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The Aid-Migration Trade-Off

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Abstract : This paper brings out an empirically significant tradeoff between the aid flows delivered by donor countries and the inflow of migrants that they get from developing countries. It draws its implications for aid policy from a simple game-theoretic model, after reviewing the recent literature on the effects and motivations of foreign aid to developing countries. It is part of the recent effort made by economists for uncovering the hidden agenda behind foreign aid that was triggered by the dead end in which the "aid-ineffectiveness" literature has cornered itself.

1. Introduction

Are the migrants a blessing or a curse? In the rich countries, the threat of an invasion by poor migrants from the South is agitated time and again, especially before important elections. It seems that quite a sizable constituency exists for exerting pressure on the government with a view to induce it to erect some legal barriers against immigration. Some Northern European countries which used to be very liberal in this respect have recently witnessed the emergence of a National-Front type of movement, with a fairly aggressive attitude towards immigration. This phenomenon can be observed even in countries where unemployment is negligible, like Holland. However, there are voices pointing out that keeping the migrants at bay is nothing like a free good. Borjas (1995) analyzes the benefits accruing to the natives in a competitive general equilibrium framework. His model indicates that natives benefit from immigration because of the production complementarities that exist between immigrant workers and other factors of production and that these benefits are larger when immigrants are sufficiently different from the stock of native productive inputs. A different argument is used by Ortega (2000) in a dynamic labor market model with multiple equilibria. In this model, immigration tilts the bargaining strength in favor of the firms, with a positive impact on employment and wages. Other benefits have been identified outside the labor market. Gubert (2003) presents a striking calculation: in order to get as remittances the equivalent of the aid flow that France is giving to Mali, it would be enough to accept 60 000 more Malian migrants in France, assuming that they would have the same propensity to remit as those who are currently living there. This is a negligible number for a country whose population is more than 100 times larger than that. This would also help cutting public expenditures, as much less police would be needed for tracking illegal migrants and the French aid administration could also be cut sizably, were the aid flow to be cut correspondingly. Remittances are thus the key benefit that developing countries are getting

from the outflow of migrants that they send to rich countries every year. Klein and Harford (2005) document the fact that remittances are now one of the main sources of external finance for developing countries, one that is growing steadily, with a fairly smooth time profile. They have become at least as important as foreign aid for many developing countries. Based on this kind of calculations, it is clear that the opportunity cost of fighting immigration in rich countries is certainly sizable. It must be the case, then, that the anti-immigration constituencies perceive a lot of detrimental effects on their countries for convincing them to accept to pay for these costs. In fact, quantitative research has found the externalities perceived by these constituencies quite hard to confirm from a statistical point of view.

The Impacts of Immigration Flows

The effects of immigrant flows on the host countries have been widely studied in the economics literature. Most of the research on this topic looked at the impact on the labor market and in particular on the wages and employment rates of the natives. The simplest economic model of labor market equilibrium suggests that immigration is liable to create a pecuniary externality, as an increase in the labor supply due to the inflow of immigrants will lead to lower wages, or, in the presence of wage rigidities, to higher unemployment. However, in reality this negative effect may be mitigated by adjustments of the labor market, for example firms moving to the regions where labor is becoming cheaper, thus increasing the labor demand there, or natives moving away from the regions where the migrants arrived. Moreover, migrants choose their destination taking into account expected future wages and possible demand shocks unobserved by the econometrician (Borjas 2003). For these reasons, measuring the effect of migrants on wages is a difficult empirical exercise and there is no general consensus on this question. Borjas (2003) finds that immigration has a considerable negative impact on the wages of the native workers based on data from 1960-1990 US decennial censuses and the 1998-2001 current population surveys. Card (2001) finds that

immigration flows in the late 80s in large immigrant US cities reduced the relative employment rates of low skilled natives by up to 1 % and their relative wages by no more than 3 %. Friedberg and Hunt (1995) review the existing theoretical and empirical literature on the impact of immigrants on host countries' wages and growth and conclude that the impact on natives' wages is very small. Longhi *et. al*. (2005) provide a meta-analysis of 18 empirical studies of this type. They conclude that there is a robust negative and statistically significant, but small impact of immigrants on natives' wages and that this impact is larger in Europe than in he US.

Other types of externalities have also been discussed in the context of immigration. Beside its effects on the economy, immigration has also demographic and political effects on the host countries. As immigrant populations are generally younger and have higher fertility rates than the natives, immigration may be a way to decrease the ratio of age-dependent population in the industrialized countries. From a political point of view, some countries may worry about immigrants being a threat to their national identity, ethnic and cultural stability. The creation by the French President Nicolas Sarkozy of a *Ministry of Immigration, Integration and National Identity* is a response to this type of fears. There are also fears of infiltration by potential terrorists or drug traffickers (Neumayer, 2006). These more political concerns seem to play a role at least as important as the economic impacts described above in determining the decisions by the immigration authorities. Neumayer (2006) shows that the poorer, the less democratic, and the more exposed to armed political conflict a county is, the more its citizens are likely to be imposed visa restrictions. The same is true for nationals of countries which were the origin of terrorist attacks. It thus seems that migrants from the poorest countries are less welcome than migrants from rich countries. As these countries are also the most important recipients of foreign aid, it is quite natural to ask whether foreign aid is used to reduce immigration from these countries. Other arguments have been raised against

immigration based on its impact on the source countries. As far as the origin country is concerned, one of the most important consequences of out-migration is the flow of remittances received by migrants' families and friends. Remittances are undoubtedly an essential means for reducing poverty and insuring the populations against risks. In many developing countries, remittances are a higher and more stable source of finance than official development assistance. But remittances do not have only positive consequences on the receiving country. Kapur (2004) notes that in some cases remittances were an important source of funding for terrorism and civil wars. He gives the example of Somalia where a large proportion of the remittances supported arms purchases for the rural guerilla, that of Armenia, where Diaspora remittances boosted tough nationalist regimes and complicated efforts to solve regional conflicts and the example of the Democratic people's Republic of Korea, where the regime was strengthened by getting access to scarce foreign currency resources. The author also mentions the creation of a culture of dependency and lower participation in the labor market of the population that did not migrate, as well as the risks of a Dutch disease phenomenon if remittances are spent largely on non-tradable goods like housing or land.

