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Abstract

To assess the impact of aid on bilateral migration, we build a RUM model of migration from which we derive a gravity model. We estimate this model using an IV-2SLS strategy and the DEMIG-C2C and AidData datasets from 1973 to 2010. We find that aid from a donor country to a recipient country has a positive impact on the reverse migration rate. Introducing multilateral aid in the model, we find strong evidence that an information channel is at play and larger for the poorest countries. Finally, we only find weak evidence that a development channel is a play.

Key words - Aid, Gravity, Migration, RUM model
JEL classification - F14, F22, J61, O15

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1 Introduction

The increased immigration pressure faced by developed countries has led policy-makers to find ways to contain migration, especially from developing countries. Among several policy tools, development 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 alternative is sometimes seen by policymakers 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 development aid: addressing "the root causes [of migration] through development cooperation and humanitarian assistance" and implementing "stronger action to link migration and development policy"[1]. Yet, the efficiency of such policies is unclear and there is no consensus in the literature regarding the impact of development aid on migration flows. This paper intends to analyse thoroughly the impact of aid on migration and the transmission channels through which aid impacts migration.

Four main channels through which aid may impact international migration have been identified so far: two channels that are non-donor-specific, and two channels that are specific to the donor country. The non-donor-specific channels encompass the way aid may impact bilateral migration whatever the aid donor, while donor-specific channels relate to the way bilateral aid may impact bilateral migration depending on the donor country. Let us start by mentioning the non-donor-specific channels: First, aid may reduce migration flows through a *development channel* (Berthélemy et al., 2009; Dreher et al., 2019; Gamso and Yuldashev, 2018a,b; Lanati and Thiele, 2018a,b; Morrison, 1982; Moullan, 2013; Murat, 2020). If aid increases disposable income in the origin country, then it may reduce the income gap between the origin country and potential destinations which in turn may reduce incentives to migrate. Second, aid may foster migration through a *credit constraint channel* (Angelucci, 2015; Berthélemy et al., 2009; Dreher et al., 2019; Faini and Venturini, 1993; Lanati and Thiele, 2018a,b; Morrison, 1982; Mughanda, 2011; Murat, 2020; Ugarte Ontiveros and Verardi, 2012). If aid provides individuals who wish to emigrate with the financial means to do so – thereby lowering their credit constraints – then aid may increase their ability to migrate. The two donor-specific channels are the following: First, aid may increase migration through an *information channel* (Berthélemy et al., 2009; Lanati and Thiele, 2018b; Morrison, 1982; Ugarte Ontiveros and Verardi, 2012). If bilateral aid provides the population of the recipient country with information on the donor country, then it may decrease the costs of migration to that particular country. Second, the effect of aid may be channelled through an *instrumentation channel* (Azam and Berlinschi, 2009). If a donor country uses bilateral aid strategically in order to influence the emigration policy of the recipient country, then aid may have a negative impact on migration.

[1]A European Agenda on Migration, The European Commission, Brussels, 13.5.2015, `https://ec.europa.eu/home-affairs/what-we-do/policies/european-agenda-migration_en`

Existing empirical evidence is rather mixed. While some studies find evidence that aid reduces emigration and conclude that a development effect prevails, other studies find evidence that aid lowers the migration costs and the credit constraints of would-be migrants, which increases total emigration as well as emigration to the donor country. Overall, the question of whether aid effectively decreases migration and especially through which channels remains unclear.

This tension in the literature may be explained by the absence of a well-suited theoretical framework to analyse these channels. Existing studies generally attribute the impact of total bilateral aid – the sum of bilateral aid flows across all donor countries to a recipient country – to a non-donor-specific effect (development and credit constraint channels) and the impact of bilateral aid to a donor-specific effect (information and instrumentation channels). The identification of these effects yet suffers from the following caveats: just as individual bilateral aid flows, the sum of bilateral aid flows may include non-donor-specific as well as donor-specific effects. First, the development and credit constraint channels identified in the literature are not cleaned from donor-specific effects (information and instrumentation channels) because total bilateral aid also provides information on the donor countries. For instance, a decrease in migration following an increase in total bilateral aid may be driven by reallocation effects across destination countries due to a change in the composition of information received by individuals. Second, the information and instrumentation channels identified in the literature are not cleaned from non-donor-specific effects (development and credit constraint channels). For instance, we cannot exclude that aid from a specific donor country may also participate to the alleviation of poverty in the recipient country (just as aid from any other country does).

In this paper, we revisit the aid-migration nexus and propose a strategy to identify the impact of development aid on migration with a special focus on the transmission channels at play. 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. This model describes the relationship between bilateral migration rates and bilateral as well as multilateral aid flows. Second, we rely on this gravity framework to estimate the causal impact of development aid on migration rates. To infer causality, we use an IV-2SLS strategy and a shift-share instrument (also known as a Bartik instrument; Bartik, 1991) that consists in re-weighting the total aid received by a country upon the distribution of aid by recipient sectors and donor countries observed at the beginning of the period. To disentangle the aforementioned channels, we estimate the impact of development aid from a donor to a recipient country on the reverse bilateral migration rates, as well as the impact of the remaining bilateral and multilateral aid received by the country. We then use these estimates to identify the channels through which aid can affect migration. Our identification strategy relies on the fact that the effect of multilateral aid can *only* be associated to a non-donor-specific effect because the identity of the donor countries is more difficult to identify for multilateral organisations than in the case of bilateral donations.

We use the DEMIG-C2C and AidData datasets from 1973 to 2010. Our sample covers 20 destination countries and 177 origin countries. We construct our sample such that a destination country also denotes an aid donor country, and an origin country denotes an aid recipient country. The sample includes 24,143 observations. Our strategy consists in analysing the impact of aid on migration for a sample of donor-recipient pairs that exhibit positive aid flows[2]. We therefore analyse the impact of aid on migration *conditional* on receiving aid. We find that aid from a donor country to a recipient country has a positive impact on the reverse migration rate, whereas aid from other donors has a negative impact on that rate. We also find that multilateral aid has a negative and weakly significant impact. We then test the transmission channels that can be at play. We find strong evidence that the effect of bilateral aid on migration is conveyed through an information channel. If that channel were the only one at play, then a 1% increase in bilateral aid would induce a 0.38% increase in the reverse bilateral migration rate. The magnitude of this effect is larger for the poorest countries. We find weak evidence that a development channel is at play. A 1% increase in multilateral aid induces a 0.01% decrease in the bilateral migration rate. Finally, we do not find any evidence for the credit constraint channel nor the instrumentation channel to respectively prevail over the development or the information channel.

The contribution of this paper is twofold. First, we propose a theoretically founded empirical analysis which allows us to neatly identify the four transmission channels through which development aid may impact migration. In doing so, we disentangle the effects that were previously misidentified in the literature and open the door to a research consensus on the global impact of development aid on migration. The paper most closely related to ours is a study by Lanati and Thiele (2018b). In this work, the authors revisit the aid-migration nexus using an econometric approach based on a gravity model of international migration. They obtain evidence of a negative relationship between the total bilateral aid that a country receives and its emigration rate. This result holds for very poor recipient countries suggesting that the credit constraint channel does not play a significant role in shaping migration decisions. Although our paper follows the same gravity-based approach, it differs from this study by disentangling the channels through which aid impacts migration rates. We argue that non-donor and donor-specific effects of aid can be identified more accurately thanks to the introduction of multilateral aid in the model, which is new in this literature. Second, contrarily to most of the literature, we only find weak evidence for the existence of a development or a credit constraint channel. This result lies on the fact that previous studies could not properly disentangle these channels from the donor-specific channels. Our results, however, are in line with findings of other scholars showing a limited and modest impact of aid on growth in recipient countries (Burnside and Dollar, 2000; Clemens et al., 2012): if aid has little impact on living standards in receiving countries, it is very unlikely that the development and credit constraint channels are active.

The remainder of the paper is organised as follows. In the next section, we review the transmission channels through which aid may impact migration and survey the related literature on the impact of aid on migration. In section 3, we build a RUM model of migration in which

[2] Our dataset does not include, for a given year, recipient countries which receive no aid flows. Recipient countries receive either bilateral aid, or/and multilateral aid.

we highlight how aid impacts individuals' probability to migrate, hence the emigration rate to any potential destination. In section 4, we present the data and a number of stylised facts. In section 5, we discuss our empirical strategy and how we disentangle the transmission channels. In section 6, we present the empirical results and a number of robustness tests. Section 7 concludes.

2 The aid-migration nexus

In this section, we start by reviewing the transmission channels through which aid may impact migration. Then, we survey empirical studies that estimate the effect of aid on migration, focusing on the features of their empirical strategy.

2.1 Transmission channels

The economic literature on the determinants of migration flows has pointed out several factors that play an important role in the decision of individuals to migrate (Hatton and Williamson, 2005). Economic factors such as the income differentials between countries and the level of poverty in the origin country are key determinants of individuals' decisions to change their country of residence. Geographical, cultural and demographic factors also play an important role in migration decisions as highlighted by the standard gravity model of migration (Beine et al., 2015). Then, the size of the diaspora explains the magnitude of migration flows and their perpetuation over time (Beine et al., 2011). Policies implemented by destination countries also influence migration decisions (Bertoli and Moraga, 2015). Finally, the credit constraints faced by migrants also shape migration flows, since only those who can afford the migration costs eventually migrate (Hatton and Williamson, 2005; Marchal and Naiditch, 2020). In a nutshell, migration flows from an origin country to a destination country depend on the utility differentials and on the bilateral migration costs between the origin country and potential host countries, as modelled in the RUM models of migration (Beine et al., 2015; Marchal and Naiditch, 2020).

Development aid is not a direct determinant of migration flows but an indirect one: it may impact migration via its effects on some determinants of migration (Parsons and Winters, 2014). Four transmission channels have been highlighted in the literature so far. We distinguish here between channels related to the non-donor-specific impact and those related to the donor-specific impact of aid on migration flows.

2.1.1 The non-donor-specific impact of aid on migration

Development aid received by a country may have an impact on its economic situation and, in turn, on its emigration rate. This indirect influence of aid on migration may run through two main channels with opposite consequences: a *development channel* and a *credit constraint channel*. As the link between emigration and economic development follows a bell-shaped pattern (De Haas, 2007), we expect the relative strength of these two opposite channels to be different in countries with different wealth levels.

The development channel. If aid increases disposable incomes in the recipient country, then it should improve the quality of life of individuals located in that country, which, in turn, should decrease their migration intentions. This is true if aid contributes to the development of the recipient country in general or to the improvement of specific sectors such as the education or health sectors. Through this development channel, aid has a negative impact on migration flows.

Several papers find supportive evidence for the development channel hypothesis. Berthélemy et al. (2009) show that total aid deters migration by increasing wages in countries of origin. This negative link between migration and development aid is also put forward in the case of rural development aid and governance aid by Gamso and Yuldashev (2018a,b). Lanati and Thiele (2018a,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. Moullan (2013) shows that foreign health assistance from OECD countries reduces the medical brain drain through medical equipment endowments and practice improvements. Dreher et al. (2019) and Lanati and Thiele (2018a) respectively show that in the long run, development aid decreases refugee and migration flows. Finally, Morrison (1982) also find supportive evidence for this channel.

The credit constraint channel. On the contrary, if the impact of aid on the recipient country's economy is positive, then it may help individuals to afford the costs of migration. Development aid may imply an alleviation of the credit constraints faced by potential migrants and hindering their migration and location choices, or may facilitate their education (by decreasing its cost for instance), thereby increasing their chances to emigrate. Through this credit constraint channel, the impact of aid on migration is positive.

A number of papers find support for the credit constraint channel (Faini and Venturini, 1993; Ugarte Ontiveros and Verardi, 2012; Angelucci, 2015; Morrison, 1982; Mughanda, 2011). For instance, Morrison (1982) reports some suggestive evidence that economic development generates better jobs that allow people to accumulate the money required to finance their migration from the Dominican Republic to the U.S. Ugarte Ontiveros and Verardi (2012) find that aid has a positive impact on emigration, and that aid targeted to development only relaxes the credit constraint of skilled migrants. Angelucci (2015) shows that the entitlement of poor Mexican households to an antipoverty conditional cash transfer program increases migration to the United States, because these cash transfers relax financial constraints in international migration. Finally, Dreher et al. (2019) find that in the short run, development aid may increase refugee flows.

Note that some scholars have shown that development aid may have detrimental effects on recipient economies (Castles et al., 2013). In that case, both channels mentioned above would run in the opposite direction. For clarity reasons, and because the bulk of existing literature mentioned hereinbefore does not corroborate this hypothesis, we do not investigate this potential effect in the remainder of the paper.

2.1.2 The donor-specific impact of bilateral aid on migration

Contrarily to other sources of aid (such as multilateral aid), bilateral aid is specific to a donor country. Therefore, it may have a specific impact on bilateral migration taking place from the aid recipient country to the aid donor country. Two channels have been put forward in the literature: the *information channel* and the *instrumentation channel*.

The information channel. Bilateral aid may convey information on the donor country, thus decreasing the cost of migration to that particular country. Through this information channel, bilateral aid should have a positive impact on the reverse bilateral migration flows.

A limited number of papers consider the specific information impact of bilateral aid flows on the corresponding migration flows or stocks. Morrison (1982) mentions the information channel in the case of migration to the U.S. The author argues that "social, commercial and political ties" engendered by aid increase migration flows by reducing costs and information deficits faced by individuals. Berthélemy et al. (2009) as well as Ugarte Ontiveros and Verardi (2012) find support for the information channel, especially in the case of skilled migrants; Lanati and Thiele (2018b) also find a significant positive impact of bilateral aid on reverse migration flows, but of smaller magnitude.

The instrumentation channel. A donor country could use bilateral aid strategically in order to influence the emigration policy of the recipient country. In other words, a developed country can donate aid under the (explicit or implicit) condition that the recipient developing country decreases emigration of its citizens to the donor country. This instrumentation channel implies that bilateral aid has a negative impact on the reverse migration flows through an increase in the corresponding bilateral migration cost.

Mughanda (2011) and Azam and Berlinschi (2009) are the only ones focusing on this hypothesis. Looking at Sub-Saharan African countries, Mughanda (2011) finds no supportive evidence for the instrumentation channel, while Azam and Berlinschi (2009) find evidence for it and argue that development aid is probably an effective tool for reducing the inflow of migrants into developed countries.

2.2 Survey of the empirical literature

Table 2 summarises the main empirical results of the literature on the link between development aid and migration[3]. With this survey, we intend to identify differences in the empirical analyses

[3]The studies of Faini and Venturini (1993) and Morrison (1982) are not included in this table because they are solely based on descriptive statistics and do not contain any econometric analysis.

proposed so far, in order to understand the mixed results of the literature and to guide our own empirical analysis.

First, there seems to be a tendency among reviewed studies to use the logarithm of the migration rate of the origin country as the explained variable. This dependent variable is rooted in the RUM model and gravity framework that are now standard in the migration literature (Beine et al., 2015). Then, most studies use aggregate data on bilateral migration and aid flows, with the exception of Angelucci (2015) who uses household Mexican data. Regarding aid, most papers studying the aid-migration nexus use aggregate data from the OECD-DAC (OECD Development Assistance Committee) and two recent papers by Gamso and Yuldashev (2018a,b) use AidData that contains information on development finance activities. The majority of papers use the logarithm of the aid flow as their variable of interest; yet some use aid as a percentage of the recipient country's GDP. Finally, instances using either aid commitments or aid disbursements are available in the literature.

Reviewed papers do not usually provide any information on the way they deal with missing aid flows. Gamso and Yuldashev (2018a) replace missing flows by zeros, while Moullan (2013) explains that this would bias the results downward if missing flows are non-reported positive flows. Either way, both papers find evidence that aid deters migration through a development channel which does not seem to indicate that replacing missing data with zeros could drastically change the results.

It is rather standard in the literature to distinguish *total bilateral* aid from *bilateral* aid (where total bilateral aid is the sum of the bilateral aid flows received by a country). There seems to be a consensus on the fact that the donor-specific channels can only be tested with bilateral data at hands and using origin-destination(-time) empirical frameworks (Azam and Berlinschi, 2009; Berthélemy et al., 2009; Lanati and Thiele, 2018b). However, none of these papers neatly differentiate between the non-donor-specific and the donor-specific effects of aid. Until now, researchers tend to roughly attribute the impact of total bilateral aid to a non-donor-specific effect (channelled either through a development or a credit constraint channel), and the impact of bilateral aid to a donor-specific effect (channelled through an information or an instrumentation channel).

In this paper, we argue that non-donor-specific and donor-specific impacts of aid on migration can be disentangled thanks to the analysis of bilateral and multilateral aid flows separately. Most of the existing studies do not exploit multilateral aid flows. Moullan (2013) explains that multilateral aid flows are poorly covered in the OECD-DAC dataset so that their inclusion in the aggregate aid flows might generate a selection bias in the data. Yet, the author mentions that his results remain stable whether he includes multilateral aid or not. However, two papers using AidData (Gamso and Yuldashev, 2018a,b) mention that they pool bilateral and multilateral aid together because this dataset is well suited to study multilateral aid contrarily to the OECD-DAC dataset.

Overall, available results on the impact of total bilateral aid on migration are mixed. There seems to be a clear-cut negative impact when studies exploit panel aggregate data, control for endogeneity and analyse the emigration rate (or the logarithm of the emigration rate) in a gravity set-up (Bandyopadhyay et al., 2014; Gamso and Yuldashev, 2018b; Lanati and Thiele, 2018a,b; Moullan, 2013). Instances of positive coefficients are found with household data (Angelucci, 2015) and specific sub-samples such as Sub-Saharan African countries (Mughanda, 2011) or for short-term aid (Berthélemy et al., 2009; Dreher et al., 2019).

Regarding bilateral aid, there seems to be a consensus about a positive impact on reverse migration among studies using either panel or cross-sectional aggregate data and controlling for the presence of an endogeneity bias (Berthélemy et al., 2009; Lanati and Thiele, 2018b). On the contrary, the impact seems to be negative (or ambiguous) when endogeneity is either poorly or not controlled for by the authors (Azam and Berlinschi, 2009; Mughanda, 2011).

