International economic assistance and migration: the case of Sub-Saharan countries

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ABSTRACT

Development aid is commonly advocated as one of the most effective instruments to reduce international migration. Nevertheless, empirical evidence shows that push factors do not automatically result in massive migrations and that aid policies systematically fail to meet their stated objectives. Recently, several contributions have argued that an increase in sending countries' wealth may lead to a rise in migration, rather than to a reduction, because it enables people to assume the costs and risks of migrating. However, despite the growing number of studies on this phenomenon, the role played by Official Development Assistance (ODA) has not received attention yet. This paper is aimed at providing empirical evidence on this specific issue. In particular, we investigate the relation between ODA and international migration rates of Sub-Saharan countries. We argue that ODA may have a positive effect on migration decisions for two reasons. First, ODA improves workers' ability to cover the costs of migration, by providing new job opportunities and in turn increasing incomes in the recipient country. Second, ODA, that is often associated with development programs in education, communication services and business opportunities, may also stimulate mobility aspirations of potential migrants. We develop an econometric analysis in order to investigate this hypothesis. Specifically, we perform a three-stage least square estimation on a sample of 48 Sub-Saharan countries. We build a two-equation model, so as to allow for endogeneity of ODA, and find that ODA has a positive and statistically significant effect on migration outflows. Thus, as our main contribution, we argue that development aids are not substitute for migration and that the traditional aid policies (such as those of the European Union), aimed at curbing migration by providing international financial aids, might need to be reconsidered.

JEL classification: F22, F35, O55.

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INTRODUCTION

The long-standing assumption of a negative relation between economic development and migration is not longer accurate. While traditional theories of international migration suggest that poverty and economic underdevelopment are the fundamental causes of migration (Ravenstein, 1889, Lee, 1966, Stark and Bloom, 1985), aid policies have generally failed to meet their stated objectives (Castles, 2004). A growing body of literature argues that, far from being paradoxical, this is the consequence of a misleading analysis of migration processes (Faini and Venturini, 1994, Martin and Taylor, 1996, Martin, 1998, Vogler and Rotte, 2000, Olesen, 2002). Indeed, an increase in sending countries' wealth may lead to a rise in migration, rather than to a reduction, because it enables people to assume the costs and risks of migrating. As a consequence, if the sending countries show high levels of poverty, international economic aids may actually result in increased migration outflows. While the same literature has addressed the relationship between international economic relations and migration in general, the role played by Official Development Assistance (ODA, hereafter) has not received attention yet. This paper is aimed at providing empirical evidence on this specific issue. In particular, we investigate the relation between ODA and international migration rates of Sub-Saharan countries.

Migration is a part of processes of social and economic change. People do not migrate simply to flee from poverty, but generally move in order to improve their social and economic living conditions. Thus, in order to migrate, people need financial resources as well as aspirations (De Haas, 2005). ODA may affect both these factors.

On the one hand, international migration is costly and risky. Migrants must pay for transportation and for living expenses until they find a job in the new country, and illegal immigrants often make payments to intermediaries also for services and information. For example, Schiff (1994) argues that migration costs may be a constraint on migration, especially when combined with imperfect capital markets, and Hatton and Williamson (2006) show that mobility costs reduce migration decisions of financially constrained migrants. As a consequence, foreign aid may improve workers' ability to cover the costs of migration, by providing new job opportunities and in turn increasing incomes in the recipient country.

On the other hand, it is widely recognized that migration is mainly driven by the feeling of relative deprivation rather than by absolute poverty. People's aspirations are strongly dependent on the global disparities in life perspectives, so that improvements in education and the access to information may enhance the propensity to migrate. ODA, that is often associated with development programs in education, communication services and business opportunities, may in fact stimulate mobility aspirations of potential migrants. Moreover, ODA contributes to build international networks, vehicles for social integration, and socio-economic channels that improve the migrants' capabilities to adapt to a new country, thus increasing the individuals' choice set.

Accordingly, the research hypothesis of this paper is that ODA by wealthy economies may have a positive effect on migration outflows of poor countries.