Some empirical findings shed some light on the relative impact of economic and other variables on public opinions of receiving countries and their influence on immigration policies. Scheve and Slaughter (2001) use a direct measure of US population's preferences over immigration obtained from the 1992 National Election Studies and show that less-skilled workers are significantly more likely to prefer limiting immigrant inflows into the United States. Mayda (2006) uses individual-level survey data sets as well as aggregate data on international migrations to study attitudes toward immigrants and their impact on migration policies. She finds that skilled individuals are more likely to be pro-immigration in countries where the relative skill composition of natives to immigrants is high. Other factors that influence migration attitudes are concerns about the impact of immigration on crime rates,

individual perceptions of the cultural effect of foreigners, racist feelings and the size of inflows of asylum seekers. She finds that higher-per-capita-GDP countries are on average less open to immigration, after allowing for the influence of individual-level variables. O'Rourke and Sinnott (2006) use a cross-country dataset to investigate the determinants of individual attitudes towards immigration. Their study indicates that attitudes towards immigration reflect economic interests as well as nationalist sentiment. They show that for labor market participants, the high-skilled are less opposed to immigration than the low-skilled, and this effect is larger in richer countries than in poorer countries, and in more equal countries than in more unequal ones. For the people who are not in the labor force, noneconomic factors are much more important in determining the attitudes toward migration.

Facchini and Mayda (2008) use a sample of 34 countries included in the 1995 and 2003 rounds of the International Social Survey Programme to show that it is voters' negative opinions towards migration that explain the restrictive migration policies in place in the majority of destination countries. They show that countries where the median voter is more opposed to migration tend to implement more restrictive policies. Thus, it seems that besides the impact of immigrants on the economy, rich countries citizens worry about immigrants being a threat to their security, national identity, ethnic and cultural stability.

The Determinants of Immigration Flows

Hence, many arguments have been accumulated for explaining, without necessarily justifying, why governments of the North want to curb immigration into their countries. The key issue is then whether there is anything that they really do about it. Are there policy handles that they use for reducing this inflow? Moreover, not all migrants are regarded as undesirable by rich countries' governments. Many countries let in "desired" migrants, *i.e.* people with similar values, high education level, or qualified for the production sectors lacking labor force, etc. In reality, a country's authorities can only control a part of the

immigration flows through visa quotas. Many industrialized countries have family reunification laws, which allow chain immigration and many countries have signed asylum and refugee protection treaties that oblige them to accept some of these populations. Moreover, visa quotas do not reduce the number of illegal entrants, as discussed forcefully by de Haas (2006). Hatton and Williams (2002) provide some figures that illustrate this phenomenon: about 300,000 illegal immigrants enter the US every year and 400,000 to 500,000 enter Western Europe. Illegal aliens are estimated to add ten or fifteen percent to the stock of foreign-born in OECD countries. According to UNHCR statistics 560,000 asylum applications were received by 28 industrialized countries in 2000 and about one million were waiting for a decision. So the visas instrument alone is not a sufficient solution if the desired immigration level is lower than the observed one, or the one expected to prevail in the future if no other measure is adopted.

There exists a rich empirical literature aimed at uncovering the determinants of the immigration flows, which has produced a good crop of convergent findings. A recent paper investigating these factors is Mayda (2007). She uses a panel of bilateral migration flows to 14 OECD countries by country of origin between 1980 and 1995. She finds that income improvements in the destination countries as well as the share of young population in the origin country have positive and significant impacts on emigration rates, while distance between the countries and migration quotas have negative effects. Similar results were found by Jennissen (2003), who studies the economic determinants of net immigration in Western Europe in the period 1960-1998 using net migration flows as a dependent variable. He finds that destination GDP per capita, existing migrant stock and education level of the population have positive effects while unemployment rates have a negative effect on net migration flows. Hatton and Williamson (2002) present a quantitative assessment of the economic and demographic fundamentals that drive world migration across different historical periods and

around the world. They use data on average net immigration rates over five-year periods from 1970-1975 to 1995-2000 for 80 countries. They find that the share of population aged 15-29 in the receiving country has a negative effect on its immigration rates while the immigrant stock has a positive effect on net immigration. Moreover, they find that a rise in domestic income relative to the world and relative to the region both increase a country's net immigration. Lucas (2005) studies both the causes and the consequences of migration from the lower income countries. Neumayer (2005) studies the causes of asylum migration using a panel on the annual number of asylum seekers into Western European countries by country of origin between 1982 and 1999. He finds that human rights abuse, political violence and state failure are important determinants of asylum migration. Democracy has a significant, but non linear effect. He also finds that economic conditions in the origin countries are an important determinant of the number of asylum seekers coming to Western Europe. He then suggests that generous development assistance and the opening of protected European markets to imports from these countries could lower migration pressure, a view that de Haas (2006) criticizes forcefully.

Surprisingly, very few quantitative studies exist on the link between aid and migrations. From the above literature, income differentials appear to be one of the main determinants of the supply of immigrants. As foreign aid is a transfer that reduces, at least at the margin, these differentials, it is quite natural to ask the question whether foreign aid reduces immigration. Castles (2003) discusses how the policies towards migration pursued by Britain and the European Union are generally unsuccessful and claims that reducing North-South inequality is a key to effective migration management. Morisson (1982) argues that the most promising ways for development assistance to influence migration in the short to medium run is through employment-generating activities and in the long run by reducing population growth and improving income distribution. In fact, for countries with very low

incomes, foreign aid could actually increase emigration rates in the short run because of a possible migration hump phenomenon. Rotte and Vogler (2000) use a panel of data on international migrations to Germany from 86 origin countries between 1981 and 1995 and study the influences of economic, demographic and political factors on inflows to Germany. They find no significant effect of aid. Berthélemy *et al.* (2008) estimate the two-way impact of aid and migrations using cross country data. They find a positive impact of the former on the latter in a simultaneous-equation system.