Table 1: Empirical survey of the aid-migration nexus

Study	Angelucci (2015)	Azam and Berlinschi (2009)	Bandyopadhyay et al. (2014)	Berthélemy et al. (2009)	Dreher et al. (2019)
Causality	Aid → Migration	Aid → Migration	Aid→ Illegal migration	Aid → Migration	Aid → Refugees
Sample period	1997-1999	1993-2003	1996-2004	2000	1976-2013
Origin (recipient)	Mexico/Mexican households	All countries available	North & Central America	All	All
Destination (donor)	United States/Mexican states	OECD	United States	All	OECD
Migration data	Census data[a]	unknown	Homeland Security	World Bank	UNHCR
Migration variable	dummy[b]	log(flow)	log(rate)	log(stock)	log(flow)
Aid data	Census data[a]	OECD-DAC	OECD-DAC	OECD-DAC	OECD-DAC
Aid variable	dummy[c]	log(flow)	aid (% exports)	log(flow)	aid (% GDP)
Aid type	Cash transfers	Disbursements	Not mentioned	Disbursements & Commitments	Disbursements
Missing aid data	Unknown	Unknown	Unknown	Unknown	Unknown
Level of analysis	Household	Origin-destination-time	Origin-time	Origin-destination	Origin-time
Method	LPM	OLS	2SLS	3SLS	OLS, 2SLS
Endogeneity	Exogenous treatment	Additional controls	System of equations	System of equations	IVs
Impact of total aid	+[d]		-	+/-	
Impact of bilateral aid		-		+	+/-
Channel(s)	Credit constraint	Instrumentation	None mentioned	Credit constraint Development Information	Credit constraint Development

Study	Gamso and Yuldashev (2018a)	Gamso and Yuldashev (2018b)	Lanati and Thiele (2018a)	Lanati and Thiele (2018b)	Moullan (2013)
Causality	Aid → Migration	Aid → Migration	Aid → Migration	Aid → Migration	Aid → Migration
Sample period	1995-2010	1985-2010	2004-2014	1995-2014	1998-2004
Origin (recipient)	All	All	All	All	All
Destination (donor)	OECD	OECD	OECD	OECD	OECD & South Africa
Migration data	IAB	IAB	OECD	OECD	Bhargava and Docquier (2007)
Migration variable	rate	rate	log(rate)	log(rate)	log(rate)
Aid data	AidData	AidData	OECD-DAC	OECD-DAC	OECD-DAC
Aid variable	aid (% GDP)	aid (% GDP)	log(flow)	log(flow)	log(flow)
Aid type	Not mentioned	Not mentioned	Disbursements	Disbursements	Commitments
Missing aid data	Replaced by 0	Unknown	Unknown	Unknown	Left missing
Level of analysis	Origin-destination-time	Origin-time	Origin-destination-time	Origin-destination-time	Origin-time
Method	OLS, 2SLS, PSM	OLS, 2SLS	OLS, 3SLS	OLS, 3SLS	GMM
Endogeneity	IVs and PSM	IVs	System of equations	System of equations	GMM
Impact of total aid			-	-	
Impact of bilateral aid	0/-	-	+	+	-
Channel(s)	Development	Development	Credit constraint Development	Credit constraint Development Information	Development

Note: [a]: Data come from the Mexico's antipoverty conditional cash transfer programme. [b]: The dummy is equal to one if at least one person migrated to the United States in the household. [c]: The dummy is equal to one if the household benefits from the aid programme. [d]: Effect of the dummy variable.

Table 2: Empirical survey of the aid-migration nexus (continued)

Study	Mughanda (2011)	Murat (2020)	Ugarte Ontiveros and Verardi (2012)
Causality	Aid → Migration	Aid → Refugees	Aid → Migration
Sample period	Unknown	1993-2013	1975-2000
Origin (recipient)	All	All	195 countries
Destination (donor)	Sub-Sahara Africa	OECD	6 developed countries
Migration data	United Nations	UNHCR	Defoort and Rogers (2008)
Migration variable	log(rate)	log(flow)	rate
Aid data	OECD-DAC	OECD-DAC	OECD-DAC
Aid variable	log(flow)	log(flow)	Aid (% GDP)
Aid type	Not mentioned	Disbursements	Disbursements
Missing aid data	Unknown	Unknown	Unknown
Level of analysis	Origin-time	Origin-destination-time	Destination-time
Method	OLS	system GMM	FE, 2SLS , GMM
Endogeneity	Not addressed	IVs, system GMM	IVs, GMM
Impact of total aid	+		+
Impact of bilateral aid		+/-	
Channel(s)	Credit constraint	Credit constraint	Credit constraint (esp. for skilled)
		Development	Information (for skilled)

3 A RUM model of migration with development aid

In this section, we build a RUM model from which we derive the equation to be estimated on our sample of countries. We model the migration decision of an individual i considering D destinations, including his country of current residence, country o. We first present the assumptions of the model, before focusing on the main results.

3.1 The theoretical framework

3.1.1 The migration choice

At time t, individual i faces a choice among D destinations (including his own country o). To each possible destination corresponds a different level of net utility, depending on the characteristics of the individual and of each destination. Let $U_{iod,t}$ denote the net 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 his net utility such that $U_{iod,t} = \max_{l \in \{1,\ldots,D\}} U_{iol,t}$. Following Beine et al. (2015), we assume that individual i makes myopic decisions, deciding whether to migrate or not and where to at each period of his lifetime.

3.1.2 The utility function

Although the individual's net utility is unknown, one can observe some attributes of the alternatives faced by the individual. We can thus specify a function relating these observed attributes to the utility of the individual.

At time t, 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) which captures the utility we can estimate statistically, 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 $C_{oo,t} = 0$)[4]. Then, his net 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.

[4]The bilateral migration cost between two countries is composed of two parts: a financial cost of migration *per se* (here denoted $C_{od,t}$) and a psychological cost of being away from home. Following Marchal and Naiditch (2020), we consider that the financial cost does not vary across individuals whereas the psychological cost differs across individuals; the latter is then included in the individual-specific stochastic term. Hereafter, for the sake of simplicity, any reference to the migration cost refers to the financial migration cost.

3.1.3 Migration probabilities and migration rates

Following the results of McFadden (1974, 1984), the unconditional probability that an individual relocates from country o to destination d at time t reads as follows:

$$p_{od,t} = \Pr\left(U_{iod,t} = \max_{l=1\dots D} U_{iol,t}\right) = \frac{e^{(W_{od,t}-C_{od,t})}}{\sum_{l=1}^{D} e^{(W_{ol,t}-C_{ol,t})}}. \tag{2}$$

Similarly, the unconditional probability that an individual remains in country o at time t is given by:

$$p_{oo,t} = \Pr\left(U_{ioo,t} = \max_{l=1\dots D} U_{iol,t}\right) = \frac{e^{W_{oo,t}}}{\sum_{l=1}^{D} e^{(W_{ol,t}-C_{ol,t})}}. \tag{3}$$

The bilateral migration rate at time t, denoted $\text{Mig}_{od,t}$, is given by the ratio of these two probabilities:

$$\text{Mig}_{od,t} = \frac{e^{(W_{od,t}-C_{od,t})}}{e^{W_{oo,t}}} = e^{(W_{od,t}-W_{oo,t}-C_{od,t})}. \tag{4}$$

Taking the logarithm of equation (4), we get:

$$\ln \text{Mig}_{od,t} = W_{od,t} - W_{oo,t} - C_{od,t}. \tag{5}$$

The bilateral migration rate depends only on the characteristics of the origin and destination countries, and on the corresponding bilateral migration cost. This is representative of the IIA property: any change in the attractiveness or accessibility of other destinations will not directly affect the bilateral migration rate from country o to country d (Beine et al., 2015). In other words, there is a proportional substitution across alternative destinations. However, policies implemented by destination countries may *indirectly* impact migration rates to other countries, if they have an impact on the determinants of these migration rates, such as the utility in the origin country or the capacity to finance migration costs. Thus, we can introduce some form of multilateral resistance to migration in the model in line with Bertoli and Fernández-Huertas Moraga (2013) and Marchal and Naiditch (2020)[5].

3.1.4 Transmission channels

For any variable X impacting utilities and migration costs, such as development aid received by country o, we find that:

$$\frac{\partial \text{Mig}_{od,t}}{\partial X} = \left[\frac{\partial\left(W_{od,t} - C_{od,t}\right)}{\partial X} - \frac{\partial W_{oo,t}}{\partial X}\right] \text{Mig}_{od,t} \tag{6}$$

As emphasised in section 2, development aid impacts the utility of individuals in their own country as well as the migration costs and, in turn, impacts migration rates. This impact is

[5] The concept of *multilateral resistance to migration* embodies the idea that migration from one country to another depends not only on the corresponding migration cost but also on the migration costs from this origin country to alternative destination countries.

probably not instantaneous so it seems sensible to assume that migration rates at time t are determined by the amount of development aid received at time $t-1$. Note that, in doing so, we also attenuate the risk of endogeneity due to reverse causality between aid and migration. In the following, we denote by $\text{Aid}_{do,t}$ the amount of bilateral aid donated by country d to country o at time t, by $\text{Aid}_{(-d)o,t}$ the amount of bilateral aid donated by all the donor countries but d to country o at time t and by $\text{MultiAid}_{o,t}$ the amount of multilateral aid received by country o at time t.

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

$$\frac{\partial W_{oo,t}}{\partial \text{Aid}_{do,t-1}} \geqslant 0 \; \forall d \tag{7}$$

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:

$$\frac{\partial C_{od,t}}{\partial \text{Aid}_{d'o,t-1}} \leqslant 0 \; \forall \left(d, d'\right) \tag{8}$$

Note that the RUM model does not explicitly take into account the credit constraint of individuals[6]. 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).

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:

$$\frac{\partial C_{od,t}}{\partial \text{Aid}_{do,t-1}} \leqslant 0 \; \forall d \tag{9}$$

and positive for the instrumentation channel:

$$\frac{\partial C_{od,t}}{\partial \text{Aid}_{do,t-1}} \geqslant 0 \; \forall d \tag{10}$$

3.2 Main theoretical results

Depending on the prevailing channel, multilateral and bilateral aid flows will have a different impact on migration rates. The results are summarised in Table 3. First, in the case of multilateral aid flows, donor countries are unknown to the recipient country. Thus, the only active channels are the non-donor-specific ones. We can infer from equations (6)-(8) that 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. From equations (6)-(10), we can infer the following: Concerning the non-donor-specific

[6] The consequences of this omission are dealt with in the paper by Marchal and Naiditch (2020).

impacts, 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.

Finally, 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 donor-specific channels. However, this may not systematically be the case. For instance, a decrease in the bilateral migration costs from country o to country d' induced by an increase in bilateral aid from country d' to country o (information channel) may decrease the migration rate from country o to country d: among individuals who wished to migrate to country d before the aid increase, more may decide to migrate to country d' than to stay in their origin country following the aid increase. We test the existence of such a redirection effect in the empirical part of the paper.

Overall, the results derived from the RUM model presented in this section and summarised in Table 3 enable one to understand, for each type of aid, what channels are at play and what would be the effect of aid on bilateral migration if one channel were to prevail. More precisely, our empirical results will be based on the theoretical results and will exploit the fact that only non-donor-specific channels are at play for multilateral aid. Our strategy will consist in using multilateral aid to identify the non-donor-specific effects of aid on migration. Then, using these results, we can measure donor-specific effects of aid on migration. Our empirical analysis will allow us to distinguish between donor-specific and non-donor-specific effects, but within these effects, we will not be able to differentiate between the conflicting channels.

Table 3: The theoretical impact of development aid on migration rates

	Non-donor-specific channels		**Donor-specific channels**	
Prevailing channel:	Development	Credit constraint	Information	Instrumentation
Impact of multilateral aid on migration to country d				
$\frac{\partial \text{Mig}_{od,t}}{\partial \text{MultiAid}_{o,t-1}}$	$\leqslant 0$	$\geqslant 0$	$= 0$	$= 0$
Impact of bilateral aid from d on migration to country d				
$\frac{\partial \text{Mig}_{od,t}}{\partial \text{Aid}_{do,t-1}}$	$\leqslant 0$	$\geqslant 0$	$\geqslant 0$	$\leqslant 0$
Impact of bilateral aid from all other donors on migration to country d				
$\frac{\partial \text{Mig}_{od,t}}{\partial \text{Aid}_{(-d)o,t-1}}$	$\leqslant 0$	$\geqslant 0$	$= 0$	$= 0$

4 Data and stylised facts

In this section, we start by describing the data we use to test the empirical predictions of our theoretical model. We then present a number of stylised facts describing the relationship between development aid and migration.

4.1 Data sources

4.1.1 Migration data

We use the DEMIG-C2C dataset (version 1.2) from the International Migration Institute of the University of Oxford which builds on existing OECD and UN Population Division databases[7]. This dataset contains bilateral migration flows for 34 destination countries from 1946 to 2011. Destination countries include most OECD countries and a number non-OECD countries such as Argentina, Brazil, Czechoslovakia, South Africa and Uruguay.

The DEMIG-C2C dataset contains data as reported by national statistical offices. Given that countries adopt different definitions for migrants, the dataset includes several criteria to characterise migration flows. Countries report immigration flows by country of birth, by previous residence country and/or by citizenship. To define the country of origin of the migrants, we favour the *previous country of residency* over the *country of citizenship* that we in turn favour over the *country of birth*. Note that only a few countries (e.g. the U.S.) use the *country of birth* to define immigrant individuals. Furthermore, DEMIG-C2C allows us to distinguish, depending on the reporting countries, between movements of foreign individuals into a country, movements of individuals returning to their home country (return migration), and movements of *all* individuals into a country (including both foreign individuals and return migrants). When possible, we use movements of foreign individuals in order to exclude return migrants (because return migration may be explained by different determinants), otherwise we use movements of *all* individuals. In a robustness test, we use a more restrictive definition by exclusively using flows of *foreign individuals* hence excluding potential return migration. Finally, reported migration flows may or may not include irregular migrants[8].

4.1.2 Aid data

Data on development aid come from AidData (core release v3.1) from William & Mary's Global Research Institute[9]. This dataset is the most comprehensive information source to date tracking international financial aid flows. It contains commitment information for 96 donors expressed in constant U.S. dollars. That consists in more than 1.5 million activities funded over the 1947-2013

[7] For more details, see https://www.migrationinstitute.org/data/demig-data/demig-c2c-data.

[8] Besides, while some countries include refugees in their statistics, others do not provide any information on this point. DEMIC C2C does not allow us to systematically exclude or include refugees.

[9] For more details, see https://www.aiddata.org/data/aiddata-core-research-release-level-1-3-1.

period[10]. For each activity, the data contains the financial value of money, goods or services declared by the donor. Types of flows recorded in AidData include Official Development Assistance and Other Official Flows as well as Export Credits and Equity Investments. The dataset includes bilateral contributions as well as earmarked contributions made by donors to multilateral organisations (the dataset, however, does not include core contributions to multilateral organisations in order to reduce the risk of double counting). Activities originating from nongovernmental organisations and private investors such as banks or foundations are not included in AidData.

AidData has become a standard alternative to the OECD-DAC database and is now used by a number of researchers studying development aid (Tierney et al., 2011; Bermeo and Leblang, 2015; Gamso and Yuldashev, 2018a,b). In the case of our study, the main advantage of using AidData over the OECD-DAC database is to enable us to distinguish between *bilateral* and *multilateral* aid flows. We define bilateral aid flows as the sum of flows provided directly by a donor country to an aid recipient country. We define multilateral flows as those provided by a donor country to a recipient country through a multilateral agency (for instance the United Nations or the European Development Funds). In this case, the identity of the donor country is unknown to the recipient. For a given year, a recipient country is included in AidData only if it receives bilateral aid from at least one donor. Thus, a recipient country may be included in AidData but may not receive any multilateral aid. In this case, its multilateral aid is null (and not missing).

Finally, AidData allows us to build an identification strategy based on the observed distribution of aid across recipient sectors and donors at the beginning of the period. Aid activities are distributed across eight main sectors: social infrastructure and services; economic infrastructure and services; production sectors; general environmental protection; general budget support; action relating to debt; emergency assistance and reconstruction; administrative costs. To construct this classification, we use the first digit of the *coalesced purpose code* available for each aid flow reported in the dataset[11]. These codes are then used to classify activities according to their sectors[12].

4.1.3 Other data sources

The remaining dyadic variables of interest are taken from the GeoDist database developed by the CEPII which contains variables related to the geographical, cultural as well as linguistic

[10] AidData only contains disbursements from 2013 onward. We can therefore not use disbursement information in the context of our study. In addition, as explained by Moullan (2013) and Berthélemy (2006), aid commitments better reflect the donor decisions, while aid disbursements partly depend on the recipient country's ability to receive the funds (for instance on its administrative capacity or its political context). Aid commitments could therefore be more exogenous to migration than aid disbursements.

[11] For more details on the coalesced purpose classification elaborated by the OECD, see `https://www.oecd.org/dac/stats/purposecodessectorclassification.htm`.

[12] For instance, an activity dedicated to "medical education and training" is coded 12181. We then gather all activities with a code starting by a "1" under the sector "social infrastructure and services". When no coalesced purpose code is available, we classify the aid flow under the category "unknown purpose".

distances between countries (Mayer and Zignago, 2011). We use the Gravity database of the CEPII that provides other dyadic variables as well as countries' GDP to perform gravity-type analyses (Head et al., 2010). We also use aggregate data from the World Development Indicators of the World Bank such as population and bilateral migration stocks[13]. Finally, we use the Worldwide Governance Indicators from the World Bank, in particular the index of perception of the rule of law that "captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence"[14].

4.2 Descriptive statistics and stylised facts

After merging these datasets, we obtain a sample made of 24,143 origin-destination-year observations covering 20 destination countries and 172 origin countries over the period 1973-2010[15]. Note that our sample includes 19,326 observations for which we have information from both DEMIG-C2C and AidData and 4,817 observations for which we do not have information from AidData. To deal with missing aid flows *i.e.* with observations that are included in DEMIG-C2C but missing in AidData, we follow the approach of Moullan (2013). We do not replace missing aid flows by zeros. In doing so, we do not rule out the possibility that missing observations could be missing positive values. In a robustness test, we will consider missing aid flows to be zeros.

The distribution of observations over time is presented in appendix, Figure A.1 and shows an increase in the number of observations available across years which reflects both the increase in aid donations as well as the increase in the data availability over time. It also shows the distribution of observations for which we have information for both DEMIG-C2C and AidData and the distribution of observations for which we have information from DEMIG-C2C. The difference between the two distributions hence shows the distribution of missing aid flows.

We report a number of summary statistics in Table 4. Our variable of interest is the bilateral migration rate between an origin country and a destination country. This rate is the ratio of the bilateral migration flow observed between the two countries to the population of the origin country. Our sample includes a small number of migration rates equal to zero. Our main explanatory variable is the bilateral aid flow from a donor country to a recipient country. On average, a recipient country receives about 752.9 million U.S. dollars of total bilateral aid per year and 1,029 million U.S. dollars of multilateral aid.

In what follows, we exploit the fact that the distribution of bilateral aid across sectors and donor countries varies over time to build our identification strategy. Therefore, we present the distribution of total bilateral aid flows across sectors at the beginning and at the end of the sample period in Figure 1. In 1973, less than a quarter of bilateral aid flows is directed toward social

[13]For more details, see `https://databank.worldbank.org/source/world-development-indicators`.

[14]For more details, see `https://datacatalog.worldbank.org/dataset/worldwide-governance-indicators`.

[15]We recall that a destination country also denotes an aid donor country, and an origin country denotes an aid recipient country.

Table 4: Summary statistics

Variable	Mean	Std. Dev.	Min.	Max.	Obs.
Migration					
Bilateral migration flow (thousands of people)	1.803	11.376	0	947.912	24,143
Population (millions of people)	50.742	171.221	0.009	1,338	24,143
Bilateral migration rate (in percentage)	0.026	0.118	0	5.802	24,143
Development aid					
Bilateral aid (millions of current U.S.$)	58.162	236.634	0.000	11,119	19,326
Total bilateral aid (millions of current U.S.$)	752.899	1,299	0.001	24,518	19,326
Rest of bilateral aid (millions of current U.S.$)	694.737	1,241	0	24,518	19,326
Multilateral aid (millions of current U.S.$)	1,029	2,783	0	61,688	19,326
Control variables					
1970 bilateral migration stock (thousands of people)	33.460	204.279	0	4,662	24,143
Distance between capital cities (kilometres)	6,903	3,416	59.617	17,397	24,143
Common language	0.189	0.391	0	1	24,143
Colonial relationship	0.064	0.245	0	1	24,143
GDP (billions of current U.S.$)	80.718	299.411	0.009	5,931	24,087
GDP (billions of current U.S.$)	2,100	3,416	6.463	14,964	24,143

infrastructure and services, and economic infrastructure and services. The production sectors and the support to governments' budgets are two other large sectors toward which bilateral aid is directed. The distribution of aid differs in 2010. The share attributed to social infrastructure and services has drastically increased to the detriment of other sectors.