Sub-Saharan countries offer a well-suited case study in order to investigate the relation between ODA and international migration for several reasons. First, Sub-Saharan countries are one of the primary source areas of international migration. Second, they show patterns of migration and economic conditions that are very different from what traditional theories would predict (namely, countries with the lowest income generally do not exhibit the highest emigration rates). Third, Sub-Saharan countries for a long time have been recipient of aid policies aimed at reducing migration by addressing its alleged root causes, i.e. poverty and economic underdevelopment. Yet, strong push factors do not automatically result in massive migrations and aid policies systematically fail to meet their objective.

In order to investigate whether ODA that Sub-Saharan countries receive affects their emigration rates, we perform a three-stage least square estimation on a sample of 48 countries. In particular, we build a two-equation model so as to allow for endogeneity of ODA with respect to the internal economic conditions of individual countries and their international trade relations. Our empirical findings show that ODA has a positive and statistically significant effect on migration outflows, also controlling for those factors that are generally indicated as the most influential on mobility decisions. Thus, as our main contribution, we argue that development aids are not substitute for migration and that the traditional aid policies (such as those of the European Union) might need to be reconsidered.

This paper relates to the literature on the so-called "migration hump". In 1971, Zelinksy suggested a mobility transition hypothesis, in which he linked the concept of demographic transition to economic development and migration. In this theory, migration follows an inverted U-curve path through the phases of demographic transition. In particular, international migration should be at the pick in correspondence of an intermediate phase of economic development, when a rapid decline in mortality determines major population growth and migration pressure. Although the Zelinksy's theory constitutes in an a-historical model within a traditional modernization scheme, it also provides the first attempt to conceptualize migration as non-linear in time and economic growth. The intuition of Zelinsky has been further explored and developed by recent contributions. While some authors argue that migration is a phenomenon social in nature and that it is not purely determined by push and pull factors (Mitchell, 1989, Portes and Borocz, 1989, Zolberg, 1989), others explicitly focus on international economic relations as an important influence on migration patterns (see, e.g., Schiff, 1994, Martin, 1998, Vogler and Rotte, 2000) and find that economic growth – whether driven by trade liberalization, foreign direct investments and aids – might increase people's ability to migrate abroad (Faini and Venturini, 1994, Martin, 1993, Martin and Taylor, 1996, Olesen, 2002). So that, this literature argues, economic development is likely to lead to more migration from poor countries in the short/medium term.

Our paper is aimed at providing an empirical contribution to such a literature, offering some evidence from real data. However, it is worth emphasizing that we do not investigate time patterns of migration outflows of a given country along with ODA that the same country receives, rather we develop a cross-country analysis in order to assess whether ODA is actually relevant in explaining the variability of the migration outflows across countries.

The remainder of the paper is structured as follows. In the following section some descriptive statistics on the relation between ODA and migration outflows of Sub-Saharan countries are introduced. Then, we present the data used in the empirical analysis, the econometric specification and the estimation results. Concluding comments are offered in the last section.

STYLIZED FACTS AND HYPOTHESIS

Sub-Saharan countries show patterns of migration flows very different from what the traditional push-pull factors theory would predict: poverty and economic underdevelopment do not result in massive migrations, rather countries with low income exhibit also low emigration rates. Data provided by the Organization for Economic Cooperation and Development (OECD, 2008) indicate that the emigration rates of Sub-Saharan countries vary widely across them. In particular, OECD uses data from national census of population and calculates the emigration rate from a given country of origin by dividing the expatriate population (aged 15+) from that country by the native-born population (aged 15+) of the same country. Exploring these data (which refer to 2004), we note that the highest emigration rate is that of Capo Verde (25.5%) and the lowest is that of Niger (0.09%). Only 5 countries (Capo Verde, Seychelles, Sao Tome, Mauritius and Comoros) have an emigration rate greater than 5%, while countries with a larger population have, in general, a lower emigration rate. Table 1 presents a list of 48 Sub-Saharan countries and their emigration rates.

[*Table 1 about here*]

Moreover, as we have mentioned above, differences in emigration rates do not seem to be dependent on the main internal socio-economic characteristics of individual countries. For example, the two Sub-Saharan countries with the highest emigration rate (Cape Verde and Seychelles) show relatively high values of Human Development Index (HDI): respectively 0.73 and 0.84. At the opposite, two of the countries with the lowest emigration rates (Niger and Burkina Faso) show relatively low values of HDI: 0.37 in both cases.

