Sh. $\text{MULTI}_{o,t-1}$		0.0274***
		(0.0083)
ln ($\text{GDPpc}_{d,t-1}/\text{GDPpc}_{o,t-1}$)	0.0948***	0.0721***
	(0.0290)	(0.0270)
Origin-destination FE	yes	yes
Destination-year FE	yes	yes
Observations	14,043	13,806
Estimator	IV-2SLS	IV-2SLS
K-Paap F Stat.	111.802	340.113
1st stage	0.6212***	0.8900***
	(0.0588)	(0.0483)
Transmission channels		
Non-donor-specific channel	-0.0003	0.0274***
	(0.0080)	(0.0083)
Channel specific to donor d	0.6319***	0.2591***
	$(0.1176)^b$	$(0.0658)^b$
Channel specific to all donors but d	-0.0647	-0.5882***
	$(0.1542)^b$	$(0.1392)^b$

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 superscript *com* stands for aid commitments. In column (1), aid commitments are instrumented using predicted aid commitments. In column (2), we use the share of aid (the aid flows is divided by the gross GDP of country o).

Table A.8: Addressing other threats to identification

	$\ln \text{Mig}_{od,t}$			
Regressions	(1)	(2)	(3)	(4)
$\ln \text{BILpc}_{do,t-1}$	0.5442***	0.6458***	0.5269***	0.5529***
	(0.1430)	(0.1305)	(0.1424)	(0.1447)
$\ln \text{BILpc}_{\Lambda o,t-1}$	-0.1204***	-0.1469***	-0.1256***	-0.1200***
	(0.0229)	(0.0233)	(0.0226)	(0.0231)
$\ln \text{MULTIpc}_{o,t-1}$	0.0156***	0.0203***	0.0168***	0.0169***
	(0.0047)	(0.0050)	(0.0048)	(0.0048)
$\ln (\text{GDPpc}_{d,t-1}/\text{GDPpc}_{o,t-1})$	0.0821***	0.0736***		
	(0.0271)	(0.0277)		
$\text{RTA}_{od,t-1}$	0.0571***			
	(0.0191)			
$\text{Tradeflow}_{od,t-1}$		-0.0030		
		(0.0042)		
$\ln \text{GDPpc}_{o,t-1}$				-0.0809***
				(0.0273)
Origin-destination FE	yes	yes	yes	yes
Destination-year FE	yes	yes	yes	yes
Observations	14,043	13,216	14,043	14,043
Estimator	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS
K-Paap F Stat.	68.191	78.175	68.636	67.927
1st stage	0.5410***	0.5615***	0.5442***	0.5399***
	(0.0655)	(0.0635)	(0.0657)	(0.0655)
Transmission channels				
Non-donor-specific channel	0.0156***	0.0203***	0.0168***	0.0169***
	(0.0047)	(0.0050)	(0.0048)	(0.0048)
Channel specific to donor d	0.5374***	0.6368***	0.5195***	0.5455***
	$(0.1535)^b$	$(0.1404)^b$	$(0.1518)^b$	$(0.1546)^b$
Channel specific to all donors but d	-0.4181***	-0.5264***	-0.4468***	-0.4428***
	$(0.0909)^b$	$(0.1095)^b$	$(0.0891)^b$	$(0.0908)^b$

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.

Table A.9: Long-term effects

	$\ln \text{Mig}_{od,t}$			
Regressions	(1)	(2)	(3)	(4)
$\ln \text{BILpc}_{do,t-3}$	0.2719			
	(0.2233)			
$\ln \text{BILpc}_{\Lambda o,t-3}$	-0.0795***			
	(0.0262)			
$\ln \text{MULTIpc}_{o,t-3}$	0.0046			
	(0.0055)			
$\ln \text{BILpc}_{do,t-5}$		0.3856		
		(0.4210)		
$\ln \text{BILpc}_{\Lambda o,t-5}$		-0.0367		
		(0.0318)		
$\ln \text{MULTIpc}_{o,t-5}$		0.0113		
		(0.0083)		
$\ln \text{BILpc}^{\text{com}}_{do,t-3}$			0.5103***	
			(0.1489)	
$\ln \text{BILpc}^{\text{com}}_{\Lambda o,t-3}$			-0.0650**	
			(0.0310)	
$\ln \text{MULTIpc}^{\text{com}}_{o,t-3}$			0.0025	
			(0.0078)	
$\ln \text{BILpc}^{\text{com}}_{do,t-5}$				0.3708
				(0.2449)
$\ln \text{BILpc}^{\text{com}}_{\Lambda o,t-5}$				0.0142
				(0.0396)
$\ln \text{MULTIpc}^{\text{com}}_{o,t-5}$				0.0230***
				(0.0073)
$\ln (\text{GDPpc}_{d,t-1}/\text{GDPpc}_{o,t-1})$	0.0280	0.0063	0.0424	0.0113
	(0.0292)	(0.0304)	(0.0281)	(0.0290)
Origin-destination FE	yes	yes	yes	yes
Destination-year FE	yes	yes	yes	yes
Observations	9,659	6,051	9,659	6,051
Estimator	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS
K-Paap F Stat.	12.512	2.542	42.956	10.783
1st stage	0.3361***	0.2365	0.4995***	0.4501***
	(0.0950)	(0.1483)	(0.0762)	(0.1371)
Transmission channels				
Non-donor-specific channel	0.0046	0.0113	0.0025	0.0230***
	(0.0055)	(0.0083)	(0.0078)	(0.0073)
Channel specific to donor d	0.2699	0.3810	0.5087***	0.3560
	(0.3994)	(7.7707)	(0.1837)	(0.4371)
Channel specific to all donors but d	-0.1723	-0.2490	-0.1176	-0.4704***
	(0.1139)	(1.9397)	(0.1692)	(0.1740)