Similarly, we show the distribution of total bilateral aid flows across main donors at the beginning and at the end of the sample period in Figure 2. We see that the major donor countries in our dataset are the United States and Germany. There is quite some variation in the amount of aid attributed by the main donor countries over time. Although not visible on this figure, there is also some variation in the composition of donor countries from the perspective of the aid recipient countries: about 7.58% of recipient countries experience a decrease or an increase in the number of countries that attribute them aid from one year to another.

Figure 3 shows the density distribution of the bilateral aid, total bilateral aid and multilateral aid (in logarithm of current U.S.$) for the sample period. By construction, the dataset only contains countries receiving a strictly positive amount of bilateral aid. However, many of these countries receive null multilateral aid flows, as evidenced by the density of multilateral aid. Comparing the densities of bilateral and multilateral aid flows, we see that, on average, the amounts of multilateral aid flows are higher than bilateral donations, but that they are more concentrated around the mean than bilateral aid flows. Similarly, we report the density distribution of bilateral migration rates for the full-time period in appendix, Figure A.2. This figure

Figure 1: Distribution of total bilateral aid across sectors in 1973 and 2010

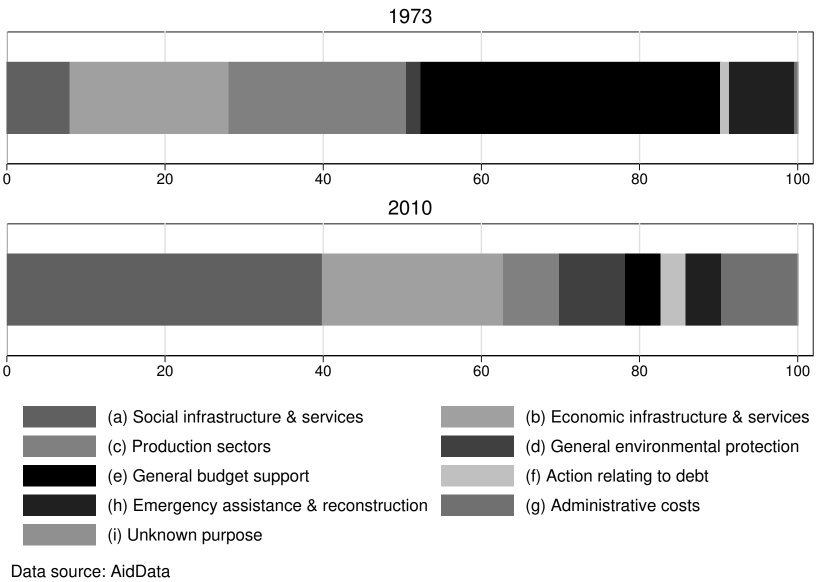
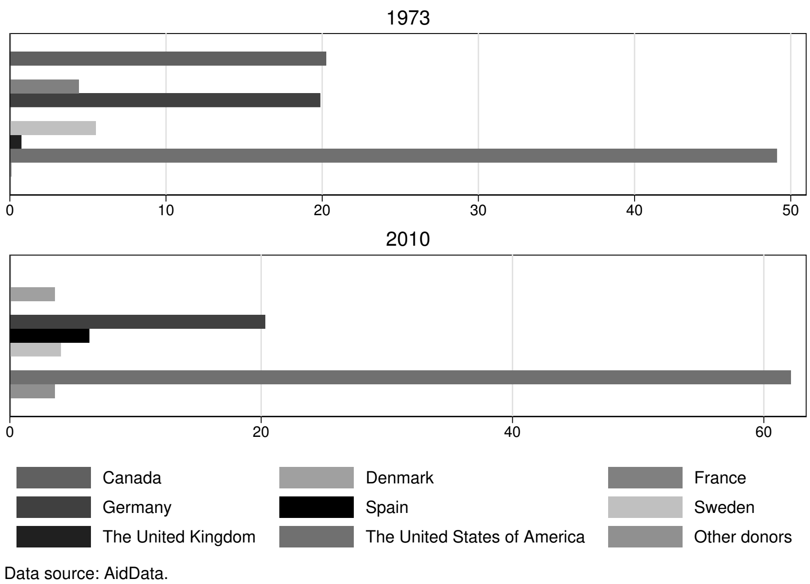
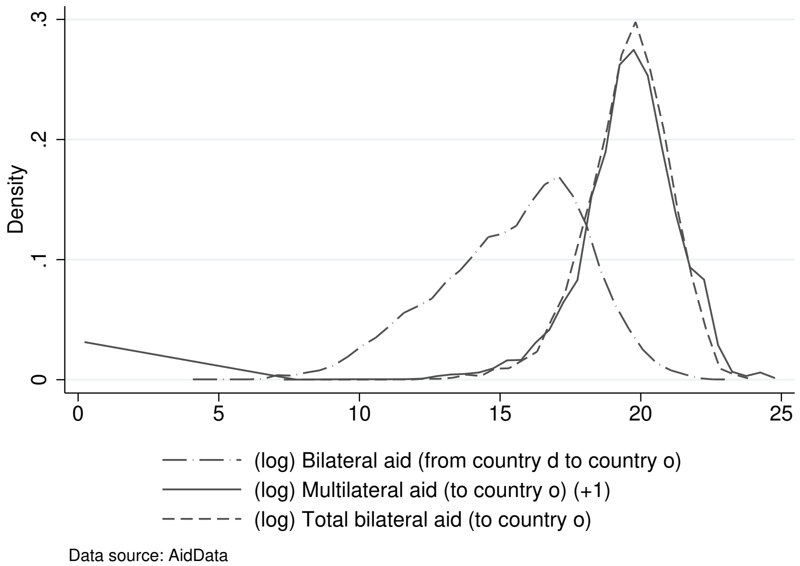


Figure 2: Distribution of total bilateral aid across main donors in 1973 and 2010



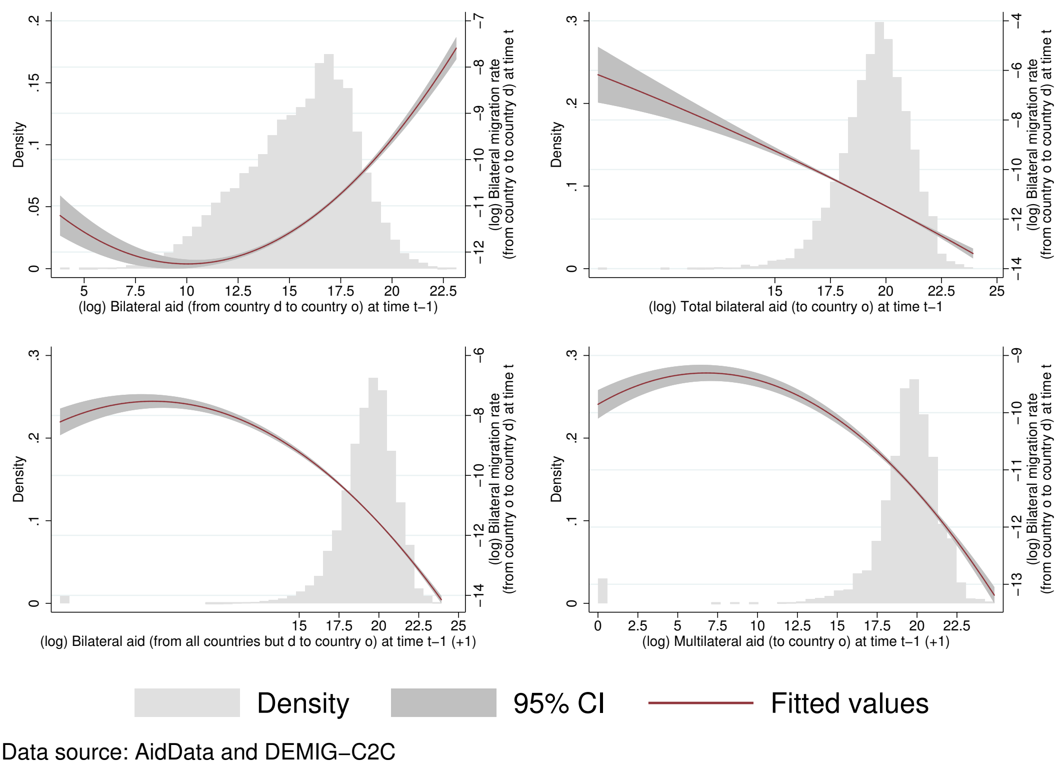
excludes null migration rates and shows negative values because we plot the logarithm of the rate (which is lower than 1). The distribution appears to be normally distributed.

Figure 3: Densities of development aid flows



We depict the relationship between aid and migration in Figure 4. We use a quadratic fit to plot the (log) amount of development aid received by country o against the (log) bilateral rate of migration from country o to country d (thus excluding zeros). We also report the distribution of observations used to compute this fit. First, the upper-left figure shows a convex relationship. Bilateral aid is at first negatively correlated with the reverse migration rate, yet the correlation quickly becomes positive. The negative relationship could indicate the weak prevalence of a development or an instrumentation channel, while the positive relationship could indicate the prevalence of a credit constraint or an information channel. Second, the relationship between the bilateral migration rate and the bilateral aid received by country o from *all* countries but d (lower-left figure) is concave. Bilateral aid is at first positively correlated with the migration rate, yet the correlation quickly becomes negative. The positive relationship could indicate the prevalence of a credit constraint or an instrumentation channel specific to other donors. The negative relationship could indicate that a development or an information channel specific to other donors prevail. This information channel specific to other donors summarises the fact that when other donors send more aid, they send more information about themselves, increasing incentives to migrate there and decreasing incentives to migrate to country d. Similarly, the instrumentation channel specific to other donors summarises the fact that when other donors send more aid, they may ask receiving governments to decrease migration flows to their economies, increasing incentives to migrate to country d. Third, in line with the literature, we study the relationship between the bilateral migration rate and the total bilateral aid received by country o (upper-right figure). This relationship is linear and negative. The implications in terms of channels are not straightforward since total bilateral aid includes aid given by donor d and other donors. Finally, we find a concave relationship between the bilateral migration rate and multilateral aid to country o (lower-right figure). Multilateral aid is at first positively correlated with migration. This relationship is driven by the bulk of observations that exhibit null multilateral aid flows. The correlation then becomes negative. Considering that multilateral aid flows are non-donor-specific and encompass only non-donor-specific effects of aid, the positive relationship could indicate the prevalence of a credit constraint channel while the negative relationship points toward the prevalence of a development channel. These correlations are informative, but, since they do not control for endogeneity issues, they may not give an accurate picture of the relationship between migration and aid.

Figure 4: Bilateral migration rates and development aid



5 Empirical strategy

5.1 From theory to empirics

To test the predictions of our theoretical model, we follow the literature and assume a logarithmic relationship between individuals' utility and bilateral aid. Given the various determinants of the deterministic utilities and the financial migration costs, equation (5) can be rewritten as the following gravity equation:

$$\begin{aligned}\ln \mathrm{Mig}_{od,t} =& \beta_0 + \beta_1 \ln \mathrm{Aid}_{do,t-1} + \beta_2 \ln \mathrm{Aid}_{(-d)o,t-1} + \beta_3 \ln \mathrm{Multi}_{o,t-1} \\ &+ B'\Gamma + \gamma_o + \gamma_d + \gamma_t + \epsilon_{od,t}\end{aligned} \tag{11}$$

where $\ln \mathrm{Mig}_{od,t}$ is the logarithm of the bilateral migration rate from country o to country d at time t. We will present a robustness test in which we do not log-transform the dependent variable and use a Poisson estimator instead, in order to keep null migration rates into the sample.

$\mathrm{Aid}_{do,t-1}$ denotes the flow of bilateral aid donated by country d to country o at time $t-1$, $\mathrm{Aid}_{(-d)o,t-1}$ denotes the amount of bilateral aid donated by other countries than d to country o at time $t-1$ and $\mathrm{Multi}_{o,t-1}$ is the total amount of multilateral aid donated to country o at time $t-1$. Note that $\mathrm{Aid}_{(-d)o,t-1}$ and $\mathrm{Multi}_{o,t-1}$ are increased by one in order to keep zeros once the variables are log-transformed.

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 had a colonial relationship and zero otherwise. As an alternative to these dyadic variables, one could use a set of origin-destination fixed effects to lower the risk of omitted variable bias. However, we exclude this strategy as our variables of interest exhibit little within variations[16]. Γ also includes the (log) bilateral stock of emigrants in 1970 and the (log) GDP of the origin and destination countries at time $t-1$. We include the latter control variables to capture changes in the wealth of the origin and destination countries over time.

γ_o, γ_d and γ_t respectively denote origin, destination and time fixed effects (FE). In all estimations, standard errors are clustered within the origin-time and destination-time dimensions. Errors are likely to be correlated within these two dimensions as one can expect unobserved time-varying and country-specific decisions to be correlated with migration decisions made at a given time. In two robustness tests, we will show to what extent the structure of fixed effects and level of clustering affect our results.

The correlations between the explanatory variables included in equation (11) are presented in appendix, Table A.1. This table shows moderate correlation coefficients and therefore no concerns of multicolinearity.

[16] The mean of the dependent variable amounts to -11.258 and its standard deviation to 2.405. The between variation amounts to 2.323 while the within variation amounts to 0.672. The two variations do not sum-up since our panel is not balanced.

5.2 Endogeneity concerns

The main source of endogeneity that could bias the estimation of equation (11) 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 corresponding 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 public aid (Bermeo and Leblang, 2015). Other papers have shown that some countries donate aid based on altruism while others attribute aid based on economic and political concerns (Berthélemy, 2006). Yet, these concerns may be correlated with migrants' decisions and therefore induce a simultaneity bias in our results. To address these endogeneity issues, we implement an instrumental variable (IV) strategy that consists in instrumenting $\text{Aid}_{do,t-1}$ and $\text{Aid}_{(-d)o,t-1}$. We do not instrument multilateral aid as it is less subject to be determined by the flow of migrants to a specific donor country. We will however instrument it in a robustness test.

To obtain causal results, we need to identify how exogenous variations in bilateral aid impact migration decisions. We therefore need instruments that impact bilateral aid flows but do not influence migration decisions. To build instruments that respect this exclusion restriction, we rely on an imputation method based upon the seminal papers of Bartik (1991) and applied to the migration literature by Card (2001). This type of instruments – also called shift-share instruments – is now standard in migration economics.

We instrument $\text{Aid}_{do,t}$ and $\text{Aid}_{(-d)o,t}$ using two variables that we build as follows:

$$\text{IV}_{do,t} = \sum_{s} \frac{\text{Aid}_{do,s,t_0}}{S_{o,t_0}} S_{o,t} \;\; \forall t > t_0 \tag{12}$$

$$\text{IV}_{(-d)o,t} = \sum_{s} \sum_{d' \neq d} \frac{\text{Aid}_{d'o,s,t_0}}{S_{o,t_0}} S_{o,t} \;\; \forall t > t_0 \tag{13}$$

where s denotes the aid sector, t_0 denotes the first year a country pair enters the sample and $S_{o,t} = \sum_s \sum_d \text{Aid}_{do,s,t}$ represents the sum of bilateral aid flows received by country o at time t. Note that we consider all sectors but the sector "Emergency assistance and reconstruction" to build the shift-share instruments because this type of aid is circumstantial and should therefore not impact the distribution of aid across sectors over time.

In some specifications, we instrument the total bilateral aid received by country o ($\text{Aid}_{o,t}$) as follows:

$$\text{IV}_{o,t} = \sum_{s} \sum_{d} \frac{\text{Aid}_{do,s,t_0}}{S_{o,t_0}} S_{o,t} \;\; \forall t > t_0 \tag{14}$$

Our instruments rely on the distribution of aid across sectors and donor countries observed at the beginning of the period. They are presumably exogenous because we assume that the initial distribution of aid across donors and sectors is not correlated with recipient countries' migration rates at time t. For instance, in equation (12), the approach consists in weighting the total aid received by country o at time t ($S_{o,t}$) by the share of aid received from donor country d in all sectors at time t_0 (Aid_{do,s,t_0}) in the total aid received by country o at time t_0 (S_{o,t_0}). In other words, we assume that, although the absolute amount of aid received by country o from a donor d may vary over time, the distribution of aid across sectors and donors remains constant. In doing so, we only consider the change in the *demand* for aid (e.g. that could be induced by a change in the economic conditions in origin countries) holding the determinants of the *supply* constant. 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 other countries ($\forall d' \neq d$).

Based on equation (11), our IV strategy can be written as follows:

$$\begin{aligned}\ln \text{Mig}_{od,t} =& \beta_0 + \beta_1 \widehat{\ln \text{Aid}_{do,t-1}} + \beta_2 \widehat{\ln \text{Aid}_{(-d)o,t-1}} + \beta_3 \ln \text{Multi}_{o,t-1} \\ &+ B'\Gamma + \gamma_o + \gamma_d + \gamma_t + \epsilon_{od,t} \end{aligned} \tag{15}$$

where $\widehat{\ln \text{Aid}_{do,t-1}}$ and $\widehat{\ln \text{Aid}_{(-d)o,t-1}}$ are respectively obtained from the predictions of the two following first stage equations:

$$\begin{aligned}\ln \text{Aid}_{do,t-1} =& \alpha_0 + \alpha_1 \ln \text{IV}_{do,t-1} + \alpha_2 \ln \text{IV}_{(-d)o,t-1} + \alpha_3 \ln \text{Multi}_{o,t-1} \\ &+ A'\Gamma + \gamma_o + \gamma_d + \gamma_t + \varepsilon_{od,t} \end{aligned} \tag{16}$$

$$\begin{aligned}\ln \text{Aid}_{(-d)o,t-1} =& \delta_0 + \delta_1 \ln \text{IV}_{do,t-1} + \delta_2 \ln \text{IV}_{(-d)o,t-1} + \delta_3 \ln \text{Multi}_{o,t-1} \\ &+ D'\Gamma + \gamma_o + \gamma_d + \gamma_t + \zeta_{od,t} \end{aligned} \tag{17}$$

In the literature, a limited number of instrumental variables have been proposed due to the difficulty to find an exogenous variable respecting the exclusion restriction. The fact that migration and aid are determined by very similar economic, political and historical factors makes the choice of an instrument challenging. In a recent paper, Dreher et al. (2019) instrument the share of aid by the interaction of the level of fractionalisation of the donor's government with the recipient's probability of receiving aid. However, this instrument relies mostly on variations between donor and non-donor countries. We cannot use this instrumentation strategy because our sample excludes countries that do *not* donate. Then, Gamso and Yuldashev (2018a,b) follow a method proposed by Lewbel (1997) that consists in using the second and third central moments of the aid distribution. We will use this instrumentation strategy in a robustness test.

5.3 Identification of the transmission channels

Equation (11) – or equation (15) when endogenous variables are instrumented – allows us to study the transmission channels through which development 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 on migration. Let us start by focusing on the non-donor-specific channels. To test whether 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 elasticity of the migration rate with respect to the multilateral aid is given by β_3 (equation 11 or 15). In other words, if $\text{Multi}_{o,t-1}$ increases by 1%, all things being equal, the migration rate varies by β_3 percent.