Outline

The present paper is also an attempt at uncovering the main determinants of the inflow of migrants into rich countries, with a view to identify whether there are some policy tools that governments of the North can (and do) use for curbing immigration, beside visa control. This paper is best seen as part of a research program that tries to discover the true agenda behind foreign aid, which the so-called "aid-ineffectiveness" literature has shown to be different from the proclaimed goal of boosting growth and fighting poverty in the recipient country. This point is developed in the next section. Then, a very simple game-theoretic model is sketched in order to derive some testable predictions in section 3. The empirical analysis is presented in section 4, where we show that aid does indeed belong to the toolbox used by rich-countries' governments for controlling immigration. The conclusions are gathered in section 5.

2. The Search for Foreign Aid's Hidden Agenda

The academic literature on foreign aid has been at times quite paradoxical. It caught the public attention under the generic name of the "aid-ineffectiveness" literature. Easterly (2006) has published a very influential review of that literature, aimed at a broad audience. This literature shows quite consistently that foreign aid is not very successful at boosting

growth and reducing poverty in recipient countries. The contributors to this literature end up expressing a severe criticism of the international community, which seems unable to pursue its proclaimed objective. The much advertised motto posted by the World Bank: *Our Dream: A World Free of Poverty*, seems bound to remain just a dream. This seems to challenge the standard methodology of economics at a fundamental level: how is it that the international community has spent consistently zillions of dollars in foreign aid for nearly six decades without being "effective". Aren't there any error-correction mechanisms that can put an end to this "massive waste"? However, this apparent paradox only concerns a small share of the academic literature on aid, and is just the result of some hasty interpretation of the findings.

The Aid-Ineffectiveness Puzzle

The root cause of this turmoil is that some economists have taken at face value the declared objectives of foreign aid. The latter has always claimed that it was aimed at boosting economic growth in the recipient country. For a long time it was focused on filling in the "saving gap", i.e., the alleged insufficient national saving flow that was supposed to afflict poor countries. Collier (2007) suggests that the change of emphasis that occurred in the 1980s and 1990s, from economic growth to poverty alleviation, was the result of a public-relation campaign aimed at harnessing electoral support in favor of foreign aid from all sides of the political spectrum in rich countries. However, academic economists started to blow the whistle pretty soon, showing that there was not much empirical support for the view that foreign aid was boosting growth in poor countries or reducing significantly the incidence of poverty. A much cited paper by Boone (1996) triggered a wave of debates on "aid-ineffectiveness", by showing that no significant impact of aid on growth could be found in cross-country regressions. The highly influential paper by Burnside and Dollar (2000) brought out forcefully that the effect of aid must be analyzed while taking due account of some heterogeneity among recipient countries. They favor an index of the quality of

macroeconomic policies as their heterogeneity parameter, as their findings suggest that aid boosts growth when it is given to countries having a sound macro-policy framework. Similarly, Svensson (1999) presents some cross-country regression findings showing that aid is more effective at affecting growth in more democratic countries. In the same vein, Kosack and Tobin (2006) find that foreign aid and democracy have a positive impact on economic growth and human development, provided there is a minimum level of human capital in the recipient country. Nevertheless, the dominant diagnosis is that aid is not boosting growth in general, with some noteworthy exceptions. Some authors blamed the failure of aid on the misconceived approach to its delivery based on "conditionality" (e.g., Collier, 1997). Some theorists came along with some clever schemes to fix it (Azam and Laffont, 2003, Svensson, 2000 and 2003). Another influential response has been to claim that the reason for the failure of aid to be "effective" was that there was not enough of it. What was needed was a "big push" for lifting people out of the "poverty trap". This view was forcefully supported by Sachs (2005), while Collier (2007) supported a more subtle variant of it.

However, these findings and the response that they triggered raise a more fundamental methodological issue: do they mean that aid is ineffective, or that its true agenda differs from the much publicized goal of boosting growth and alleviating poverty? The proper methodology of economics is based on "revealed preference" theory: instead of trying to assess the effectiveness of foreign aid by looking at the extent to which it achieves its stated objective, we should try to infer its true agenda from its actual achievements. When people spend consistently zillions of dollars during six decades or so, they must certainly have achieved a measure of success that justifies the continuation of this expenditure flow. Some economists have tried to discover foreign aid's hidden agenda by looking at the determinants of its allocation across countries. Their results suggest that foreign aid's impact on growth and development is probably not the crucial determinant of its allocation across countries. For

example, Burnside and Dollar (2000) find that the quality of the macroeconomic policies pursued in a given country does not make the latter more likely to receive more aid, although it makes aid more "effective", as mentioned above. Similarly, Svensson (1999) presents some cross-country regression analysis showing that, while aid is more effective at affecting growth in more democratic countries, it is not allocated to the latter more favorably. This finding suggests that aid allocation is governed by other considerations, hinting again that there is a hidden agenda beside the generous drive to alleviate poverty.

The Donors' Revealed Preferences

This political dimension of aid allocation is further analyzed by Alesina and Dollar (2000), who bring out that colonial past and strategic alliances are the main determinants of the amount of aid received by poor countries. However, they also show that, in the time series dimension, democratization is often followed by increased aid, although there is no significant static effect of democracy. By contrast, Berthélemy and Tichit (2004) find a significant positive impact of the Freedom House index of civil liberty and political right, in a panel data analysis covering the period 1980-1999, for 137 aid recipient countries, and 22 bilateral donors. This finding is confirmed in a later study, using a different estimation method (Berthélemy, 2006). Nevertheless, the latter two studies bring out quite strongly that most bilateral donors seem to be guided by their self-interest for allocating their aid, and in particular by their commercial relationships. Fleck and Kilby (2006a) show that the latter concern plays also an important part in determining the allocation of U.S. bilateral aid across countries, but one that changes with the political orientation of the president. More conservative ones are more influenced by commercial interests than more liberal ones. The results reported by Fleck and Kilby (2006b) suggest that the validity of such a diagnosis can be extended to the case of the World Bank, whose aid-allocation behavior is significantly influenced by U.S. trading and political interests. However, one may wonder whether trading

flows are perfectly exogenous, at least as far as bilateral donors are concerned. Although most of the latter have formally ruled out tied aid, towards the end of that sample period, some implicit and subtle ways of tying aid remain probably in operation. Moreover, aid helps financing the trade deficit of developing countries, and this is certainly boosting the imports from industrialized countries, which are also the main donors. This is even more likely towards the end of that period of analysis, as "trade liberalization" was a prominent feature of the reforms programs supported by foreign aid, under the influence of the Bretton Woods institutions. Hence, some reverse causation between aid and trade might be present, channeled by various mechanisms, so that these findings might be misleading.