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 superscript *com* stands for aid commitments. In columns (1) and (2) report regressions using aid disbursements, and columns (3) and (4) report regressions using aid commitments.

Table A.10: Placebo test

	ln $\text{Mig}_{od,t}$	
Regressions	(1)	(2)
ln $\text{BILpc}_{do,t-1}$	0.5792***	0.0569***
	(0.1489)	(0.0118)
ln $\text{BILpc}_{\Lambda o,t-1}$	-0.1141***	-0.0781***
	(0.0231)	(0.0189)
ln $\text{MULTI}\mathbf{BI}\text{pc}_{o,t-1}$	-0.0136	-0.0030
	(0.0095)	(0.0081)
ln $(\text{GDPpc}_{d,t-1}/\text{GDPpc}_{o,t-1})$	0.0860***	0.0666**
	(0.0283)	(0.0272)
Origin-destination FE	yes	yes
Destination-year FE	yes	yes
Observations	14,043	14,043
Estimator	IV-2SLS	OLS
1st stage	0.5283***	
	(0.0652)	
K-Paap F Stat.	65.568	
R-squared		0.9913
Transmission channels		
Non-donor-specific channel	-0.0136	-0.0030
	(0.0095)	(0.0081)
Channel specific to donor d	0.5884***	0.0620***
	(0.1625)	(0.0162)
Channel specific to all donors but d	0.2917	0.0113
	(0.3079)	(0.1947)

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.

Online resource: replication material

Section D describes the procedure one should follow in order to download the replication material and replicate the results of the paper. Section E provides additional information on how the data provided by the authors in this replication material have been obtained.

D How to?

To download the replication material and replicate the results of the paper, please follow these steps:

- Download the folder `MNS_replication_material.zip` here.
- Unzip it in your working directory.
- Data that are freely available are provided by the authors in folder `./MNS_replication_material/sources`. Data from the CEPII are not provided by the authors. These dataset are freely available after registration on the CEPII website by the user. Download these datasets as follows:
  - GeoDist
    - Register and download the data here.
    - File to be downloaded: `dist_cepii.dta`
    - Save `dist_cepii.dta` in folder: `./MNS_replication_material/sources/CEPII`
  - Gravity
    - Register and download the data here.
    - File to be downloaded: `Gravity_dta_V202102.zip`
    - Save `Gravity_dta_V202102.zip` and extract in folder: `./MNS_replication_material/sources/CEPII/Gravity_dta_V202102`
- Open `./MNS_replication_material/dofiles/main.do` using Stata MP 15.0 for Ubuntu.
- Line 16, replace `Z:/temp/` by your working directory.
- Execute `./MNS_replication_material/dofiles/main.do`

E Additional information on the data sources

This section describes how the data provided by the authors in the replication material have been obtained by the authors.

GeoDist

- Reference document: **Mayer, T. and S. Zignago**, Notes on CEPII's distances measures: the GeoDist Database, Working Paper 2011-25, CEPII 2011.
- Data producer: Centre d'Études Prospectives et d'Informations Internationales
- Availability: freely available after registration here.
- Data not provided by the authors.

Global Bilateral Migration

- Data producer: The World Bank
- Availability: freely available here.
- Data selection:
  - Database: select "Global Bilateral Migration"
  - Country Origin: select all
  - Country Dest: select all
  - Migration by Gender: select "Total"
  - Year: select all
  - Download option: csv
- Data provided by the authors in folder: `./MNS_replication_material/sources/WB/GBM`

Gravity

- Reference document: **Head, K., T. Mayer, and J. Ries**, The erosion of colonial trade linkages after independence, *Journal of International Economics*, 2010, 81(1), 1-14.
- Data producer: Centre d'Études Prospectives et d'Informations Internationales
- Availability: freely available after registration here.
- Data not provided by the authors.

OECD International Migration Database - Flows

- Data producer: OECD
- Availability: freely available here.
- Data provided by the authors in folder: `./MNS_replication_material/sources/OECD_International_Migration_Database`

OECD-DAC database (Creditor Reporting System)

- Data producer: OECD
- Availability: freely available here.
- Data provided by the authors in folder: `./MNS_replication_material/sources/OECD_DAC`

World Development Indicators

- Data producer: The World Bank
- Availability: freely available here.
- Data selection:
  - Database: select "World Development Indicators"
  - Country: select all
  - Series: select "Population, total"
  - Time: select all
  - Layout>Custom: Time=Row, Series=Column, Country=Page
  - Download option: csv
- Data provided by the authors in folder: `./MNS_replication_material/sources/WB/WDI`