We consider that this aid is *cleaned* from donor-specific effects as it is channelled through a third-party organisation. Hence, the origin of this aid is more difficult to identify for the recipient country. One could argue that the donor countries can still be identified by the recipient country; yet the fact that the aid flow comes from several donors should blur its information and donor-specific content.

The sign of β_3 should therefore indicate which of the two non-donor-specific and conflicting channel prevails. 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 sign of β_3 indicates which of the development or the credit constraint channel prevails, whether both channels are simultaneously at play or not.

The donor-specific impact of aid on migration. We now analyse the donor-specific channels. 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 (equation 11 or 15). This coefficient potentially encompasses non-donor-specific *and* donor-specific effects. For instance, when the amount of aid sent by a donor country to a recipient country increases, then information about the donor country received by residents of the recipient country may increase. Yet, this increase in aid may also impact the wealth of individuals in the recipient country, and thus impact migration through the development and credit constraint channels, just as aid from any donor may.

Therefore, to isolate the impact of aid channelled via donor-specific effects, we study the impact of an increase in aid from country d to country o holding the full aid received by country o and the composition of aid received from other donor countries constant[17]. 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 at play are only those related to the donor country d. In other words, if $\text{Aid}_{do,t-1}$ increases by x% and $\text{Multi}_{o,t-1}$ decreases by y%, with $y = x * (\text{Aid}_{do,t-1}/\text{Multi}_{o,t-1})$, then the full aid received by country o is constant, as well as the composition of aid received from other donor countries. If $\text{Aid}_{do,t-1}$ increases by 1% and $\text{Multi}_{o,t-1}$ decreases by $\text{Aid}_{do,t-1}/\text{Multi}_{o,t-1}$ percent, then the migration rate changes by $\beta_1 - \beta_3(\text{Aid}_{do,t-1}/\text{Multi}_{o,t-1})$ percent. This coefficient

[17]We define the full aid received by country o as the sum of bilateral and multilateral aid flows received by country o.

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 information and the instrumentation channels for all donors but d, we study the sign and significance of $\beta_2 - \beta_3(\text{Aid}_{(-d)o,t-1}/\text{Multi}_{o,t-1})$, which captures the change in the proportion of individuals who would migrate to country d due to a change in the composition of aid received from 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 the impact of aid received from other countries on migration to d.

Discussion. Our identification strategy of the transmission channels relies on the assumption that 1$ of aid contribution by a multilateral agency has the same non-donor-specific impact than 1$ 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 et al., 1998).

Nevertheless, our assumption should hold for two reasons. First, in their review of 45 papers empirically testing the effectiveness of bilateral and multilateral aid flows on various development outcomes, Biscaye et al. (2017) study why bilateral and multilateral aid flows may (or may not) have different levels of effectiveness. On the one hand, multilateral aid may be more effective than bilateral aid: it is more likely to be allocated on development considerations, it allows to exercise conditionality more effectively, it is untied and more politically neutral, it enjoys more specialisation and expertise. On the other hand, bilateral aid can be given a more strategic orientation, accountability to individual donors is higher, institutional compatibility may be enhanced between bilateral donors and receiving countries. Biscaye et al. (2017) conclude that there is no consistent evidence on the fact that one aid flow is more effective than the other, which supports our identification strategy.

Second, we study the distributions of both types of aid flows from 1973 to 2010 in appendix, Figure A.3. We see that, although the distribution of bilateral aid (left panel) is quite different from the distribution of multilateral aid (right panel) at the beginning of the period, they tend to become more similar toward the end of the period. For instance, bilateral and multilateral aid are mainly directed toward social infrastructure and services as well as economic infrastructure and services toward the end of the period. In the case of bilateral aid, these sectors account for more than 60% of the total in 2010, and in the case of multilateral aid, these sectors represent between 50 and 60% in 2010. In addition, for both types of aid, we observe than aid directed toward the production sector is continuously decreasing. Overall, these facts are reassuring and further supports our identification strategy.

6 Empirical results

6.1 Main findings

6.1.1 The average impact of aid on migration

Second stage results of our IV strategy are reported in Table 5, columns (1) and (2). In column (1), we reproduce the standard specification used in the literature, in particular the specification proposed by Lanati and Thiele (2018b) and Berthélemy et al. (2009), including the bilateral aid flow from country d to country o ($\text{Aid}_{do,t-1}$) 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 0.43% increase in the reverse bilateral migration rate in the following year. This effect is highly significant. We also find that the effect of the total bilateral aid received by country o is highly significant and amounts to -0.25%.

The main caveat of this specification is that bilateral aid between a country d and a country o is included twice in the model (as $\text{Aid}_{do,t-1}$ and inside $\text{Aid}_{o,t-1}$). In addition, multilateral aid flows are omitted from the specification. In column (2), we report the results of our baseline specification which addresses this caveat (equation 15). We include bilateral aid received by country o from country d and instead of including the total bilateral aid flow received by country o, we include the bilateral aid flow received by country o from all donors but d. This approach is similar to Murat (2020). In addition, we include 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 0.38% increase in the reverse bilateral migration rate which is similar to the results reported in column (1). This effect is significant at the 1% level. The remaining amount of bilateral aid received has a significant impact on the migration rate. We find that a 1% increase in the remaining amount of bilateral aid received by country o generates a 0.16% decrease in the bilateral migration rate. Finally, multilateral aid has a significant impact at the 10% level on the bilateral migration rate. We find that a 1% increase in this type of aid received by country o generates a 0.01% decrease in the bilateral migration rate.

Other covariates exhibit the expected sign and level of significance: distance and GDP in the origin country have a negative impact on migration, while language proximity, colonial ties, GDP in the destination country and the past bilateral migration stock have a positive impact on migration. 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. In each column, the statistic is above the critical value which confirms that our instruments are strong enough predictors of the observed bilateral aid flows.

We report the first stage results obtained from the estimation of equations (16) and (17) in appendix, Table A.2. Columns (1a-1b) show the first stage results of column (1) in Table 5. Similarly, columns (2a-2b) report the first stage results of column (2) in Table 5. For all specifications, we find that the instrumental variable is significantly and positively correlated with the endogenous variable of interest. The correlations among instrumental variables are presented in appendix, Table A.3. Note that the correlation between the two instrumental variables included simultaneously in the specification amounts to 27.8% which is not worrisome in term of multicolinearity.

We report the results of OLS regressions (equation 11) in Table 5, columns (3) and (4), in order to assess the direction of the endogeneity bias. We find that OLS estimates of bilateral aid suffer from a downward bias. In other words, the impact of bilateral aid on the reverse bilateral migration rate is higher when endogeneity is controlled for. The coefficients related to the remaining amount of bilateral aid and to multilateral aid are negative and biased toward zero with respect to the IV-2SLS specification. The significance of the coefficients is unchanged.

Table 5: Baseline specification - Main results

	ln $Mig_{od,t}$			
	(1)	**(2)**	(3)	(4)
ln $Aid_{do,t-1}$	0.4251***	0.3828***	0.1148***	0.1105***
	(0.0387)	(0.0324)	(0.0064)	(0.0062)
ln $Aid_{o,t-1}$	-0.2542***		-0.0599***	
	(0.0315)		(0.0108)	
ln $Aid_{(-d)o,t-1}$		-0.1575***		-0.0484***
		(0.0328)		(0.0077)
ln $Multi_{o,t-1}$		-0.0123*		-0.0108*
		(0.0066)		(0.0055)
ln $Dist_{od}$	-1.0007***	-1.0146***	-1.1897***	-1.1881***
	(0.0452)	(0.0423)	(0.0447)	(0.0443)
$Lang_{od}$	0.4691***	0.4668***	0.6290***	0.6254***
	(0.0533)	(0.0519)	(0.0570)	(0.0568)
Col_{od}	0.6346***	0.6811***	1.1156***	1.1161***
	(0.0811)	(0.0770)	(0.0708)	(0.0707)
ln Mig_stock_1970_{od}	0.1584***	0.1614***	0.2081***	0.2077***
	(0.0120)	(0.0116)	(0.0118)	(0.0118)
ln $GDP_{o,t-1}$	-0.1708***	-0.1750***	-0.2316***	-0.2322***
	(0.0429)	(0.0417)	(0.0384)	(0.0382)
ln $GDP_{d,t-1}$	0.7960***	0.8421***	1.0148***	1.0195***
	(0.2184)	(0.2140)	(0.2049)	(0.2045)
Destination FE	yes	yes	yes	yes
Origin FE	yes	yes	yes	yes
Year FE	yes	yes	yes	yes
Observations	18,922	18,922	18,922	18,922
Estimator	IV-2SLS	IV-2SLS	OLS	OLS
R-squared			0.8069	0.8073
Kleibergen-Paap rk Wald F-Stat.	46.599	62.707		
Stock-Yogo critical value (10% max. IV size)	7.03	7.03		

Note: This table reports IV-2SLS second stage estimations (columns 1-2) and OLS estimations (columns 3-4). Column (2) shows our baseline estimation. ***, ** and * denote significance at the 1%, 5% and 10% level respectively. Standard errors clustered within origin-time and destination-time pairs are reported in parentheses.

6.1.2 Transmission channels

We now turn to the estimation of the transmission channels. Baseline results are reported in the first part of Table 6 (panel A). We find weak evidence for a development channel which is identified by the coefficient associated to multilateral aid (β_3). Note that this coefficient is obtained from the baseline estimation (Table 5, column 2). This result implies either that a development channel is at play while no credit constraint channel is at play, or that the development channel more than compensates the credit constraint channel.

We then follow the strategy described in subsection 5.3 to estimate the donor-specific channels that we report in the last two columns of Table 6. For each of these coefficients, we bootstrap the statistics by resampling observations (with replacement) from our sample 100 times. Non-parametric bootstrap allows us to compute the standard errors associated to the coefficients and to infer their level of significance. We find a positive and highly significant coefficient associated with the specific effect of donor d. This result indicates that an information channel prevails. A 1% increase in bilateral aid, keeping full aid received as well as the composition of aid received from other donors constant, induces a 0.38% 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 reverse migration rate. Note that the strategy ensures that this increase in bilateral aid did not contribute to an increase in income in the recipient economy since it was exactly compensated by a decrease in multilateral aid. In addition, this coefficient is almost equal to the average effect of bilateral aid found in the baseline specification (Table 5, column 2) which further indicates that the effect of aid conveyed through non-donor-specific channels is minor.

We also find a negative coefficient associated with the specific effect of other donors. This coefficient is highly significant and indicates that a 1% increase in bilateral aid from other donors than d, keeping full aid received constant, induces a 0.15% decrease in the reverse bilateral migration rate. Here again, this implies that the bilateral aid from other donors conveys information decreasing the corresponding bilateral costs of migration to alternative destinations, which in turn diverts migration away from donor d. This result points toward the presence of multilateral resistance to migration. In addition, because the magnitude of the coefficient is close to the average effect of the remaining amount of bilateral aid (Table 5, column 2), we can infer that non-donor-specific channels associated to bilateral aid from other donors only play a minor role.

Finally, we report the estimates for the non-donor-specific and the donor-specific effects of aid obtained from OLS estimations in the second part of Table 6 (panel B). As shown in Table 5, and in line with existing literature, we find some weak evidence for a development channel which is identified by the coefficient associated to multilateral aid (β_3). Then, we find a significant and positive coefficient associated with the specific effect of donor d. Finally, we find a significant and negative coefficient associated with the specific effect of other donors. Overall, we find that bootstrapped OLS estimates related to the donor-specific channels are biased toward zero as compared to bootstrapped estimates obtained from an IV-2SLS strategy.

Table 6: Baseline specification - Transmission channels

	Non-donor-specific channel	Donor-specific channels *specific to donor d*	Donor-specific channels *specific to all donors but d*
	β_3	$\beta_1 - \beta_3\left[\frac{\overline{\text{Aid}}_{do,t-1}}{\text{Multi}_{o,t-1}}\right]$	$\beta_2 - \beta_3\left[\frac{\overline{\text{Aid}}_{(-d)o,t-1}}{\text{Multi}_{o,t-1}}\right]$
Panel A: IV-2SLS			
Coefficient	-0.0123*	0.3830***	-0.1539***
Std. Err.	(0.0066)	(0.0313)	(0.0267)
Observations	18,922	18,922	18,922
Bootstrapped Err.	no	yes	yes
Panel B: OLS			
Coefficient	-0.0108*	0.1111***	-0.0410***
Std. Err.	(0.0055)	(0.0040)	(0.0084)
Observations	18,922	18,922	18,922
Bootstrapped Err.	no	yes	yes

Note: This table reports coefficients associated to the transmission channels. Results reported for panel A are based on the IV-2SLS baseline estimation presented in Table 5, column (2). Results reported for panel B are based on the OLS estimation presented in Table 5, column (4). ***, ** and * denote significance at the 1%, 5% and 10% level respectively.

6.2 Complementary results

We now present a number of complementary results. We start by further investigating the prevalence of the donor-specific effect of aid. We then analyse the effect of aid on migration by income groups of origin countries.

6.2.1 The donor-specific channels

To further investigate the donor-specific effect of aid on migration decisions, we analyse the emigration rate from country o to all destinations but d (that we denote $\text{Mig}_{o(-d),t}$). In doing so, we expect to find similar significance level and sign for the estimated coefficient associated to multilateral aid, which provides information about the prevalence of a non-donor-specific effect of aid. We also expect to find the opposite signs for the estimated coefficients associated to bilateral aid variables than when studying the migration rate from country o to destination d.

First stage results are reported in appendix, Table A.4. Second stage results are reported in Table 7 and are in line with our expectations. We find that bilateral aid from a donor d to a country o has a negative and highly significant impact on the emigration rate from country o to all destinations but d. This result points toward the fact that a development and/or an information channel (specific to donor d) prevail over other channels. On the contrary, the amount of aid received by country o from all donors but d has a positive and significant impact. Here again, the sign of this coefficient points toward the fact that a budget constraint and/or an information channel (specific to all donors but d) prevail over other channels. Finally, multilateral aid has a negative and highly significant impact on this emigration rate, which suggests that a development channel prevails over a credit constraint channel. Nonetheless, the magnitude of this coefficient remains small: a 1% increase in multilateral aid decreases migration from country o to all countries but country d by 0.04%.

Estimates for the transmission channels are reported in Table 8. This set of results corroborates that the origin of aid matters in individuals' location choices. In the baseline specification (Table 5), we show that the larger the amount of aid donated by a country d, the larger the migration rate toward this country. In Table 7, we provide evidence for the existence of a diversion effect as the larger the amount of aid donated by country d, the smaller the migration rate toward other countries. In Table 8, we confirm that a donor-specific information channel is at play: both coefficients associated to the effect specific to donor d as well as to all donors but d are highly significant and exhibit the expected signs.

6.2.2 Heterogeneity across development level

In line with the literature, we now investigate whether the impact of aid on migration may be conditioned by the level of development of the aid recipient country. In addition, 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 et al., 2015), our baseline model does not allow us to include these fixed effects and may therefore suffer from a specification bias.

To do so, we approximate the level of development by the level of aggregate income *i.e.* the (log) average of the GDP of country o over the sample period ($\ln \overline{\text{GDP}}_o$). First, we adopt an interaction strategy. This first approach is in line with Murat (2020). In our specification, instrumental variables for the interaction of an aid variable with $\ln \overline{\text{GDP}}_o$ are made of the interaction of the corresponding shift-share instrument with $\ln \overline{\text{GDP}}_o$. Second, we split our sample of observations into two sub-samples: origin countries with an average GDP below the median and those with an average GDP above the median[18]. This second method is in line with Lanati and Thiele (2018b).

[18] We do not use the classification of countries by income groups proposed by the World Bank because most origin countries are low and middle income countries in our sample. Therefore, this classification would not allow us to explore the variations in the impact of aid across income groups in a satisfactory manner.

Table 7: The donor-specific channels - Main results

	$\ln \text{Mig}_{o(-d),t}$
	(1)
$\ln \text{Aid}_{do,t-1}$	-0.0857***
	(0.0162)
$\ln \text{Aid}_{(-d)o,t-1}$	0.1855***
	(0.0306)
$\ln \text{Multi}_{o,t-1}$	-0.0367***
	(0.0058)
Controls (Γ)	yes
Destination FE	yes
Origin FE	yes
Year FE	yes
Observations	19,279
Estimator	IV-2SLS
Kleibergen-Paap rk Wald F-Stat.	62.244
Stock-Yogo critical value (10% max. IV size)	7.03

Note: This table reports IV-2SLS second stage estimations. ***, ** and * denote significance at the 1%, 5% and 10% level respectively. Standard errors clustered within origin-time and destination-time pairs are reported in parentheses.

Table 8: The donor-specific channels - Transmission channels

	Non-donor-specific channel	Donor-specific channels	
		specific to donor d	*specific to all donors but d*
	β_3	$\beta_1 - \beta_3\left[\frac{\overline{\text{Aid}_{do,t-1}}}{\text{Multi}_{o,t-1}}\right]$	$\beta_2 - \beta_3\left[\frac{\overline{\text{Aid}_{(-d)o,t-1}}}{\text{Multi}_{o,t-1}}\right]$
Coefficient	-0.0367***	-0.0851***	0.1961***
Std. Err.	(0.0058)	(0.0154)	(0.0300)
Observations	19,279	19,279	19,279
Bootstrapped Err.	no	yes	yes

Note: This table reports coefficients associated to the transmission channels. Results are based on the IV-2SLS estimation presented in Table 7, column (1). ***, ** and * denote significance at the 1%, 5% and 10% level respectively.

First stage results are reported in appendix, Table A.5. Second stage results are reported in Table 9. In column (1), we report the results for the full sample. This model includes the interaction of each aid variable with the income level of the origin country ($\ln \overline{\text{GDP}}_o$). First, we find that the effect of bilateral aid from country d to country o decreases with income in country o: the higher the development level of the receiving country, the lower the impact of bilateral aid on reverse migration. Then, the coefficient associated to the remaining amount of bilateral aid as well as its corresponding interaction term are not significant. Finally, regarding multilateral aid, the unconditional term is highly significant and negative, while the corresponding interaction term is highly significant and positive. Therefore, we can infer that multilateral aid received by country o deters migration from country o to country d, but less as income in country o increases. This result provides strong evidence that a development channel is at play for the poorest countries.

In columns (2) and (3), we further investigate the non-linearity of the relationship by distinguishing countries with an average GDP below and above the median. Looking at results across columns (2-3), we find that bilateral aid from country d to country o has a significant and positive impact on reverse migration in both groups of countries, and that this impact is higher for the poorest countries, which is coherent with the results shown in column (1). Then, we find a weak negative effect of the remaining amount of aid for the poorest countries, and a highly significant and negative effect for countries with an average GDP above the median. There seems to be a diversion effect for the richest countries of the sample: for these countries, aid given by other donor countries has a negative impact on migration to donor country d. Finally, we find a negative and highly significant effect of multilateral aid only for the poorest countries, which is also coherent with the results of column (1).

Estimates for the transmission channels for the two sub-samples are reported in Table 10. We find a positive and highly significant coefficient associated with the information channel specific to the donor country for both groups of countries. However, the magnitude of the effect is larger for the poorest countries. In addition, we find that the coefficient associated with the information channel specific to all donors but d is only significant for the richest countries.