Another step is taken by Chauvet (2002) in the political analysis of aid allocation. She looks at the relationship between aid allocation across countries and various kinds of "socio-political instabilities". The latter refers to various events that reflect political troubles in the recipient countries. She distinguishes: (i) elite instability, including coup d'etat, revolutions, and major government crises; (ii) violent instability, including political assassinations, guerrilla warfare, and civil wars; and (iii) social instability, including strikes, demonstrations and riots. She shows that these three types of events have different impacts on the allocation of aid, depending also on the kind of aid. Instabilities of types (i) and (ii) have a positive impact, suggesting that the aid flow is directed at governments that are under political threat, while type (iii) has a negative one, showing that aid shies away from the threats directed more specifically at the economy. These results thus suggest that the donors are giving aid to recipient governments in response to some political motivation, with a kind of conservative bent aimed at providing support to incumbent governments. Economic issues like growth and poverty alleviation only seem to play a secondary role, insofar as governments facing more "social instabilities", i.e., the likely response of some constituencies to economic hardship, are somehow punished by getting less aid money. However, this whole line of empirical research

tries to infer from the determinants of the aid allocation across countries what donors are really trying to achieve, but it fails to test directly for the impact of aid on the presumed objectives.

Alesina and Weder (2002) use a slightly different empirical strategy, by looking directly at the effect of aid on some potential objectives of the donors. They show that, while the level of corruption plaguing the recipient government does not affect significantly the allocation of aid across countries, there is a significant effect in the other direction. Their results suggest that an increase in aid this year increases the level of corruption next year. They call this the "voracity effect". They thus conclude that donors do not care at all about corruption in the recipient country. Similarly, Azam and Delacroix (2006) and Azam and Thelen (2008) look directly at the effect of aid on some potential objectives of the donors while taking due account of reverse causation. Using such a structural econometric approach, they show that aid is effective at fighting terrorism and that the donors allocate aid across countries with a view to pursue this objective. The present paper is a further attempt at identifying a donor objective, by testing whether aid is actually used for reducing migrations from poor countries.

3. The Implications of the Aid-Migration Trade-Off

A very simple model is sufficient for capturing the main issues raised by the potential tradeoff between aid and migration, when the rich countries want to use aid policy for reducing the migration inflow into their country. It is most likely that there are some spillovers, insofar as the aid given by one donor might reduce simultaneously, if at all, the migrations outflow from the recipient country in the direction of both the donor country and other destinations. This entails that some free-riding is bound to occur, unless the different donors coordinate their action. The following model illustrates this point.

The Model

Assume that there are three countries in the world: there are two donor countries, labeled 1 and 2, whose level of affluence is potentially attracting migrants, and a developing country, which sends a flow of migrants to each donor country, n_1 and n_2, respectively. The donors have the possibility of giving aid to the poor country, with a view to reduce the flow of migrants that they receive from it. Two main mechanisms can explain why aid can have such a negative impact on the migration flow. There is first an improved economic situation in the recipient country that the aid flow can help to create, by supporting productive investment and creating jobs. Next, the aid flow can provide an inducement to the recipient government to try to deter out-migration, if the aid is somehow given conditionally upon the adoption of some policy measures aimed at reducing the latter. For example, some financial incentives can be created in favor of returning migrants, thus reducing the net outflow, *ceteris paribus*, or for targeting some migration-prone groups with specific actions. For instance, it is known that the Soninke ethnic group is the most migration-prone one in Mali and Senegal, because of the well-established Diaspora that they can rely on (see Azam and Gubert, 2006). Then, a "co-development" project has been implemented with French aid money, with a view to reduce their migrations outflow by developing some attractive programs in their region of origin.

Let a_1 and a_2 denote these aid flows, given by countries 1 and 2, respectively. Assume then that the inflow of migrants in donor-country 1 is governed by the following function:

$$n_1 = f(a_1, a_2, \theta). \tag{1}$$

We assume that the impacts of the two aid flows on n_1 are negative, reflecting the aid-migration trade-off that we want to analyze. The negative impact of the own aid flow is quite obvious, as discussed above, while the cross effect deserves an additional comment. If either aid flow has a positive impact on the level of economic activity and the creation of jobs that

might reduce the attractiveness of migration for nationals from the developing country, then it cannot be assumed that this will affect only the outflow directed at each donor country separately. There is necessarily some spill-over on the outflow going to the other country. In the limit, it could be argued that it is only the total aid flow $a_1 + a_2$ that matters for affecting the outflows of migrants, if the two aid flows had the same impact on the recipient economy. However, the more general specification embedded in (1) allows for some finer targeting by donor countries, which might devise some policies that mainly affect the migration flow heading in its own direction. For example, this could be done by targeting a specific ethnic group which is connected to an important Diaspora in one of the donor countries. The parameter θ captures the set of other variables that are liable in either country to affect the outflow of migrants. By permuting the subscripts 1 and 2, we can readily generate the equivalent function to (1) for donor country 2.

Then, assume that country 1 is prepared to incur the cost of providing aid if the latter has some effectiveness for reducing the migration flow in its direction. This is captured by assuming that country 1 seeks to minimize the following loss function:

$$\min_{a_1, n_1} L\left(a_1, n_1, \lambda\right), \tag{2}$$

which is increasing and convex in its first two arguments. This captures both the fact that aid has a cost for the donating country, by using up some fiscal revenues, and that for whatever reasons that country's government tends to feel that its country is attracting too many migrants. The shift parameter λ captures the contextual variables that are liable to affect the government's feelings about immigration, like elections or other political determinants. A similar function is assumed to govern the choices made by country 2.

The Nash Equilibrium Aid and Migration Flows

If the two countries determine their aid policy without any coordination between them, then the aid flows and the migration flows will be determined by the Nash equilibrium of the

game. This is the standard equilibrium concept in non-cooperative game theory, which

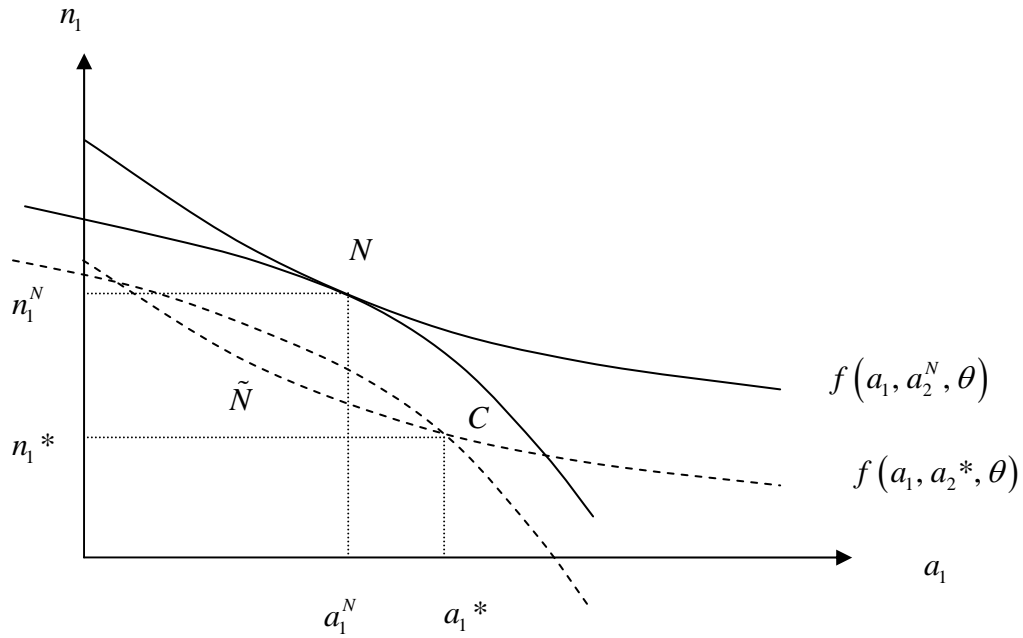assumes that each player takes the other one's equilibrium choice as given.

Figure 1: The Nash-Equilibrium and the Optimum Aid Flows

Figure 1 describes how country 1 determines its best-response function $a_1(a_2, \theta, \lambda)$

by minimizing (2) subject to the trade-off imbedded in (1), while taking a_2, θ and λ as

given. The convex curve represents the aid-migration trade-off (1), assuming that the aid flow

chosen by donor 2 is at its Nash equilibrium value a_2^N. The assumed convexity of the curve

captures the idea that aid has a decreasing marginal impact on the inflow of migrants, so that

even a very high aid flow would not reduce their number to zero. Then, donor 1 will choose

its best-response aid flow a_1^N at the point where an indifference curve for the loss function

(2), represented by the concave curve, is tangent to the aid-migration trade-off. The resulting

point, labeled N in figure 1 is the Nash-equilibrium joint choice of the aid flow a_1^N and the

migration inflow n_1^N made by country 1, given the equilibrium aid flow a_2^N chosen by country 2. A similar diagram could obviously be drawn for country 2.

The Case for Coordinating Aid

Now, it is easily shown that such a Nash equilibrium point is inefficient, from the point of view of the donor countries. It involves too little aid being donated by the two donor countries, because of a free-rider problem. The spill-over effects of aid on migration analyzed above are liable to dilute the incentives faced by each donor to spend aid for reducing immigration. In the Nash equilibrium, each player takes the equilibrium choice of the other one as given. However, the two players could improve on this outcome by coordinating their aid decisions, in order to take the spill-over effects into account. The intuition for this result can be grasped by looking at the dashed lines in figure 1. Point C represents such a coordinated equilibrium outcome, as can be demonstrated by the following argument. Notice that if donor 2 increases its aid flow relative to a_2^N, then the aid-migration trade-off facing donor country 1 shifts downwards, to a position illustrated by the dashed convex curve corresponding to $a_2^* > a_2^N$. This downward shift reflects the spill-over effect of country 2's aid flow reducing the inflow of migrants into country 1, for whichever given level of aid donated by country 1. Then, in the coordinated equilibrium, donor 1 will reciprocate the increased aid flow given by donor 2 at a point like C, where $a_1^* > a_1^N$. As point C is located on a lower indifference curve than point N, corresponding thus to a lower value of the loss function (2), then donor 1 is better-off in this coordinated equilibrium point than in the Nash equilibrium. This occurs despite the fact that it spends more money on aid, because it gets a lower inflow of migrants in return. A similar diagram could obviously be drawn for donor country 2.

Figure 1 also helps us to grasp that such a coordinated equilibrium requires a highly credible ability to commit irreversibly from the players in order to overcome the temptation to

renege *ex post*. Once player 2 has engaged a_2*, so that the aid-migration trade-off has shifted downwards to the dashed position, then player 1 is tempted to reduce its own contribution by moving leftward along the trade-off in order to reach an even lower indifference curve of its loss function, e.g., to reach point $\tilde{N}$. Anticipating this, player 2 might then be deterred from increasing its own aid flow in the first place. This is the essence of the free-rider problem, which was made popular by the well-known "prisoner's dilemma". Hence, both donor countries need to have a credible way of "tying their own hands" for such a coordinated outcome to come about. As a matter of fact, we can observe in the real world that the donor community is making a lot of effort to make its pledged contributions credible, using various methods ranging from the international definition of the Millennium Development Goals to the creation of powerful aid-dependent constituencies in their own countries (e.g., by tying aid in favor of some powerful firms, or by creating an overstaffed aid administration). Nevertheless, unless we are prepared to assume that donor countries are coordinating perfectly their aid policy regarding the reduction of migrations inflows, this free-riding problem suggests that the aid flows that we observe in the real world are probably below their optimal values.