Table 9: Heterogeneity across income level - Main results

	ln $\text{Mig}_{od,t}$		
	(1)	(2)	(3)
ln $\text{Aid}_{do,t-1}$	1.6442***	0.5770***	0.1575***
	(0.1485)	(0.0502)	(0.0332)
ln $\text{Aid}_{do,t-1} * \ln \overline{\text{GDP}}_o$	-0.0558***		
	(0.0059)		
ln $\text{Aid}_{(-d)o,t-1}$ ln $\text{Aid}_{(-d)o,t-1}$	0.2307	-0.2061*	-0.0693***
	(0.3808)	(0.1057)	(0.0235)
ln $\text{Aid}_{(-d)o,t-1} * \ln \overline{\text{GDP}}_o$	-0.0141		
	(0.0153)		
ln $\text{Multi}_{o,t-1}$	-0.2565***	-0.0513***	-0.0036
	(0.0826)	(0.0140)	(0.0065)
ln $\text{Multi}_{o,t-1} * \ln \overline{\text{GDP}}_o$	0.0100***		
	(0.0034)		
Controls (Γ)	yes	yes	yes
Destination FE	yes	yes	yes
Origin FE	yes	yes	yes
Year FE	yes	yes	yes
Observations	18,922	8,322	10,600
Sample	All	GDP below med.	GDP above med.
Estimator	IV-2SLS	IV-2SLS	IV-2SLS
Kleibergen-Paap rk Wald F-Stat.	31.275	70.166	51.679
Stock-Yogo critical value (10% max. IV size)	na	7.03	7.03

Note: This table reports IV-2SLS second stage estimations. ***, ** and * denote significance at the 1%, 5% and 10% level respectively. Standard errors clustered within origin-time and destination-time pairs are reported in parentheses.

Table 10: Heterogeneity across income level - Transmission channels

	Non-donor-specific channel	Donor-specific channels	
		specific to donor d	*specific to all donors but d*
	β_3	$\beta_1 - \beta_3\left[\frac{\overline{\text{Aid}_{do,t-1}}}{\text{Multi}_{o,t-1}}\right]$	$\beta_2 - \beta_3\left[\frac{\overline{\text{Aid}_{(-d)o,t-1}}}{\text{Multi}_{o,t-1}}\right]$
Panel A: GDP below median			
Coefficient	-0.0513***	0.5822***	-0.1761*
Std. Err.	(0.0140)	(0.0467)	(0.0934)
Observations	8,322	8,322	8,322
Bootstrapped Err.	no	yes	yes
Panel B: GDP above median			
Coefficient	-0.0036	0.1576***	-0.0681***
Std. Err.	(0.0065)	(0.0402)	(0.0248)
Observations	10,600	10,600	10,600
Bootstrapped Err.	no	yes	yes

Note: This table reports coefficients associated to the transmission channels. Results for panel A and panel B are based on the IV-2SLS estimations presented in Table 9, columns (2) and (3). ***, ** and * denote significance at the 1%, 5% and 10% level respectively.

6.3 Validity of the instrumentation strategy

We now investigate the validity of our instrumentation strategy. The main concerns related to the use of shift-share instruments lie in the facts that (i) the initial distribution of aid across sectors and donors could be correlated with some variables affecting subsequent changes in migration decisions, and (ii) the total volume of aid received from *all* donors at time $t-1$ (the shift) could be correlated with the emigration of the recipient country at time t. To address these concerns, we first test the exclusion restriction. Then, we propose alternative instrumental variables. Finally, we address some concerns related to the endogeneity of multilateral aid.

The results are summarised in Table 11. Overall the results presented hereinafter corroborate the baseline findings. We confirm the presence of an information channel specific to the donor country d and to all other donors but d. In addition, we confirm that we find weak evidence of a development effect which, according to previous results, is caused by the income heterogeneity across countries.

6.3.1 Exclusion restriction

First, we test whether the exclusion restriction holds for the set of instruments used in the baseline specification (Table 5, column 2). For the Bartik instruments to be valid, they should be uncorrelated with trends in the migration rate prior to the period of interest. In addition, we want to ensure that the instruments are orthogonal to other variables that could affect simultaneously bilateral aid flows and migration decisions. That being said, the instruments could be correlated

Table 11: Summary of the results

Model			Average effects of bilateral aid		Transmission channels		
Specification	Estimator	Tables	$\ln \text{Aid}_{do,t-1}$	$\ln \text{Aid}_{(-d)o,t-1}$	$\ln \text{Mutli}_{o,t-1}$/non-donor	specific to donor d	specific to all donors but d
			Reference models				
Baseline results	IV-2SLS	5; 6	0.3828***	-0.1575***	-0.0123*	0.3830***	-0.1539***
Baseline results	OLS	5; 6	0.1105***	-0.0484***	-0.0108*	0.1111***	-0.0410***
			Complementary results				
The donor-specific channels - Migration to other countries	IV-2SLS	7; 8	-0.0857***	0.1855***	-0.0367***	-0.0851***	0.1961***
Heterogeneity across income level - GDP below median	IV-2SLS	9; 10	0.5770***	-0.2061*	-0.0513***	0.5822***	-0.1761*
Heterogeneity across income level - GDP above median	IV-2SLS	9; 10	0.1575***	-0.0693***	-0.0036	0.1576***	-0.0681***
			Tests on the validity of the instrumentation strategy				
Change in the shift - Weight of aid in GDP_{o,t_0}	IV-2SLS	A.8; A.9	0.4109***	-0.1340***	-0.0220***	0.4114***	-0.1275***
Change in the shift - Growth rate of aid	IV-2SLS	A.8; A.9	0.4075***	-0.1691***	-0.0113*	0.4077***	-0.1275***
Alternative IVs - Early-impact aid	IV-2SLS	A.11; A.12	0.2702***	-0.1763***	-0.0025	0.2702***	-0.1756***
Alternative IVs - Second & third central moments	IV-2SLS	A.11; A.12	0.1006***	-0.0486***	-0.0101*	0.1049***	-0.0457***
Endogeneity of multilateral aid - IV: Rule of law	IV-2SLS	A.14; A.15	0.5721***	0.0926	-0.6389**	0.5792***	0.3349
			Robustness tests				
Alternative set of FE - Origin, destination, time	IV-2SLS	A.17; A.18	0.4436***	-0.3063***	-0.0136*	0.4438***	-0.3011***
Alternative set of FE - Origin, destination-time	IV-2SLS	A.17; A.18	0.4729***	-0.3102***	-0.0148**	0.4731***	-0.3051***
Alternative level of clustering - No cluster, robust	IV-2SLS	A.20; A.21	0.3828***	-0.1575***	-0.0123*	0.3830***	-0.1539***
Alternative level of clustering - Origin	IV-2SLS	A.20; A.21	0.3828***	-0.1575***	-0.0123	0.3830***	-0.1539***
Alternative level of clustering - Destination	IV-2SLS	A.20; A.21	0.3828***	-0.1575***	-0.0123	0.3830***	-0.1539***
Alternative level of clustering - Origin, destination	IV-2SLS	A.20; A.21	0.3828***	-0.1575***	-0.0123	0.3830***	-0.1539***
Alternative level of clustering - Origin-time	IV-2SLS	A.20; A.21	0.3828***	-0.1575***	-0.0123*	0.3830***	-0.1539***
Alternative level of clustering - Destination-time	IV-2SLS	A.20; A.21	0.3828***	-0.1575***	-0.0123*	0.3830***	-0.1539***
Alternative definition of migrants - Foreign only	IV-2SLS	A.23; A.24	0.3815***	-0.1565***	-0.0126*	0.3817***	-0.1529***
Including null migration rates	PPML	A.23; A.24	0.0665***	-0.0090	-0.0114***	0.0672^{na}	-0.0011^{na}
Including null migration rates	Poisson GMM	A.23; A.24	0.2793***	-0.0971**	-0.0093	0.2799^{na}	-0.0906^{na}
Including null aid flows	IV-2SLS	A.26; A.27	0.4054***	-0.4495***	0.1385***	0.4023***	-0.5568***
Including null aid flows	OLS	A.26; A.27	0.0764***	-0.0447***	-0.0028	0.0766***	-0.0428***
Alternative definition of multilateral aid	IV-2SLS	A.29; A.30	0.2707***	-0.1776***	-0.0263**	0.3067***	4.1027*

Note: This table summarises the main results presented in the paper. ***, ** and * denote significance at the 1%, 5% and 10% level respectively. ^{na} indicates that the level of significance is not available.

with origin specific factors, because they are especially designed to capture the change in the *demand* for aid.

To test this exclusion restriction, we analyse the OLS correlations between the migration rate at the beginning of the period and the trend in the shift-share instrument over the period studied. The first year for which we study the migration rate is 1975 (the first two years of the sample are used to build and lag the IVs). We therefore analyse the correlation between the migration rate in 1975 as well as other variables of interest, and the shift-share instruments over 1975-2010. For instance, let $\triangle_{75-10} \ln IV_{do}$ denote the log-difference of $\ln IV_{do}$ (the difference between $\ln IV_{do}$ in 2010 and in 1975). Then, we adopt an alternative strategy that consists in dividing our sample in two equal sub-periods in order to analyse the correlation between the trend in the migration rate as well as other time-varying variables from 1975 to 1992, and the trend in the shift-share instruments from 1993 to 2010.

Results are reported in appendix, Table A.6. First, we find no significant correlation between the migration rate in 1975 and the trend in the shift-share instruments over the period studied. Dividing the sample into two sub-periods also shows insignificant correlation. Second, we find no significant correlation between other covariates and the trend in the shift-share instruments, except for the GDP in the origin country and the geographic distance between the origin and the destination countries. Third, we find a significant correlation between the distance and the bilateral migration stock in 1970, and the instrument built for the total bilateral aid ($\ln IV_o$). However, we only use this instrument in one regression that consists in reproducing the existing literature. We can therefore conclude that the exclusion restriction holds for our instruments and thus that our instrumental strategy is relevant.

6.3.2 Alternative shifts

We then investigate whether the baseline results are robust to a change in the national component of our shift-share instruments ($S_{o,t}$ in equations 12 and 13). Following Goldsmith-Pinkham et al. (2018), if the exogeneity of the shift-share instrument relies on the shares and not on the shift, then exploiting different sources of variation (*i.e.* changing the shift) should provide similar results.

We first use an alternative set of instrumental variables which consists in weighting the shift-share instruments presented hereinbefore by the weight of aid in the GDP of the recipient country at the beginning of the period ($\text{Aid}_{o,t_0}/\text{GDP}_{o,t_0}$). We thus modify equations (12) and (13) as follows:

$$\text{IV}^{w}_{do,t} = \sum_{s} \frac{\text{Aid}_{do,s,t_0}}{S_{o,t_0}} S_{o,t} \frac{\text{Aid}_{o,t_0}}{\text{GDP}_{o,t_0}} \quad \forall t > t_0 \tag{18}$$

$$\text{IV}^{w}_{(-d)o,t} = \sum_{s} \sum_{d' \neq d} \frac{\text{Aid}_{d'o,s,t_0}}{S_{o,t_0}} S_{o,t} \frac{\text{Aid}_{o,t_0}}{\text{GDP}_{o,t_0}} \quad \forall t > t_0 \tag{19}$$

This strategy however reduces our sample to 17,121 observations due to missing data.

Then, we use the growth rate of $S_{o,t}$ instead of using the variable in level. This approach is more standard in the literature as using the growth rates in flows should further guarantee exogeneity compared to using the levels of the bilateral aid flows. Therefore, we modify equations (12) and (13) as follows:

$$\text{IV}^g_{do,t} = \sum_s \frac{\text{Aid}_{do,s,t_0}}{S_{o,t_0}} \Delta S_o \ \ \forall t > t_0 \tag{20}$$

$$\text{IV}^g_{(-d)o,t} = \sum_s \sum_{d' \neq d} \frac{\text{Aid}_{d'o,s,t_0}}{S_{o,t_0}} \Delta S_o \ \ \forall t > t_0 \tag{21}$$

where ΔS_o denotes the growth rate of the sum of bilateral aid flows received by country o between time $t-1$ and t. Note that we do not use this strategy as our baseline estimation because it reduces the size of our sample to 18,529 observations since our panel data is unbalanced.

First and second stage results are reported in appendix, Tables A.7 and A.8. Whether we use the weight of aid in the GDP of the recipient country (column 1, Table A.8) or the growth rate (column 2, Table A.8), we find that the effect of the bilateral aid donated by a country d to a country o on the reverse migration rate is positive and highly significant, and that the coefficient associated to the remaining amount of bilateral aid donated to country o is negative and highly significant. The effect of the multilateral aid donated to country o is negative in both cases, but highly significant when we use the weight of aid in the GDP of the recipient country, and only significant at the 10% level when we use the growth rate. The estimates for the donor-specific channels are reported in appendix, Table A.9 and exhibit signs and significance level perfectly in line with the baseline results. Overall, this set of results confirms that changing the national component of the shift-share instruments has little impact on the outcome of the empirical exercise.

6.3.3 Alternative instrumental variables

To further ensure the exogeneity of our instrumental variables, we now build shift-share instruments using early-impact aid only, following the classification of aid proposed by Clemens et al. (2012)[19]. We thus exploit the fact that, by definition, there should be no long-lasting effects of early-impact aid and therefore no long-lasting relationship between this aid and migration decisions that could bias our results. Let us denote the two instruments for bilateral early-impact aid and the remaining amount of bilateral early-impact aid by $\text{IV}^e_{do,t}$ and $\text{IV}^e_{(-d)o,t}$ respectively.

We also propose an alternative set of instrumental variables to the Bartik instruments used in the baseline strategy. Following Gamso and Yuldashev (2018a,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 either $\ln \text{Aid}_{do,t-1}$ or $\ln \text{Aid}_{(-d)o,t-1}$. Following Lewbel (1997),

[19]The authors define *early-impact aid* as follows: "[...] budget support or program aid given for any purpose and project aid given for real sector investments for infrastructure or to directly support production in transportation (including roads), communications, energy, banking, agriculture and industry. It excludes any aid flow that clearly and primarily funds an activity whose growth effect might arrive far in the future or not at all [...]".

this strategy can be adopted in an IV-2SLS set-up when no exogenous variable is available. The author shows that the second and higher moments of an endogenous variable in the presence of heteroscedasticity are unrelated to the error term. Therefore, they can be used as instrumental variables in a two stage least square estimation.

First stage results are reported in appendix, Table A.10. The new set of instruments built with early-impact aid adequately predicts the endogenous variables (columns 1a-1b). Results are also as expected regarding the use of the second and third central moments (columns 2a-2b). Depending on the endogenous variable instrumented, either the second or the third moments (denoted by the superscripts $''$ and $'''$ respectively) highly predicts the corresponding endogenous variables. Second stage results are reported in appendix, Table A.11. In column (1), we report the results using early-impact aid to build the Bartik instruments. In column (2), we report the results using the second and third central moments of aid. The coefficients associated to bilateral aid are positive and highly significant in both cases, which corroborates the baseline results. Similarly, the coefficients associated to the remaining amount of bilateral aid are negative and highly significant in both cases, which also corroborates the baseline results. Then, the effect associated to multilateral aid is negative and insignificant in the first column, and negative and significant at the 10% level in column (2), which confirms the weakness of the development channel. Finally, including two instruments for each endogenous variable (in column 2) allows us to test for over-identification. We thus report the p-value of the Hansen J-stat which is higher than the critical value.

The estimates for the channels are reported in appendix, Table A.12. In both panels, the signs and significance of the coefficients associated to 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 as well as to other donors, and shows weak evidence for a development channel.

6.3.4 Endogeneity of multilateral aid

We address the concern that multilateral aid could be endogenous hence biasing our results. Although we argued previously that reverse causality is unlikely, we cannot exclude that migrants in a donor country lobby not only to increase bilateral aid to their origin country but also to increase multilateral aid from their host country, especially since the data on multilateral flows only contain earmarked contributions made by individual donors to multilateral organisations. In addition, a simultaneity bias could be at play if multilateral aid is determined by the same factors that influence individuals' migration choices.

According to Burnside and Dollar (2000) and Ugarte Ontiveros and Verardi (2012), variables that are related to "good policy" can be used to instrument aid. The rationale is that aid is presumably more effectively used in countries with good and efficient governance. This argument is especially valid for the non-donor-specific effects of aid that should be identified by the coefficient associated to multilateral aid. We thus instrument the (log) amount of multilateral aid received by country o at time t using an index (provided by the World Bank) that ranks recipient countries by increasing order of perception of the rule of law at time $t-1$.

First stage results are reported in appendix, Table A.13 and are in line with the baseline estimation. We find that the perception of the rule of law is a good predictor of multilateral aid: an increase in this perception significantly increases the probability to receive aid through a multilateral channel (column 1c). That being said, the perception of the rule of law also has a sizeable impact on the rest of bilateral aid (column 1b), which could introduce multicolinearity in our results. Second stage results are reported in appendix, Table A.14. The coefficients associated to bilateral aid received from a country d exhibit the same sign and significance level than in the baseline specification. The coefficient associated to bilateral aid from other countries is no longer significant. The effect associated to multilateral aid is negative and significant at the 5% level. The estimates for the transmission channels are reported in appendix, Table A.15. While the results corroborate the presence of an information effect specific to the donor country d, they do not confirm the presence of an information effect specific to other donors than d. This could be related to our failure to find an instrumental variable for multilateral aid that would not be correlated with bilateral aid flows from other donors.

6.4 Robustness tests

In this part, we investigate the robustness of the results to the use of alternative specifications, alternative dependent variables and alternative aid variables. The results are summarised in Table 11 and confirm that aid impacts migration through an information channel. The results also confirm the weak presence of a development channel.

6.4.1 Alternative specifications

Structure of fixed effects. We now discuss the validity of the structure of fixed effects imposed in the baseline specification. First stage results are reported in appendix, Table A.16. Second stage results are reported in appendix, Table A.17. In column (1) of Table A.17, we report our preferred specification with destination, origin and year fixed effects using the most restrictive sample (imposed by the model shown in column 4). In column (2), we use destination-year fixed effects instead of destination and year fixed effects. This allows us to better control for omitted variables specific to the destination country. In column (3), we use origin-year fixed effects instead of origin and year fixed effects. As explained by Clemens and Postel (2018), aggregate variables are sometimes measured with some noise in developing countries and controlling for the GDP of country o at time $t-1$ could bias the estimates. In column (4), we use the most intensive set of fixed effects, *i.e.* destination-year and origin-year fixed effects, to fully control for multilateral resistance to migration (Beine et al., 2015) and to further reduce the bias of omitted variables.

In all four specifications, the coefficient associated to bilateral aid remains positive and significant. The coefficient associated to the remaining amount of bilateral aid remains negative in the four specifications; it is significant at the 1% level in columns (1) and (2), significant at the 10% level in column (3) and not significant in column (4). This lack of significance is due to the low variation of this variable in the destination and destination-year dimensions (all the variation being thus captured by the origin-year fixed effect). The effect of multilateral aid remains negative and significant at the 10% and 5% level in columns (1) and (2) respectively. Overall, the stability of the results indicates that changing the structure of fixed effects does not alter our findings. The estimates for the transmission channels are reported in appendix, Table A.18. Note that we can estimate the transmission channels only for specifications which include multilateral aid (columns 1 and 2 of Table A.17). The results are perfectly in line with the baseline estimates.