The foregoing short theoretical analysis of the implications of the aid-migration trade-off rests heavily on the assumptions that (i) such a trade-off does exist in the real world, and (ii) there are some spillovers such that the aid given by one country is liable to affect the inflow of migrants entering another country. The empirical exercises offered in the next section aim at testing whether these two assumptions are supported by the data.

4. Empirical Results

As shown by figure 2, a quick look at the data does not seem very promising for the aid-migration trade-off hypothesis. It shows that there seems to be a positive correlation

between the number of immigrants coming in a donor country and the amount of foreign aid that the latter disburses. The following section shows that this first impression is seriously misleading.
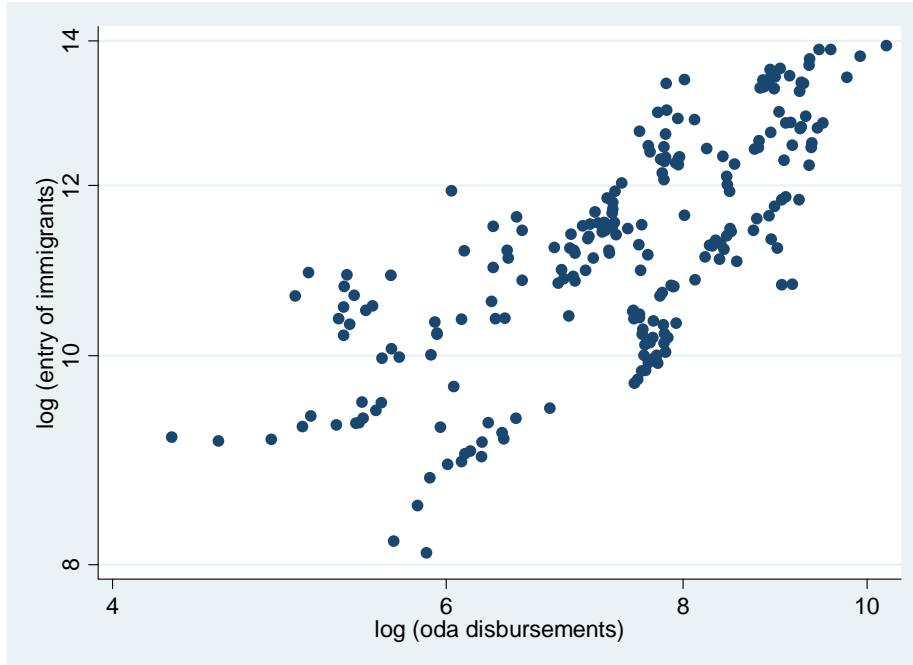

Figure 2: ODA Disbursements and Entry of immigrants

The Search for a Structural Equation

The positive correlation shown at figure 2 does not represent any meaningful behavioral relationship between these two variables, because it fails to control for many relevant variables. Nevertheless, Berthélemy *et al.* (2008) find a similar positive relationship between migration and aid in an equation that controls for many variables. They cautiously explain it by referring to some "policy coherence", arguing that donor countries are actively combining their aid and migration policies. Our results below suggest instead that these authors are facing a specification problem. Our little model presented above suggests that aid disbursements and migration inflows are jointly determined in equilibrium, like their interpretation suggests, but with different predictions.

By changing the other determinants of the migration inflow that we have captured by the parameter θ, we can generate some comparative-static predictions that are compatible

with figure 2. Imagine that such an exogenous change shifts the aid-migration trade-off upwards. Then, it is most likely that the equilibrium points N or C will shift to the northeast, i.e., upwards and to the right. This entails that both the aid disbursed and the migration inflow will increase simultaneously. The reason for such shifts is that if more migrants are forthcoming for a given aid flow, the donor country will respond both by increasing its aid flow somewhat and by letting a bit more migrants come in, as the marginal impact of aid on migration is decreasing. The latter effect entails that the marginal cost of reducing immigration by increasing foreign aid increases for the donor in this case. This mental experiment suggests two things that a correct empirical analysis should take into account: (i) it is crucial to include the right control variables in the migration equation in order to identify correctly the aid-migration trade-off, and (ii) the aid flow itself is probably endogenous, and this should also be controlled for. Because it is well known that most econometric methods for controlling for endogeneity entail a potential loss of efficiency, we first present the results without taking this problem into account. We then test whether this entails a significant endogeneity bias in a second stage. This two-step approach allows us to perform two tests of interest with one equation, namely (i) aid has a significant negative impact on the inflow of migrants, and (ii) donors are actively using foreign aid as a policy-response aimed at reducing the migrations inflows that they are facing.

Because of obvious availability problems, we are working with data on the number of legal migrants, while we are really interested in the total number of migrants. This is what our aid-migration trade-off is liable to govern. However, because we are applying panel-data techniques, using country fixed effects, we can hope to learn a lot about the latter from our econometric analysis. The following argument explains why. Assume that the number of legal migrants is a random fraction of their total number, which reflects among other things the immigration-restriction policy enforced by the destination country. Then, because we are

working with the logarithm of the number of legal migrants, the mean value of that random fraction feeds in the country fixed-effect, while the deviations relative to that mean are feeding in the residuals.

Formally, if n_L is the number of legal migrants and n the total number of migrants, we can assume that:

$$n_L = \phi(G, \varepsilon) n, \tag{3}$$

where G is a set of variables capturing the immigration-restriction policy stance of the government, and $0 \leq \phi(G, \varepsilon) \leq 1$ is the random share of legal migrants, depending on the exogenous shock variable ε. Then, by taking the logarithm of (3), we get:

$$Log\, n_L = Log\, \phi(G, \varepsilon) + Log\, n. \tag{4}$$

Therefore, unless the restriction policy pursued by each government has changed drastically over our relatively short sample period, which spans 1995-2003, it should be well controlled for by the country-fixed effects. This assumes that there is more variation across countries in this respect than within each country across time. Then, our equations explaining the logarithm of the number of legal migrants should in fact teach us a lot of lessons about the total number of migrants entering each country.