Level of clustering. We then discuss the validity of the level of clustering chosen for the baseline specification. We report the first stage results in appendix, Table A.19 and the second stage results in appendix, Table A.20. In Table A.20, column (1), robust standard errors are not clustered. In columns (2) and (3), errors are clustered at the origin and destination level respectively. In columns (4), errors are clustered within the origin *and* the destination dimensions. In columns (5) and (6), errors are clusters at the origin-time and destination-time level respectively. These specifications can be compared to the baseline specification presented in Table 5, column (2), in which errors are clustered within the origin-time *and* the destination-time dimensions. This set of results shows that our results are rather insensitive to the level of clustering. Only multilateral aid losses significance in columns (2) to (4). The estimates for the transmission channels are reported in appendix, Table A.21. Results obtained for the donor-specific channels are perfectly in line with the baseline estimates.

6.4.2 Alternative dependent variables

Alternative definition of migrant individuals. We start by using a more restrictive, yet more homogeneous, definition of migrant individuals. Until now, we built the variable measuring migration flows with a combination of two definitions: flows of foreign individuals only for countries giving this information, and flows of foreign and national individuals for other countries. We now exclusively study flows of *foreign* individuals from the DEMIG-C2C dataset in order to exclude bilateral flows including return migrants. In doing so, we reduce our sample by 106 origin-destination-year observations (0.56% of the baseline sample). We denote the corresponding migration rate by $\text{Mig}^{f}_{od,t}$.

First stage results are reported in appendix, Table A.22, and second stage results in appendix, Table A.23, column (1). All results are fully in line with the baseline estimates. The results for the transmission channels are reported in Table A.24, panel A. Here again, the sign and level of significance of the coefficients are in line with the baseline estimation. We find weak evidence for a development channel, and significant donor-specific effects of aid conveyed through information.

Including null migration rates. We then address the concern related to the use of a linear estimator to analyse migration rates. So far, we have analysed the logarithm of the migration rate as the dependent variable using a linear estimator, which has led us to exclude null migration rates from our sample. In this robustness test, we no longer log-transform the migration rate and use a PPML and a Poisson GMM model. In doing so, we keep null observations and increase our sample size by 379 observations and reduce the bias that may be induced by the omission of these null migration rates.

Results are presented in appendix, Table A.23, columns (2) and (3). In column (2), we report the results using a PPML model. These results can be compared to the OLS specification shown in Table 5, column (4). We find that a 1% increase in the bilateral aid induces the reverse bilateral migration rate to increase by 0.0006 point in the following year. We find no significant effect of the remaining amount of bilateral aid. The effect of multilateral aid is positive and highly significant: a 1% increase in multilateral aid induces the reverse bilateral migration rate to decrease by 0.0001 point. In column (3), we account for endogeneity using a Poisson GMM model. These results can be compared to the OLS specification shown in Table 5, column (2). We find that a 1% increase in the bilateral aid induces the reverse bilateral migration rate to increase by 0.0028 point in the following year. The effect of the remaining amount of bilateral aid is negative and significant at the 5% level. Finally, multilateral aid is no longer significant, we therefore find no evidence for a development channel under this specification.

The corresponding results for the transmission channels are reported in Table A.24, panels B and C. Note that we do not report the standard errors nor the level of significance for the estimates of the donor-specific channels as bootstrapping a PPML or a Poisson GMM model is computationally too intensive. Nonetheless, the sign of the coefficients are in line with the baseline results.

6.4.3 Alternative aid variables

Including null aid flows. We now address the concern that one could have regarding our decision to leave missing aid flows as such. In doing so, we analyse the impact of aid on migration *conditional* on receiving aid. A number of available studies, however, replace missing aid flows by zeros. We therefore build an alternative sample in which we include zero aid flows. More precisely, we consider donor-recipient pairs that appear at least two years in AidData. For each country pair, we replace missing values by zeros between the first and the last year for which we observe the pair (and thus for which a positive bilateral aid flow has been recorded). This enables us to increase our sample by 4,842 observations. Because we now consider null bilateral aid flows, we increase these flows by one before log-transforming them.

First stage results are presented in appendix, Table A.25. These results show that our instrumentation strategy adequately predicts the endogenous aid flows. Second stage results are reported in appendix, Table A.26, column (1). Results about the impact of bilateral aid flows are in line with our baseline results. However, we find that including null aid flows strongly alters the coefficient associated with multilateral aid. The coefficient is now highly significant and positive which points toward the prevalence of a credit constraint channel. This is the only time we find such a result; in all the other estimations, there is evidence of the prevalence of a weak development channel (see Table 11). In column (2), we report the OLS results obtained with this larger sample in order to better compare our results to those obtained with the baseline sample and shown in Table 5, column (4) as well as to compare our results to the literature (see Table 2). Results are in line with the baseline OLS estimation. The estimates for the transmission channels including null aid flows are reported in appendix, Table A.27. Here again, we find significant donor-specific effects conveyed through information, which corroborates the baseline findings.

Alternative definition of multilateral aid. Finally, as our strategy relies on the identification of multilateral aid flows as compared to bilateral aid flows, we now explore an alternative definition of multilateral aid. More precisely, we use the variable "Multi-bi Flows" which is part of the DAC-CRS codes provided by the OECD. This variable is included in AidData and allows one to identify bilateral flows (coded by 1, 3, 6, 7 and 8) and multilateral flows (coded by 2 and 4)[20]. The inconvenience of this classification of aid flows is that the variable "Multi-bi Flows" is missing for a lot of observations recorded in AidData. Thus, using this alternative definition reduces our sample to 9,679 observations and our sample period to 1999-2010.

First stage results are reported in appendix, Table A.28, and second stage results in appendix, Table A.29. Despite the small number of observations, all results are fully in line with the baseline estimates. The results for the transmission channels are reported in Table A.30. Here again, the sign and level of significance of the coefficients are quite in line with the baseline estimation. We find evidence for a development channel (at the 5% level). We also find a significant effect of aid channelled through information specific to a donor d. Regarding the effect specific to all donors but d, we find a positive coefficient significant at the 10% level only, which would point toward a weak prevalence of an instrumentation channel. This last result is, however, unique among all the others pointing toward the strong prevalence of an information channel (see Table 11).

7 Conclusion

In this paper, we revisited the aid-migration nexus. We explained that the question of whether aid decreases or increases migration and through which channels is rather unclear. While some

[20]For more details, see http://www.oecd.org/development/financing-sustainable-development/development-finance-standards/dacandcrscodelists.htm.

studies find evidence that aid from one country to another reduces emigration because a development effect prevails, other studies find evidence that aid lowers the migration costs and alleviates the credit constraints of would-be migrants, which increases total emigration as well as emigration to the donor country. We argued that this tension in the literature eventually reflects a failure to neatly disentangle non-donor-specific effects (development and credit constraint channels) from donor-specific effects (information and instrumentation channels) through which aid effectively affects migration flows. We therefore proposed a theoretically-founded strategy to address this caveat of the literature.

First, we built a random utility maximisation model of migration and derived a gravity model describing the relationship between bilateral migration and aid. Second, using DEMIG-C2C and AidData from 1973 to 2010, we estimated this model with an IV-2SLS strategy and a shift-share instrument. More precisely, we estimated the impact of aid from a donor to a recipient country on the reverse bilateral migration rates (conditional on receiving aid), as well as the impacts of remaining bilateral aid and multilateral aid received by the country. We assumed that the coefficient associated with multilateral aid only relates to a non-donor-specific effect of aid. We then used this estimate to identify the transmission channels.

We found that aid from a donor country to a recipient country has overall a highly positive impact on the rate of migration taking place in the reverse direction: a 1% increase in the bilateral aid flow induces a 0.38% increase in the reverse bilateral migration rate. We also found that remaining bilateral aid has a negative impact on this migration rate, while multilateral aid has a weak negative impact. We then analysed the channels through which these effects are conveyed. First, we found strong evidence that the effect of aid on migration is conveyed through a positive donor-specific effect: the information channel prevails over the instrumentation channel (if any). The magnitude of this effect is larger for the poorest aid recipient countries of our sample. Second, there seems to be a weak non-donor-specific channel at play: we found weak evidence for a negative non-donor-specific effect, suggesting that a development channel may prevail over a credit constraint effect (if any). Our results emphasise the importance of differentiating donor-specific from non-donor-specific effects of development aid on migration to neatly interpret the results one can derive from a gravity-type analysis.

From a policy perspective, our results suggest that bilateral development 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 recipient country while keeping constant the amount of development aid given to that country, more should be allocated to multilateral aid than to bilateral aid: according to our results, this would reduce immigration from that country (through the development channel, and a decrease in the information channel). There could also be strategic interactions between donors to the same recipient countries, since any donor country wishing to decrease immigration flows should try to decrease its bilateral aid to the origin countries of immigrants and hope that other countries would increase their contributions to these countries. These interactions could be studied in further research.

Contrary to recent results on the aid-migration nexus but in line with the literature analysing the impact of aid on growth in recipient countries (Burnside and Dollar, 2000; Clemens et al., 2012), we do not find strong evidence that a development channel is at play. This may imply that development aid does not reach amounts high enough to tackle the fundamental causes of migration. Whether *targeted* aid – as promoted by the European Commission[21] – could be more helpful to address migration causes still needs to be carefully examined.

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[21]For more information on the European policy for the period 2016-2020, see the fact-sheet "Partnership Framework on Migration one year on: Lessons learned, challenges and way forward". `https://eeas.europa.eu/sites/eeas/files/factsheet_partnership_framework_on_migration.pdf`

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A Appendix

A.1 Additional descriptive statistics

Figure A.1: Distribution of observations over time

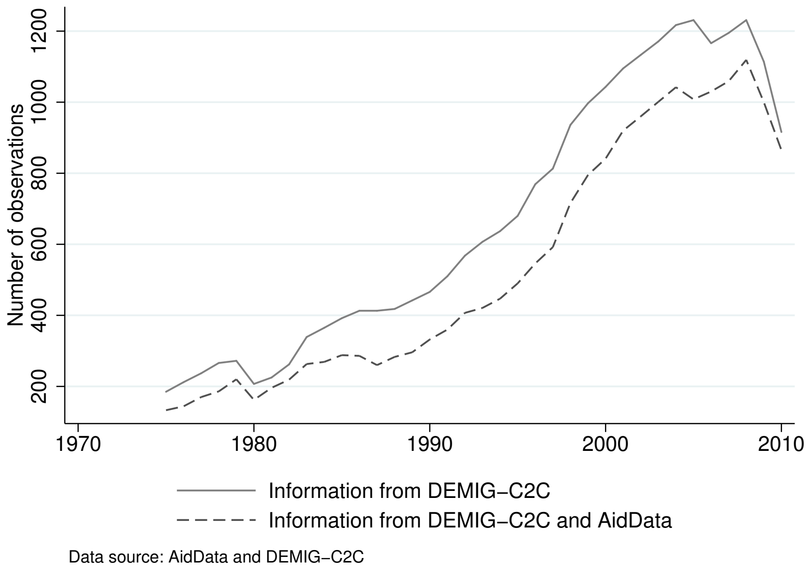


Figure A.2: Density of bilateral migration rates

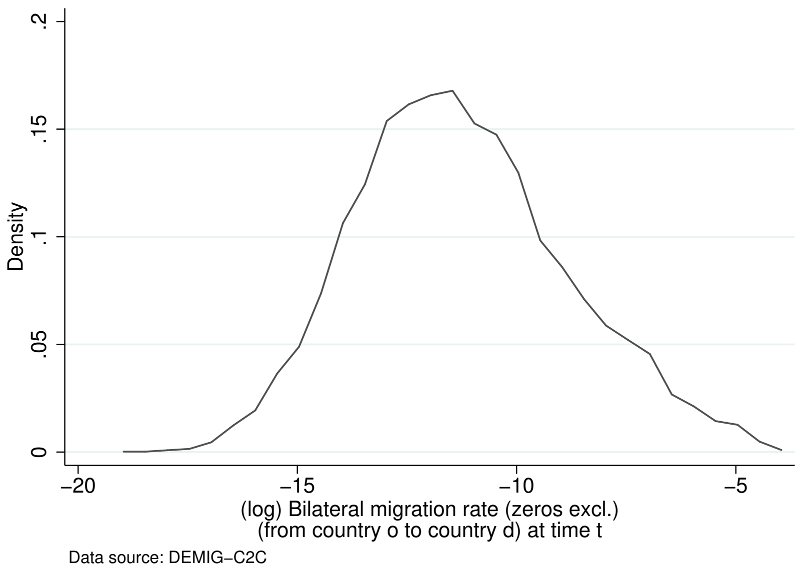
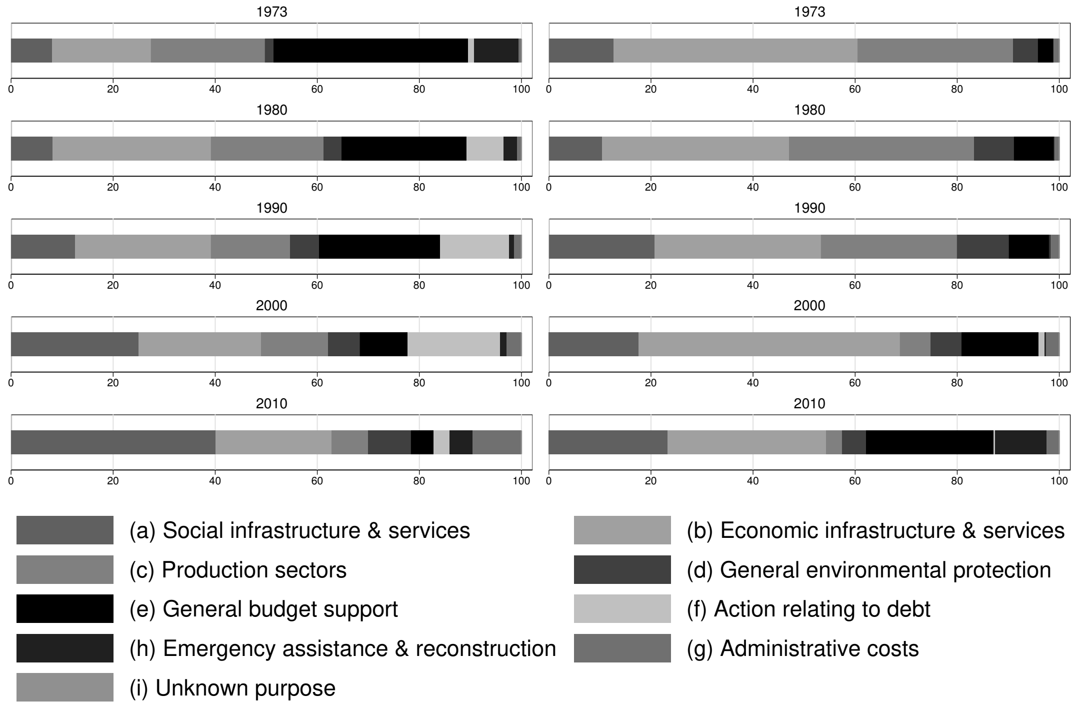


Figure A.3: Distribution of bilateral and multilateral aid across sectors from 1973 to 2010



Data source: AidData
Note: Bilateral aid is shown on the left panel. Multilateral aid is shown on the right panel.

Table A.1: Correlation matrix - Variables of interest

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) ln $\text{Mig}_{od,t}$	1										
(2) ln $\text{Aid}_{do,t-1}$	0.288***	1									
(3) ln $\text{Aid}_{o,t-1}$	-0.293***	0.360***	1								
(4) ln $\text{Aid}_{(-d)o,t-1}$	-0.331***	0.150***	0.804***	1							
(5) ln $\text{Multi}_{o,t-1}$	-0.177***	0.107***	0.445***	0.534***	1						
(6) ln $\text{Mig\_stock\_1970}_{od}$	0.594***	0.491***	0.165***	-0.00742	0.0625***	1					
(7) ln Dist_{od}	-0.267***	0.0645***	0.128***	0.103***	0.001	-0.138***	1				
(8) Lang_{od}	0.413***	0.199***	-0.123***	-0.185***	-0.0813***	0.340***	0.0383***	1			
(9) ln Col_{od}	0.211***	0.198***	-0.0349***	-0.0530***	-0.00799	0.225***	-0.0455***	0.330***	1		
(10) ln $\text{GDP}_{o,t-1}$	-0.179***	0.0850***	0.495***	0.341***	0.274***	0.346***	-0.0186**	-0.142***	-0.0547***	1	
(11) ln $\text{GDP}_{d,t-1}$	0.562***	0.385***	-0.132***	-0.201***	-0.0933***	0.472***	0.118***	0.241***	0.0605***	-0.0361***	1

Note: This table reports 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.

A.2 Main findings - Additional tables

Table A.2: Baseline specification - First stage results

	ln $\text{Aid}_{do,t-1}$	ln $\text{Aid}_{o,t-1}$	ln $\text{Aid}_{do,t-1}$	ln $\text{Aid}_{(-d)o,t-1}$
	(1a)	(1b)	(2a)	(2b)
ln $\text{IV}_{do,t-1}$	0.0688***	0.0024***	0.0865***	0.0305***
	(0.0070)	(0.0006)	(0.0079)	(0.0032)
ln $\text{IV}_{o,t-1}$	0.3274***	0.5755***		
	(0.0361)	(0.0415)		
ln $\text{IV}_{(-d)o,t-1}$			0.0035	0.1400***
			(0.0069)	(0.0093)
ln $\text{Multi}_{o,t-1}$			0.0564***	0.1042***
			(0.0081)	(0.0111)
ln Dist_{od}	-0.5280***	0.0235**	-0.4975***	0.0797*
	(0.0755)	(0.0110)	(0.0765)	(0.0411)
Lang_{od}	0.5599***	0.0231**	0.5607***	-0.0969***
	(0.0630)	(0.0109)	(0.0620)	(0.0250)
Col_{od}	1.4120***	-0.0532***	1.4016***	-0.1889***
	(0.0991)	(0.0154)	(0.0987)	(0.0382)
ln $\text{Mig\_stock\_1970}_{od}$	0.1427***	-0.0006	0.1396***	-0.0276***
	(0.0142)	(0.0021)	(0.0147)	(0.0058)
ln $\text{GDP}_{o,t-1}$	-0.1594***	0.0510**	-0.2157***	-0.0122
	(0.0517)	(0.0242)	(0.0566)	(0.0486)
ln $\text{GDP}_{d,t-1}$	0.5807**	-0.0316	0.5126**	-0.1664**
	(0.2292)	(0.0275)	(0.2346)	(0.0683)
Destination FE	yes	yes	yes	yes
Origin FE	yes	yes	yes	yes
Year FE	yes	yes	yes	yes
Observations	18,922	18,922	18,922	18,922
Estimator	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS

Note: This table reports IV-2SLS first stage estimations associated to Table 5. ***, ** and * denote significance at the 1%, 5% and 10% level respectively. Standard errors clustered within origin-time and destination-time pairs are reported in parentheses.

Table A.3: Correlation matrix - Instrumental variables

	(1)	(2)	(3)
(1) ln $IV_{do,t-1}$	1		
(2) ln $IV_{o,t-1}$	0.278***	1	
(3) ln $IV_{(-d)o,t-1}$	0.070***	0.706***	1

Note: This table reports correlation coefficients between the instrumental variables used in the empirical analysis. ***, ** and * denote significance at the 1%, 5% and 10% level respectively.

A.3 Complementary results - Additional tables

Table A.4: The donor-specific channels - First stage results

	ln $Aid_{do,t-1}$	ln $Aid_{(-d)o,t-1}$
	(1a)	(1b)
ln $IV_{do,t-1}$	0.0855***	0.0298***
	(0.0079)	(0.0032)
ln $IV_{(-d)o,t-1}$	0.0025	0.1344***
	(0.0068)	(0.0090)
Controls (Γ)	yes	yes
Destination FE	yes	yes
Year FE	yes	yes
Origin FE	yes	yes
Observations	19,279	19,279
Estimator	IV-2SLS	IV-2SLS

Note: This table reports IV-2SLS first stage estimations associated to Table 7. ***, ** and * denote significance at the 1%, 5% and 10% level respectively. Standard errors clustered within origin-time and destination-time pairs are reported in parentheses.

Table A.5: Heterogeneity across income level - First stage results

	$\ln \text{Aid}_{do,t-1}$	$\ln \text{Aid}_{(-d)o,t-1}$	$\ln \text{Aid}_{do,t-1} * \ln \overline{\text{GDP}}_o$	$\ln \text{Aid}_{(-d)o,t-1} * \ln \overline{\text{GDP}}_o$	$\ln \text{Aid}_{do,t-1}$	$\ln \text{Aid}_{(-d)o,t-1}$	$\ln \text{Aid}_{do,t-1}$	$\ln \text{Aid}_{(-d)o,t-1}$
	(1a)	(1b)	(1c)	(1d)	(2a)	(2b)	(3a)	(3b)
$\ln \text{IV}_{do,t-1}$	-0.2573***	-0.0919***	-11.4085***	-2.6282***	0.0928***	0.0239***	0.0800***	0.0329***
	(0.0578)	(0.0306)	(1.3455)	(0.7811)	(0.0097)	(0.0029)	(0.0076)	(0.0039)
$\ln \text{IV}_{do,t-1} * \overline{\text{GDP}}_o$	0.0149***	0.0052***	0.5811***	0.1431***				
	(0.0025)	(0.0014)	(0.0599)	(0.0352)				
$\ln \text{IV}_{(-d)o,t-1}$	-0.3453***	-0.6409***	-6.4161***	-18.0503***	-0.0230***	0.0623***	0.0316***	0.2204***
	(0.0774)	(0.0799)	(1.7897)	(2.0934)	(0.0084)	(0.0064)	(0.0092)	(0.0156)
$\ln \text{IV}_{(-d)o,t-1} * \overline{\text{GDP}}_o$	0.0153***	0.0346***	0.2888***	0.9458***				
	(0.0034)	(0.0038)	(0.0787)	(0.0988)				
Controls (Γ)	yes	yes	yes	yes	yes	yes	yes	yes
Destination FE	yes	yes	yes	yes	yes	yes	yes	yes
Origin FE	yes	yes	yes	yes	yes	yes	yes	yes
Year FE	yes	yes	yes	yes	yes	yes	yes	yes
Observations	18,922	18,922	18,922	18,922	8,322	8,322	10,600	10,600
Sample	all	all	all	all	below med.	below med.	above med.	above med.
Estimator	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS

Note: This table reports IV-2SLS first stage estimations associated to Table 9. ***, ** and * denote significance at the 1%, 5% and 10% level respectively. Standard errors clustered within origin-time and destination-time pairs are reported in parentheses.

A.4 Validity of the instrumentation strategy - Additional tables

Table A.6: Testing the exclusion restriction assumption

	$\triangle_{75-10} \ln \mathrm{IV}_{do}$	$\triangle_{75-10} \ln \mathrm{IV}_{(-d)o}$	$\triangle_{75-10} \ln \mathrm{IV}_{o}$
$\ln \mathrm{Mig}_{od,75}$	0.0774	0.5575	-0.0494
	(0.0701)	(0.3541)	(0.0618)
	[73]	[73]	[139]
$\ln \mathrm{GDP}_{o,75}$	-0.2709**	-1.5226***	-0.2169
	(0.1142)	(0.4891)	(0.1489)
	[61]	[73]	[64]
$\ln \mathrm{GDP}_{d,75}$	0.1556	1.0877	-0.0351
	(0.1593)	(0.8074)	(0.0896)
	[73]	[73]	[333]
$\ln \mathrm{Dist}_{od}$	-0.4378	-3.0685**	-0.2189*
	(0.2868)	(1.4408)	(0.1239)
	[73]	[73]	[736]
Lang_{od}	-0.2241	2.2761	0.0528
	(0.3527)	(1.6815)	(0.3547)
	[66]	[73]	[112]
Col_{od}	1.0435	4.5268	0.4443
	(0.8140)	(3.9491)	(0.3671)
	[61]	[73]	[100]
$\ln \mathrm{Mig\_stock\_1970}_{od}$	-0.0132	-0.0571	-0.0802***
	(0.0585)	(0.2985)	(0.0245)
	[73]	[73]	[656]

	$\triangle_{93-10} \ln \mathrm{IV}_{do}$	$\triangle_{93-10} \ln \mathrm{IV}_{(-d)o}$	$\triangle_{93-10} \ln \mathrm{IV}_{o}$
$\triangle_{75-92} \ln \mathrm{Mig}_{od}$	0.1238	-0.3670	0.1051
	(0.1154)	(0.3973)	(0.1698)
	[82]	[82]	[95]
$\triangle_{75-92} \ln \mathrm{GDP}_{o}$	-0.4845**	-1.0378**	-1.0650**
	(0.1928)	(0.4113)	(0.4269)
	[108]	[178]	[66]
$\triangle_{75-92} \ln \mathrm{GDP}_{d}$	-0.4262	-1.7087	0.0713
	(1.0590)	(2.7848)	(1.1559)
	[151]	[167]	[398]

Note: This table reports OLS correlations. ***, ** and * denote significance at the 1%, 5% and 10% level respectively. Standard errors are reported in parentheses. The number of observations is reported in brackets.

Table A.7: Change in the shift - First stage results

	$\ln \text{Aid}_{do,t-1}$	$\ln \text{Aid}_{(-d)o,t-1}$	$\ln \text{Aid}_{do,t-1}$	$\ln \text{Aid}_{(-d)o,t-1}$
	(1a)	(1b)	(2a)	(2b)
$\ln \text{IV}^{w}_{do,t-1}$	0.0803***	0.0277***		
	(0.0080)	(0.0031)		
$\ln \text{IV}^{w}_{(-d)o,t-1}$	0.0037	0.1034***		
	(0.0061)	(0.0080)		
$\ln \text{IV}^{g}_{do,t-1}$			0.1154***	0.0475***
			(0.0095)	(0.0042)
$\ln \text{IV}^{g}_{(-d)o,t-1}$			0.0184**	0.1677***
			(0.0078)	(0.0101)
Controls (Γ)	yes	yes	yes	yes
Destination FE	yes	yes	yes	yes
Origin FE	yes	yes	yes	yes
Year FE	yes	yes	yes	yes
Observations	17,121	17,121	18,529	18,529
Estimator	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS

Note: This table reports IV-2SLS first stage estimations associated to Table A.8. ***, ** and * denote significance at the 1%, 5% and 10% level respectively. Standard errors clustered within origin-time and destination-time pairs are reported in parentheses.

Table A.8: Change in the shift - Main results

	ln $\text{Mig}_{od,t}$	
	(1)	(2)
ln $\text{Aid}_{do,t-1}$	0.4109***	0.4075***
	(0.0364)	(0.0320)
ln $\text{Aid}_{(-d)o,t-1}$	-0.1340***	-0.1691***
	(0.0390)	(0.0347)
ln $\text{Multi}_{o,t-1}$	-0.0220***	-0.0113*
	(0.0076)	(0.0066)
Controls (Γ)	yes	yes
Destination FE	yes	yes
Origin FE	yes	yes
Year FE	yes	yes
Observations	17,121	18,529
Estimator	IV-2SLS	IV-2SLS
Kleibergen-Paap rk Wald F-Stat.	57.729	79.633
Stock-Yogo critical value (10% max. IV size)	7.03	7.03

Note: This table reports IV-2SLS second stage estimations. ***, ** and * denote significance at the 1%, 5% and 10% level respectively. Standard errors clustered within origin-time and destination-time pairs are reported in parentheses.

Table A.9: Change in the shift - Transmission channels

	Non-donor-specific channel	Donor-specific channels	
		specific to donor d	*specific to all donors but d*
	β_3	$\beta_1 - \beta_3\left[\frac{\overline{\text{Aid}_{do,t-1}}}{\text{Multi}_{o,t-1}}\right]$	$\beta_2 - \beta_3\left[\frac{\overline{\text{Aid}_{(-d)o,t-1}}}{\text{Multi}_{o,t-1}}\right]$
Panel A: Weight of aid in GDP_{o,t_0}			
Coefficient	-0.0220***	0.4114***	-0.1275***
Std. Err.	(0.0076)	(0.0353)	(0.0377)
Observations	17,121	17,121	17,121
Bootstrapped Err.	no	yes	yes
Panel B: Growth rate of aid			
Coefficient	-0.0113*	0.4077***	-0.1654***
Std. Err.	(0.0066)	(0.0276)	(0.0259)
Observations	18,529	18,529	18,529
Bootstrapped Err.	no	yes	yes

Note: This table reports coefficients associated to the transmission channels. Results are based on the IV-2SLS estimation presented in Table A.8, column (1). ***, ** and * denote significance at the 1%, 5% and 10% level respectively.

Table A.10: Alternative instrumental variables - First stage results

	$\ln\ \text{Aid}_{do,t-1}$	$\ln\ \text{Aid}_{(-d)o,t-1}$	$\ln\ \text{Aid}_{do,t-1}$	$\ln\ \text{Aid}_{(-d)o,t-1}$
	(1a)	(1b)	(2a)	(2b)
$\ln\ \text{IV}^e_{do,t-1}$	0.0475***	0.0110***		
	(0.0025)	(0.0013)		
$\ln\ \text{IV}^e_{(-d)o,t-1}$	0.0177***	0.0760***		
	(0.0040)	(0.0039)		
$[\ln \text{IV}_{do,t-1}]''$			0.0156***	0.0012
			(0.0023)	(0.0015)
$[\ln \text{IV}_{do,t-1}]'''$			0.0229***	0.0007***
			(0.0012)	(0.0002)
$\left[\ln \text{IV}_{(-d)o,t-1}\right]''$			0.0092**	-0.0653***
			(0.0046)	(0.0113)
$\left[\ln \text{IV}_{(-d)o,t-1}\right]'''$			0.0004*	-0.0010*
			(0.0002)	(0.0006)
Controls (Γ)	yes	yes	yes	yes
Destination FE	yes	yes	yes	yes
Origin FE	yes	yes	yes	yes
Year FE	yes	yes	yes	yes
Observations	18,922	18,922	18,922	18,922
Estimator	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS

Note: This table reports IV-2SLS first stage estimations associated to Table A.11. ***, ** and * denote significance at the 1%, 5% and 10% level respectively. Standard errors clustered within origin-time and destination-time pairs are reported in parentheses.

Table A.11: Alternative instrumental variables - Main results

	ln $\text{Mig}_{od,t}$	
	(1)	(2)
ln $\text{Aid}_{do,t-1}$	0.2702***	0.1006***
	(0.0232)	(0.0082)
ln $\text{Aid}_{(-d)o,t-1}$	-0.1763***	-0.0486***
	(0.0328)	(0.0124)
ln $\text{Multi}_{o,t-1}$	-0.0025	-0.0101*
	(0.0071)	(0.0058)
Controls (Γ)	yes	yes
Destination FE	yes	yes
Year FE	yes	yes
Origin FE	yes	yes
Observations	18,922	18,922
Estimator	IV-2SLS	IV-2SLS
Kleibergen-Paap rk Wald F-Stat.	160.276	379.930
Stock-Yogo critical value (10% max. IV size)	7.03	16.87
Hansen J-stat (p-value)		0.2552

Note: This table reports IV-2SLS second stage estimations. ***, ** and * denote significance at the 1%, 5% and 10% level respectively. Standard errors clustered within origin-time and destination-time pairs are reported in parentheses.

Table A.12: Alternative instrumental variables - Transmission channels

	Non-donor-specific channel	Donor-specific channels	
		specific to donor d	*specific to all donors but d*
	β_3	$\beta_1 - \beta_3\left[\frac{\overline{\text{Aid}_{do,t-1}}}{\text{Multi}_{o,t-1}}\right]$	$\beta_2 - \beta_3\left[\frac{\overline{\text{Aid}_{(-d)o,t-1}}}{\text{Multi}_{o,t-1}}\right]$
Panel A: Early-impact aid			
Coefficient	-0.0025	0.2702***	-0.1756***
Std. Err.	(0.0071)	(0.0230)	(0.0264)
Observations	18,922	18,922	18,922
Bootstrapped Err.	no	yes	yes
Panel B: Second & third central moments			
Coefficient	-0.0101*	0.1049***	-0.0457***
Std. Err.	(0.0058)	(0.0081)	(0.0111)
Observations	18,922	18,922	18,922
Bootstrapped Err.	no	yes	yes

Note: This table reports coefficients associated to the transmission channels. Results reported for panel A and panel B are based on the IV-2SLS estimations presented in Table A.11, columns (1) and (2). ***, ** and * denote significance at the 1%, 5% and 10% level respectively.

Table A.13: Endogeneity of multilateral aid - First stage results

	ln $\text{Aid}_{do,t-1}$	ln $\text{Aid}_{(-d)o,t-1}$	ln $\text{Multi}_{o,t-1}$
	(1a)	(1b)	(1c)
ln $\text{IV}_{do,t-1}$	0.0564***	0.0173***	0.0061***
	(0.0083)	(0.0021)	(0.0021)
ln $\text{IV}_{(-d)o,t-1}$	0.0434*	0.2549***	0.1295***
	(0.0236)	(0.0401)	(0.0364)
Rule of $\text{law}_{o,t-1}$	0.1205	0.2366***	0.5014***
	(0.1176)	(0.0761)	(0.1785)
Controls (Γ)	yes	yes	yes
Destination FE	yes	yes	yes
Origin FE	yes	yes	yes
Year FE	yes	yes	yes
Observations	9,121	9,121	9,121
Estimator	IV-2SLS	IV-2SLS	IV-2SLS

Note: This table reports IV-2SLS first stage estimations associated to Table A.14. ***, ** and * denote significance at the 1%, 5% and 10% level respectively. Standard errors clustered within origin-time and destination-time pairs are reported in parentheses.

Table A.14: Endogeneity of multilateral aid - Main results

	ln $\text{Mig}_{od,t}$
	(1)
ln $\text{Aid}_{do,t-1}$	0.5721***
	(0.0725)
ln $\text{Aid}_{(-d)o,t-1}$	0.0926
	(0.2279)
ln $\text{Multi}_{o,t-1}$	-0.6389**
	(0.3220)
Controls (Γ)	yes
Destination FE	yes
Origin FE	yes
Year FE	yes
Observations	9,121
Estimator	IV-2SLS
Kleibergen-Paap rk Wald F-Stat.	1.790
Stock-Yogo critical value (10% max. IV size)	na

Note: This table reports IV-2SLS second stage estimations. ***, ** and * denote significance at the 1%, 5% and 10% level respectively. Standard errors clustered within origin-time and destination-time pairs are reported in parentheses.

Table A.15: Endogeneity of multilateral aid - Transmission channels

	Non-donor-specific channel	Donor-specific channels *specific to donor d*	Donor-specific channels *specific to all donors but d*
	β_3	$\beta_1 - \beta_3\left[\frac{\overline{\text{Aid}_{do,t-1}}}{\text{Multi}_{o,t-1}}\right]$	$\beta_2 - \beta_3\left[\frac{\overline{\text{Aid}_{(-d)o,t-1}}}{\text{Multi}_{o,t-1}}\right]$
Coefficient	-0.6389**	0.5792***	0.3349
Std. Err.	(0.3220)	(0.0849)	(0.2529)
Observations	9,121	9,121	9,121
Bootstrapped Err.	no	yes	yes

Note: This table reports coefficients associated to the transmission channels. Results are based on the IV-2SLS estimation presented in Table A.14, column (1). ***, ** and * denote significance at the 1%, 5% and 10% level respectively.

A.5 Robustness tests - Additional tables

Table A.16: Alternative set of fixed effects - First stage results

	ln $\text{Aid}_{do,t-1}$	ln $\text{Aid}_{(-d)o,t-1}$	ln $\text{Aid}_{do,t-1}$	ln $\text{Aid}_{(-d)o,t-1}$	ln $\text{Aid}_{do,t-1}$	ln $\text{Aid}_{(-d)o,t-1}$	ln $\text{Aid}_{do,t-1}$	ln $\text{Aid}_{(-d)o,t-1}$
	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)	(4a)	(4b)
ln $\text{IV}_{do,t-1}$	0.0809***	0.0266***	0.0775***	0.0268***	0.0596***	-0.0003	0.0551***	-0.0001
	(0.0074)	(0.0023)	(0.0072)	(0.0023)	(0.0067)	(0.0005)	(0.0066)	(0.0005)
ln $\text{IV}_{(-d)o,t-1}$	0.1276***	0.3030***	0.1234***	0.3032***	-0.0532***	0.0471***	-0.0595***	0.0469***
	(0.0152)	(0.0242)	(0.0152)	(0.0242)	(0.0194)	(0.0082)	(0.0199)	(0.0083)
ln $\text{Multi}_{o,t-1}$	0.0540***	0.0654***	0.0547***	0.0652***				
	(0.0080)	(0.0078)	(0.0084)	(0.0077)				
ln Dist_{od}	-0.5119***	0.0522*	-0.5177***	0.0602**	-0.5387***	0.0327*	-0.5476***	0.0325**
	(0.0788)	(0.0281)	(0.0786)	(0.0278)	(0.0837)	(0.0169)	(0.0828)	(0.0164)
Lang_{od}	0.5815***	-0.1247***	0.5687***	-0.1249***	0.5405***	-0.1458***	0.5248***	-0.1445***
	(0.0634)	(0.0214)	(0.0632)	(0.0215)	(0.0600)	(0.0158)	(0.0593)	(0.0156)
Col_{od}	1.4218***	-0.1610***	1.3972***	-0.1711***	1.4755***	-0.1505***	1.4636***	-0.1539***
	(0.0961)	(0.0274)	(0.0985)	(0.0283)	(0.0933)	(0.0231)	(0.0942)	(0.0246)
ln $\text{Mig\_stock\_1970}_{od}$	0.1412***	-0.0155***	0.1385***	-0.0150***	0.1382***	-0.0197***	0.1343***	-0.0200***
	(0.0137)	(0.0035)	(0.0134)	(0.0035)	(0.0135)	(0.0034)	(0.0132)	(0.0034)
ln $\text{GDP}_{o,t-1}$	-0.1150**	0.0476	-0.1092*	0.0467				
	(0.0565)	(0.0370)	(0.0567)	(0.0369)				
ln $\text{GDP}_{d,t-1}$	0.6338***	-0.2821***			0.7848***	-0.1784***		
	(0.2361)	(0.0436)			(0.2400)	(0.0436)		
Destination FE	yes	yes	no	no	yes	yes	no	no
Origin FE	yes	yes	yes	yes	no	no	no	no
Year FE	yes	yes	no	no	no	no	no	no
Destination-year FE	no	no	yes	yes	no	no	yes	yes
Origin-year FE	no	no	no	no	yes	yes	yes	yes
Observations	18,133	18,133	18,133	18,133	18,133	18,133	18,133	18,133
Estimator	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS

Note: This table reports IV-2SLS first stage estimations associated to Table A.17. ***, ** and * denote significance at the 1%, 5% and 10% level respectively. Standard errors clustered within origin-time and destination-time pairs are reported in parentheses.