Table 1 presents the results of four regression equations that explain the inflow of legal migrants from low income countries and lower middle income ones into donor countries. This is meant to capture the idea that probably donor countries are not viewing the inflows of migrants from other rich countries in the same way as they do for those from poorer countries. We also performed all the estimations with the total inflows, with mostly similar but sometimes significantly different results. In particular, the income tax rate is significant for migrants from rich countries, while it does not matter for migrants from poorer countries.

Table 1: Regression Results

	(1)	(2)	(3)	(4)
Unemployment Rate	-0.30***	-0.18**	-0.30***	-0.14**
	(0.09)	(0.08)	(0.09)	(0.08)
Social Expenditures (%)	0.32***	0.30***	0.32***	0.34***
	(0.09)	(0.09)	(0.09)	(0.10)
Log Per Capita GDP	0.54	9.53***	0.54	14.80***
	(1.42)	(2.82)	(1.42)	(4.97)
Log Stock Foreign Population	0.19	0.57	0.17	0.91*
	(0.57)	(0.50)	(0.59)	(0.47)
Log ODA Disbursements	**0.46**	**-3.68*****	**0.43**	**-5.15*****
	(0.32)	**(1.15)**	**(0.28)**	**(1.66)**
Log Multilateral Disbursements	-	**-**	**0.10**	**-1.43**
			(0.27)	**(0.90)**
Endogeneity Bias ODA	-	**4.47*****	-	**5.90*****
		(1.26)		**(1.73)**
Endogeneity Bias Multilateral	-	**-**	-	**1.50**
				(0.96)
Nb. Obs.	118	117	118	116
F -test	9.50	9.84	7.87	7.64

Note: The dependent variable is the log of the inflow of migrants from low income and lower middle income countries. All explanatory variables are lagged once. Country fixed effects have been used, and are not reported for the sake of saving space. The sample is comprised of the 22 donor countries of the DAC for 1995-2003, with the exceptions of New Zealand, for which the stock of foreign population is missing, and Australia and Canada for which this information is only available for one point in time. The numbers in parentheses below the estimated coefficients are the robust standard errors. The instruments used are the log of public expenditures on order and security and the percentage of right-wing in parliament in the destination country. Their reduced-form impact on the aid variables are presented in the appendix.

In columns (1) and (3), no attempt is made at controlling for endogeneity, while this is done in columns (2) and (4). The method used for performing this control is based on the standard Hausman test, and is further discussed below. All the explanatory variables are

lagged once. This is potentially helping to mitigate any remaining endogeneity problems, in particular those that might affect the various control variables, and it provides as well some information about the potential time-lag that might be present in the response of migrations flows to changes in incentives.

Four control variables are included, of which three came out consistently as being highly significant. The unemployment rate is highly significant, reflecting the deterrent effect of a depressed labor market in the host country. When the probability of finding a job is low in the destination country, then migrants seem to postpone their travel or even to cancel it. By contrast, the social expenditures policy pursued by the target country is a significant attraction factor, and it is significant in all the columns. Industrialized countries that spend more on social items like health and education are quite obviously more attractive to migrants than countries which have a more conservative policy stance. Then, we find a strange result for per capita GDP in columns (1) and (3), where it seems to have a negligible impact on the inflow of migrants. This is quite a counter-intuitive result, which suggests the presence of an estimation problem. Fortunately, this effect is not robust to the correction of the endogeneity bias affecting the impact of aid, as this coefficient becomes positive and significant in columns (2) and (4). It thus seems that the impact of the business cycle and national income on immigration is fully captured by the unemployment rate and GDP per capita. Lastly, we find that the existing stock of foreign population already residing in the country of destination is only significant at the 10 % level in equation (4). This variable is meant to reflect the well-known network effects that play a key role in the migration process in many studies. For example, Azam and Gubert (2006) show that such an effect can explain the ethnic bias in migration. They show that two ethnic groups living in the same region of the Senegal River valley, in Western Mali, and thus facing the same economic conditions, have a very different migration pattern. They use historical evidence to show that the group with a long history of

out-migration is sending a much higher fraction of its population abroad than the group without such a migration history. The established Diaspora from that group thus serves as a bridgehead that reduces the costs of migrating for the prospective new migrants from the same group, by helping them to find a job and an accommodation, and then providing the usual informal credit and insurance services that migrants' networks are known for delivering to their members. Our findings reported above suggest that such an effect is not very strong at the country level, once the impact of foreign aid is taken into account. The stock of foreign population in the destination country is probably too coarse a measure for capture this effect.

Testing for the Impact of Aid

Then, the test variables are capturing the aid disbursed by the donor countries. In order to get some insight into the relative effectiveness of various aid flows, we have used first the log of ODA disbursements by the destination country, and then tested whether multilateral aid disbursements had a differential impact by introducing this variable beside ODA. Arguably, the multilateral aid captures a much better "coordinated" aid policy than ODA, which includes quite a lot of bilateral aid. This interpretation reflects the idea that the main donors have a say in the way the World Bank and other multilateral donor agencies determine multilateral aid disbursements, but that they also have a clear opportunity to coordinate their decisions regarding these disbursements at the board meetings or in the corridors. The model presented above suggests that coordinated aid flows could have some multiplier effects, as they imply a quid-pro-quo by other donors. It turns out that the ODA disbursements are the most significant aid variable coming out of our regressions (2) and (4), with the predicted negative sign. This is consistent with our theoretical framework, which suggests that foreign aid is probably an effective tool for reducing the inflow of migrants into rich countries. However, the model also raises the question whether coordinated aid is more powerful as a tool against immigration than un-coordinated aid. Hence, general ODA, which includes both

bilateral aid and the contributions channeled through the Bretton Woods and other multilateral institutions, could be less effective than the latter taken separately. Our findings do not support this differential impact hypothesis. This suggests that in fact donor countries somehow manage to coordinate equally well their bilateral and multilateral aid flows.