Table A.17: Alternative set of fixed effects - Main results

	$\ln \text{Mig}_{od,t}$			
	(1)	(2)	(3)	(4)
$\ln \text{Aid}_{do,t-1}$	0.4436***	0.4729***	0.4612***	0.5085***
	(0.0400)	(0.0429)	(0.0485)	(0.0535)
$\ln \text{Aid}_{(-d)o,t-1}$	-0.3063***	-0.3102***	-0.5799*	-0.5995
	(0.0393)	(0.0411)	(0.3497)	(0.3647)
$\ln \text{Multi}_{o,t-1}$	-0.0136*	-0.0148**		
	(0.0071)	(0.0071)		
$\ln \text{Dist}_{od}$	-0.9427***	-0.9330***	-0.9100***	-0.8921***
	(0.0460)	(0.0475)	(0.0459)	(0.0483)
Lang_{od}	0.4117***	0.4343***	0.3421***	0.3487***
	(0.0558)	(0.0547)	(0.0676)	(0.0695)
Col_{od}	0.5862***	0.6758***	0.5747***	0.5964***
	(0.0847)	(0.0853)	(0.0904)	(0.0971)
$\ln \text{Mig\_stock\_1970}_{od}$	0.1475***	0.1376***	0.1343***	0.1213***
	(0.0119)	(0.0119)	(0.0127)	(0.0129)
$\ln \text{GDP}_{o,t-1}$	-0.1411***	-0.1622***		
	(0.0441)	(0.0442)		
$\ln \text{GDP}_{d,t-1}$	0.8161***		0.7286***	
	(0.2362)		(0.2394)	
Destination FE	yes	no	yes	no
Origin FE	yes	yes	no	no
Year FE	yes	no	no	no
Destination-year FE	no	yes	no	yes
Origin-year FE	no	no	yes	yes
Observations	18,133	18,133	18,133	18,133
Estimator	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS
Kleibergen-Paap rk Wald F-Stat.	51.315	48.914	21.298	28.448
Stock-Yogo critical value (10% max. IV size)	7.03	7.03	7.03	7.03

Note: This table reports IV-2SLS second stage estimations. ***, ** and * denote significance at the 1%, 5% and 10% level respectively. Standard errors clustered within origin-time and destination-time pairs are reported in parentheses.

Table A.18: Alternative set of fixed effects - Transmission channels

	Non-donor-specific channel	Donor-specific channels	
		specific to donor d	*specific to all donors but d*
	β_3	$\beta_1 - \beta_3\left[\frac{\overline{\text{Aid}_{do,t-1}}}{\text{Multi}_{o,t-1}}\right]$	$\beta_2 - \beta_3\left[\frac{\overline{\text{Aid}_{(-d)o,t-1}}}{\text{Multi}_{o,t-1}}\right]$
Panel A: origin, destination, time fixed effects (small sample)			
Coefficient	-0.0136*	0.4438***	-0.3011***
Std. Err.	(0.0071)	(0.0339)	(0.0352)
Observations	18,133	18,133	18,133
Bootstrapped Err.	no	yes	yes
Panel B: origin, destination-time fixed effects			
Coefficient	-0.0148**	0.4731***	-0.3051***
Std. Err.	(0.0.0071)	(0.0358)	(0.0345)
Observations	18,133	18,133	18,133
Bootstrapped Err.	no	yes	yes

Note: This table reports coefficients associated to the transmission channels. Results for panel A are based on the IV-2SLS estimation presented in Table A.17, column (1). Results for panel B are based on the IV-2SLS estimation presented in Table A.17, column (2). ***, ** and * denote significance at the 1%, 5% and 10% level respectively.

Table A.19: Alternative level of clustering - First stage results

	ln $\text{Aid}_{do,t-1}$	ln $\text{Aid}_{(-d)o,t-1}$	ln $\text{Aid}_{do,t-1}$	ln $\text{Aid}_{(-d)o,t-1}$	ln $\text{Aid}_{do,t-1}$	ln $\text{Aid}_{(-d)o,t-1}$	ln $\text{Aid}_{do,t-1}$	ln $\text{Aid}_{(-d)o,t-1}$	ln $\text{Aid}_{do,t-1}$	ln $\text{Aid}_{(-d)o,t-1}$	ln $\text{Aid}_{do,t-1}$	ln $\text{Aid}_{(-d)o,t-1}$
	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)	(4a)	(4b)	(5a)	(5b)	(6a)	(6b)
ln $\text{IV}_{do,t-1}$	0.0865***	0.0305***	0.0865***	0.0305***	0.0865***	0.0305**	0.0865***	0.0305**	0.0865***	0.0305***	0.0865***	0.0305***
	(0.0039)	(0.0020)	(0.0109)	(0.0038)	(0.0285)	(0.0117)	(0.0287)	(0.0118)	(0.0041)	(0.0019)	(0.0078)	(0.0033)
ln $\text{IV}_{(-d)o,t-1}$	0.0035	0.1400***	0.0035	0.1400***	0.0035	0.1400***	0.0035	0.1400***	0.0035	0.1400***	0.0035	0.1400***
	(0.0054)	(0.0081)	(0.0105)	(0.0143)	(0.0128)	(0.0220)	(0.0144)	(0.0235)	(0.0054)	(0.0083)	(0.0069)	(0.0090)
Controls (Γ)	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Destination FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Origin FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Year FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	18,922	18,922	18,922	18,922	18,922	18,922	18,922	18,922	18,922	18,922	18,922	18,922
Estimator	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS
SE cluster	none	none	*o*	*o*	*d*	*d*	*o* & *d*	*o* & *d*	*ot*	*ot*	*dt*	*dt*

Note: This table reports IV-2SLS first stage estimations associated to Table A.20. ***, ** and * denote significance at the 1%, 5% and 10% level respectively. Standard errors are reported in parentheses. In column (1), robust standard errors are not clustered. In columns (2) to (6), errors are clustered along different dimensions. *o*, *ot*, *d* and *dt* denotes clustering of the errors at the origin, origin-time, destination and destination-time level respectively.

Table A.20: Alternative level of clustering - Main results

	ln $\text{Mig}_{od,t}$					
	(1)	(2)	(3)	(4)	(5)	(6)
ln $\text{Aid}_{do,t-1}$	0.3828***	0.3828***	0.3828***	0.3828***	0.3828***	0.3828***
	(0.0292)	(0.0771)	(0.0455)	(0.0446)	(0.0285)	(0.0330)
ln $\text{Aid}_{(-d)o,t-1}$	-0.1575***	-0.1575***	-0.1575***	-0.1575***	-0.1575***	-0.1575***
	(0.0265)	(0.0451)	(0.0498)	(0.0540)	(0.0267)	(0.0326)
ln $\text{Multi}_{o,t-1}$	-0.0123*	-0.0123	-0.0123	-0.0123	-0.0123*	-0.0123*
	(0.0065)	(0.0146)	(0.0099)	(0.0141)	(0.0063)	(0.0068)
Controls (Γ)	yes	yes	yes	yes	yes	yes
Destination FE	yes	yes	yes	yes	yes	yes
Origin FE	yes	yes	yes	yes	yes	yes
Year FE	yes	yes	yes	yes	yes	yes
Observations	18,922	18,922	18,922	18,922	18,922	18,922
Estimator	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS
SE cluster	none	*o*	*d*	*o* & *d*	*ot*	*dt*
Kleibergen-Paap rk Wald F-Stat.	228.922	27.728	5.522	5.280	207.820	64.502
Stock-Yogo critical value (10% max. IV size)	7.03	7.03	7.03	7.03	7.03	7.03

Note: This table reports IV-2SLS second stage estimations. ***, ** and * denote significance at the 1%, 5% and 10% level respectively. Standard errors are reported in parentheses. In column (1), robust standard errors are not clustered. In columns (2) to (6), errors are clustered along different dimensions. *o*, *ot*, *d* and *dt* denotes clustering of the errors at the origin, origin-time, destination and destination-time level respectively.

Table A.21: Alternative level of clustering - Transmission channels

	Non-donor-specific channel	Donor-specific channels	
		specific to donor d	*specific to all donors but d*
	β_3	$\beta_1 - \beta_3\left[\frac{\overline{\text{Aid}_{do,t-1}}}{\text{Multi}_{o,t-1}}\right]$	$\beta_2 - \beta_3\left[\frac{\overline{\text{Aid}_{(-d)o,t-1}}}{\text{Multi}_{o,t-1}}\right]$
Panel A: no cluster, robust			
Coefficient	-0.0123*	0.3830***	-0.1539***
Std. Err.	(0.0065)	(0.0291)	(0.0291)
Observations	18,922	18,922	18,922
Bootstrapped Err.	no	yes	yes
Panel B: cluster by origin			
Coefficient	-0.0123	0.3830***	-0.1539***
Std. Err.	(0.0146)	(0.0291)	(0.0291)
Observations	18,922	18,922	18,922
Bootstrapped Err.	no	yes	yes
Panel C: cluster by destination			
Coefficient	-0.0123	0.3830***	-0.1539***
Std. Err.	(0.0099)	(0.0291)	(0.0291)
Observations	18,922	18,922	18,922
Bootstrapped Err.	no	yes	yes
Panel D: cluster by origin & destination			
Coefficient	-0.0123	0.3830***	-0.1539***
Std. Err.	(0.0141)	(0.0291)	(0.0291)
Observations	18,922	18,922	18,922
Bootstrapped Err.	no	yes	yes
Panel E: cluster by origin-time			
Coefficient	-0.0123	0.3830***	-0.1539***
Std. Err.	(0.0063)	(0.0291)	(0.0291)
Observations	18,922	18,922	18,922
Bootstrapped Err.	no	yes	yes
Panel F: cluster by destination-time			
Coefficient	-0.0123*	0.3830***	-0.1539***
Std. Err.	(0.0068)	(0.0291)	(0.0291)
Observations	18,922	18,922	18,922
Bootstrapped Err.	no	yes	yes

Note: This table reports coefficients associated to the transmission channels. Results are based on the IV-2SLS estimations presented in Table A.20. ***, ** and * denote significance at the 1%, 5% and 10% level respectively.

Table A.22: Alternative definition of migrants and null migration rates - First stage results

	ln $\text{Aid}_{do,t-1}$	ln $\text{Aid}_{(-d)o,t-1}$
	(1a)	(1b)
ln $\text{IV}_{do,t-1}$	0.0857***	0.0306***
	(0.0079)	(0.0033)
ln $\text{IV}_{(-d)o,t-1}$	0.0035	0.1397***
	(0.0069)	(0.0092)
Controls (Γ)	yes	yes
Destination FE	yes	yes
Year FE	yes	yes
Origin FE	yes	yes
Observations	18,816	18,816
Estimator	IV-2SLS	IV-2SLS

Note: This table reports IV-2SLS first stage estimations associated to Table A.23. ***, ** and * denote significance at the 1%, 5% and 10% level respectively. Standard errors clustered within origin-time and destination-time pairs are reported in parentheses.

Table A.23: Alternative definition of migrants and null migration rates - Main results

	ln $\text{Mig}^{f}_{od,t}$	$\text{Mig}_{od,t}$	$\text{Mig}_{od,t}$
	(1)	(2)	(3)
ln $\text{Aid}_{do,t-1}$	0.3815***	0.0665***	0.2793***
	(0.0329)	(0.0088)	(0.0490)
ln $\text{Aid}_{(-d)o,t-1}$	-0.1565***	-0.0090	-0.0971**
	(0.0329)	(0.0068)	(0.0425)
ln $\text{Multi}_{o,t-1}$	-0.0126*	-0.0114***	-0.0093
	(0.0067)	(0.0039)	(0.0081)
Controls (Γ)	yes	yes	yes
Destination FE	yes	yes	yes
Origin FE	yes	yes	yes
Year FE	yes	yes	yes
Observations	18,816	19,301	19,301
Estimator	IV-2SLS	PPML	Poisson GMM
Kleibergen-Paap rk Wald F-Stat.	61.762		
Stock-Yogo critical value (10% max. IV size)	7.03		

Note: This table reports IV-2SLS second stage as well as PPML and Poisson GMM estimations. ***, ** and * denote significance at the 1%, 5% and 10% level respectively. Standard errors clustered within origin-time and destination-time pairs are reported in parentheses.

Table A.24: Alternative definition of migrants and null migration rates - Transmission channels

	Non-donor-specific channel	Donor-specific channels	
		specific to donor d	*specific to all donors but d*
	β_3	$\beta_1 - \beta_3\left[\frac{\overline{\text{Aid}_{do,t-1}}}{\text{Multi}_{o,t-1}}\right]$	$\beta_2 - \beta_3\left[\frac{\overline{\text{Aid}_{(-d)o,t-1}}}{\text{Multi}_{o,t-1}}\right]$
Panel A: Alternative definition			
Coefficient	-0.0126*	0.3817***	-0.1529***
Std. Err.	(0.0067)	(0.0295)	(0.0264)
Observations	18,816	18,816	18,816
Bootstrapped Err.	no	yes	yes
Panel B: Null migration rates - PPML			
Coefficient	-0.0114***	0.0672^{na}	-0.0011^{na}
Std. Err.	(0.0039)	na	na
Observations	19,301	19,301	19,301
Bootstrapped Err.	no	no	no
Panel C: Null migration rates - Poisson GMM			
Coefficient	-0.0093	0.2799^{na}	-0.0906^{na}
Std. Err.	(0.0081)	na	na
Observations	19,301	19,301	19,301
Bootstrapped Err.	no	no	no

Note: This table reports coefficients associated to the transmission channels. Results reported for panel A are based on the IV-2SLS estimation presented in Table A.23, column (1). Results reported for panel B and panel C are based on the PPML and Poisson GMM estimations presented in Table A.23, columns (2) and (3). ***, ** and * denote significance at the 1%, 5% and 10% level respectively. ^{na} indicates that the level of significance is not available.

Table A.25: Including null aid flows - First stage results

	ln Aid$_{do,t-1}$	ln Aid$_{(-d)o,t-1}$
	(1a)	(1b)
ln IV$_{do,t-1}$	0.2609***	0.1848***
	(0.0217)	(0.0169)
ln IV$_{(-d)o,t-1}$	-0.0167**	0.0385***
	(0.0065)	(0.0067)
Controls (Γ)	yes	yes
Destination FE	yes	yes
Origin FE	yes	yes
Year FE	yes	yes
Observations	23,764	23,764
Estimator	IV-2SLS	IV-2SLS

Note: This table reports IV-2SLS first stage estimations associated to Table A.26. ***, ** and * denote significance at the 1%, 5% and 10% level respectively. Standard errors clustered within origin-time and destination-time pairs are reported in parentheses.

Table A.26: Including null aid flows - Main results

	ln $\text{Mig}_{od,t}$	
	(1)	(2)
ln $\text{Aid}_{do,t-1}$	0.4054***	0.0764***
	(0.0586)	(0.0063)
ln $\text{Aid}_{(-d)o,t-1}$	-0.4495***	-0.0447***
	(0.0863)	(0.0064)
ln $\text{Multi}_{o,t-1}$	0.1385***	-0.0028
	(0.0413)	(0.0045)
Controls (Γ)	yes	yes
Destination FE	yes	yes
Origin FE	yes	yes
Year FE	yes	yes
Observations	23,764	23,764
Estimator	IV-2SLS	OLS
R-squared		0.8329
Kleibergen-Paap rk Wald F-Stat.	35.483	
Stock-Yogo critical value (10% max. IV size)	7.03	

Note: This table reports an IV-2SLS second stage estimation (column 1) and an OLS estimation (column 2). ***, ** and * denote significance at the 1%, 5% and 10% level respectively. Standard errors clustered within origin-time and destination-time pairs are reported in parentheses.

Table A.27: Including null aid flows - Transmission channels

	Non-donor-specific channel	Donor-specific channels	
		specific to donor d	*specific to all donors but d*
	β_3	$\beta_1 - \beta_3\left[\overline{\frac{\text{Aid}_{do,t-1}}{\text{Multi}_{o,t-1}}}\right]$	$\beta_2 - \beta_3\left[\overline{\frac{\text{Aid}_{(-d)o,t-1}}{\text{Multi}_{o,t-1}}}\right]$
Panel A: Including null aid flows - IV-2SLS			
Coefficient	0.1385***	0.4023***	-0.5568***
Std. Err.	(0.0413)	(0.0433)	(0.0828)
Observations	23,764	23,764	23,764
Bootstrapped Err.	no	yes	yes
Panel B: Including null aid flows - OLS			
Coefficient	-0.0028	0.0766***	-0.0428***
Std. Err.	(0.0045)	(0.0037)	(0.0068)
Observations	23,764	23,764	23,764
Bootstrapped Err.	no	yes	yes

Note: This table reports coefficients associated to the transmission channels. Results reported for panel A are based on the IV-2SLS baseline estimation presented in Table A.26, column (1). Results reported for panel B are based on the OLS estimation presented in Table A.26, column (2). ***, ** and * denote significance at the 1%, 5% and 10% level respectively.

Table A.28: Alternative definition of multilateral aid - First stage results

	$\ln \text{Aid}_{do,t-1}$	$\ln \text{Aid}_{(-d)o,t-1}$
	(1a)	(1b)
$\ln \text{IV}_{do,t-1}$	0.1707***	0.0342***
	(0.0167)	(0.0063)
$\ln \text{IV}_{(-d)o,t-1}$	0.2618***	0.5501***
	(0.0447)	(0.0680)
Controls (Γ)	yes	yes
Destination FE	yes	yes
Origin FE	yes	yes
Year FE	yes	yes
Observations	9,679	9,679
Estimator	IV-2SLS	IV-2SLS

Note: This table reports IV-2SLS first stage estimations associated to Table A.29. ***, ** and * denote significance at the 1%, 5% and 10% level respectively. Standard errors clustered within origin-time and destination-time pairs are reported in parentheses.

Table A.29: Alternative definition of multilateral aid - Main results

	$\ln \text{Mig}_{od,t}$
	(1)
$\ln \text{Aid}_{do,t-1}$	0.2707***
	(0.0272)
$\ln \text{Aid}_{(-d)o,t-1}$	-0.1776***
	(0.0219)
$\ln \text{Multi}_{o,t-1}$	-0.0263**
	(0.0110)
Controls (Γ)	yes
Destination FE	yes
Origin FE	yes
Year FE	yes
Observations	9,679
Estimator	IV-2SLS
Kleibergen-Paap rk Wald F-Stat.	57.568
Stock-Yogo critical value (10% max. IV size)	7.03

Note: This table reports an IV-2SLS second stage estimation. ***, ** and * denote significance at the 1%, 5% and 10% level respectively. Standard errors clustered within origin-time and destination-time pairs are reported in parentheses.

Table A.30: Alternative definition of multilateral aid - Transmission channels

	Non-donor-specific channel	Donor-specific channels	
		specific to donor d	*specific to all donors but d*
	β_3	$\beta_1 - \beta_3 \left[\frac{\overline{\text{Aid}_{do,t-1}}}{\text{Multi}_{o,t-1}}\right]$	$\beta_2 - \beta_3 \left[\frac{\overline{\text{Aid}_{(-d)o,t-1}}}{\text{Multi}_{o,t-1}}\right]$
Coefficient	-0.0263**	0.3067***	4.1027*
Std. Err.	(0.0110)	(0.0334)	(2.2541)
Observations	9,679	9,679	9,679
Bootstrapped Err.	no	yes	yes

Note: This table reports coefficients associated to the transmission channels. Results are based on the IV-2SLS baseline estimation presented in Table A.29, column (1). ***, ** and * denote significance at the 1%, 5% and 10% level respectively.