The technique applied in column (2) and (4) for controlling for endogeneity is derived from the standard Hausman test. Two auxiliary reduced-form equations have been estimated for *Log* ODA and *Log* multilateral aid, which are assumed endogenous in the theoretical framework presented above, using the *Log* of public expenditures on order and security, the percentage of the right wing in parliament, and the *Log* of government revenues (in equation (4) only) as instruments, beside the four exogenous variables already included in table 1. These variables are regarded as the "contextual" variables captured by λ in the model above. The first-stage reduced-form equations are presented in the appendix. The residuals from these equations have then been included beside the aid variables themselves, at columns (2) and (4), and their estimated coefficients provide estimates of the endogeneity biases for each variable. Moreover, including these residuals in the equations provides an additional benefit, as it corrects the estimated coefficients of the aid variables themselves for the endogeneity bias that affects them in the un-controlled equation. This justifies the discussion presented above of the estimated coefficients of these aid variables. For the tests performed at columns (2) and (4), the residuals are obviously lagged. The corresponding estimates of the endogeneity biases are presented in table 1 under this heading. Moreover, this procedure yields the correct estimates for the coefficients of the variables themselves, as mentioned above. In column (2), where ODA only is included, we find that the latter is strongly significant and the exogeneity assumption is rejected at the 1 % level. The correct interpretation of this test as an endogeneity test is not immediate. The specification of the immigration function at columns (1) through (4) assumes that the inflow of migrants responds

to incentives with a one-year lag. Then, the endogeneity test performed at columns (2) and (4) assumes that the government in the donor country is adjusting its aid flow in year t-1 on the basis of its forecast of a component of the random shock affecting the immigration flow in year t, assuming that this forecast is based on some information that is not available to the econometrician. This may be the case for example if the government is using a lead indicator based on the number of visa applications in year t-1 that will only entail the actual migration in the subsequent year, a piece of information that we have not been able to include in our estimated equations. Similarly, the government of the host country might be aware of some sociological or institutional changes affecting some resident Diaspora, which are likely to impact the latter's ability to attract new migrants, which the econometrician does not know. Then, the reduced-form equation for aid is reflecting in its residuals this anticipation by the government in year t-1. The latter is then necessarily correlated with the random shock occurring in year t, by construction, if our behavioural assumption correctly captures the way the donor government is forming its anticipation.

The two aid variables are included in column (4), while only ODA is found significant and endogenous. Hence, ODA might not be worse than multilateral aid after all, suggesting that donors have found various methods for getting the required coordination for their other aid flows. After all, they have been in this line of business for about six decades, at least for many of them, so that the aid game might safely be approximated by an infinite-horizon repeated game. Then, it is known that this kind of settings is liable to foster cooperation between the players. Our findings thus suggest that donor countries are doing a pretty good job at equalizing the marginal impact of each kind of aid flow, so that aggregating them into one single ODA variable is legitimate for econometric purposes.

The foregoing econometric exercise thus concludes that two key results seem robust: (i) foreign aid has a significant negative impact on the migrations inflows into the donor

countries, and (ii) donors are actively using aid as a policy tool for reducing immigration. The third result that we tested, about the relative effectiveness of the aid flows coordinated through multilateral institutions and the other aid flows, turns out reject the view that bilateral aid is less effective.

5. Conclusion

This short paper has investigated the assumption that the donor countries are using foreign aid partly as a tool for controlling the inflow of migrants that they are facing. A brief theoretical analysis has been used to bring out the main predictions that can be derived from such an assumption. The model helped us identify the potential free-rider problem raised by this assumption, and suggested that donors must find a coordinated equilibrium if they want to optimize the impact of their aid as a tool for reducing immigration. Such a coordinated equilibrium requires the donors to find a way of "tying their own hands" in order to make their commitment not to renege ex post on their pledged disbursements credible. We suggested that in the real world, donors are in fact using various mechanisms for creating this credible commitment, ranging from the international definition of the Millenium Development Goals to the creation of powerful aid-dependent constituencies in their own countries. Techniques for developing the latter in the real world include, among others, policies like the tying of aid in favor of some powerful firms or the creation of an overstaffed aid administration. Moreover, they have created international aid institutions like the World Bank whose job is precisely to coordinate at least some of the aid flows.

The empirical tests performed using a panel of data from most DAC member countries have shown that our assumed aid-migration trade-off is indeed supported by the data. The empirical approach used for producing these findings is based on two requirements brought out by the theoretical analysis. First, it is important to include in the estimations various

control variables, which are liable to affect both the immigration flows and the aid disbursement flows. Second, due account must be taken of the fact that governments choose jointly the level of foreign aid that they deliver and the migration flow that they let in, so that the former must be regarded as endogenous in the econometric analysis. The findings of our econometric exercises provide quite a robust support for these two predictions. We further tested whether the amount of aid disbursed through a coordination mechanism, which we have proxied by the multilateral aid disbursements, is any more effective than the other aid flows, here captured by ODA disbursements. Our results suggest that total ODA is not performing any worse than its multilateral aid component after all, but this might reflect some econometric problems as these two variables are strongly correlated with one another. Therefore our econometric exercises fail to support the view that there is a significant free-rider problem with bilateral aid flows, and hence that there is a significant under-provision of aid in the world that we live in. Nevertheless, our tests of this assumption do not seem very powerful, and call for some further investigation of this issue. In particular, a finer dis-aggregation of aid flows might be required for performing a convincing analysis of this free-rider problem. This shows the way for future research.

Appendix: First-stage reduced form equations

	Log ODA Disbursements for eq.(2)	*Log* ODA Disbursements for eq.(4)	*Log* Multilateral Disbursements
Log Public Exp. On Order and Security	0.21*** (0.07)	0.21*** (0.08)	0.09 (0.11)
Percentage Right Wing in Parliament	-0.003 (0.002)	-0.002 (0.002)	0.01* (0.003)
Log Government Revenues	-	-0.06 (0.14)	-0.33* (0.19)
Unemployment Rate	0.03 (0.02)	0.03 (0.02)	-0.01 (0.02)
Social Expenditures (%)	-0.009 (0.013)	-0.01 (0.01)	0.02 (0.02)
Log Per Capita GDP	1.87*** (0.36)	1.95*** (0.38)	1.10*** (0.42)
Log Stock Foreign Population	0.04 (0.08)	0.05 (0.09)	0.23** (0.59)
Nb. Obs.	159	156	156
F -test	48.59	39.86	17.31

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