Several studies have tried to identify the main determinants of emigration flows from Sub-Saharan countries. While some of them focus on the role played by push factors, such as poverty and political instability (e.g., Adepoju, 1994, and Oucho, 1995), others have recognized that migration flows of Sub-Saharan countries do not substantially follow the fluctuations of differential opportunities across economies, but tend to depend on social and economic networks across national borders (see, for

instance, Black et al., 2004). Following some of the intuitions of the migration hump theory, we believe that also ODA may be an influence on international emigration from Sub-Saharan nations.

OECD (1996, 2009) defines ODA as those flows to eligible ODA recipients or multilateral institutions that are administered with the promotion of the economic development and welfare of developing countries as its main objective. As we have argued in the introduction, there are two reasons why ODA may positively affect migration decisions of people. Firstly, ODA is likely to increase income from labor and in turn to improve workers' ability to cover the costs of migration. Secondly, ODA contributes to build international socio-economic networks and it might so enhance the propensity to migrate. As a consequence, the higher the level of ODA that a given wealthy economy directs to a poor country, the higher may be the migration flow from the latter to the former.

Let us consider, for example, the case of France, which has strong cultural and economic relationships with many Sub-Saharan countries. For many years French-Senegalese co-development plans have tried to reverse the exodus of Senegalese, by enhancing business opportunities in Senegal within economic aid programs. Such initiatives also promoted the voluntary return of Senegalese by providing assistance to migrant workers for reinsertion, in the forms, among others, of credit funds and training-for-return programs (Diatta and Mbow, 1999). Nevertheless, migration flows from Senegal to France have showed no signs of reduction, but rather they increased from 910 individuals in 1996 to 2550 individuals in 2004 (source: OECD, 2008). In our opinion, one of the explanatory factors of this phenomenon is ODA. Figure 1 shows levels of net ODA (expressed in millions of US dollars) directed from France to some Sub-Saharan countries and migration flows (expressed in number individuals) from these countries to France (data refer to 2004), where net ODA comprises contributions of donor government agencies, at all levels, to developing countries ("bilateral ODA") and to multilateral institutions, and disbursements by bilateral donors and multilateral institutions, while lending by export credit agencies - with the pure purpose of export promotion - is excluded (OECD, 2008).

[*Figure 1 about here*]

The two variables' patterns are surprisingly similar. In particular, because of data availability constraints, we consider three France's ex-colonies (Senegal, Madagascar and Togo), one Portugal's ex-colony (Uganda) and one UK's ex-colony (Angola). Across them (as well as within the group of the three France's ex-colonies) ODA and emigration flows seem to be linked by a positive relation.

Moving from the point of view of the ODA donor country to that of the recipient, the picture does not change substantially, but it appears even clearer. Because of data availability constraints, again, we consider only a few Sub-Saharan recipient countries and their major donor partners. Specifically, Figure 2 reports the levels of ODA received (expressed in millions of US dollars) from given countries and migration outflows (expressed in number individuals) towards these individual countries, for Kenya, Democratic Republic of Congo, Senegal, Togo, Uganda and Madagascar. Also in this case, ODA and migration follow a similar cross-country pattern.

[*Figure 2 about here*]

From such an evidence, it emerges the suspect that international aids and migration outflows are actually linked. However, this descriptive presentation of data does not allow us to deduce whether the relation of causality goes from ODA to migration or vice-versa and whether it is statistically significant or not. Thus, we go deeper and, in the following sections, develop an inferential analysis.

DATA DESCRIPTION AND ECONOMETRIC SPECIFICATION

Before going to the econometric specification, let us make clear what precisely we want estimate. The aim of the econometric study is to investigate if ODA is relevant (from a statistical point of view) in explaining the variability of the migration outflows across Sub-Saharan countries. Unfortunately, disaggregated data on ODA (according to donor country) and on emigration rates (according to destination country) are not available for all Sub-Saharan countries. Therefore, in order to perform an econometric estimation, we are forced by the data availability to pose some limitations to our analysis. On the one hand, we consider total ODA (as a sum of ODA from all donor countries) received by

individual Sub-Saharan countries; on the other hand, we look at migration outflows (expressed in emigration rates, as defined by OECD – see the previous section –) from individual Sub-Saharan countries to any destination country. These limitations, however, lead us to more general results, as they allow us to investigate the effect of ODA received on total migration outflows from a given country, without focusing on one specific destination only.

We construct the sample according to the following procedure: firstly, we define dependent and independent variables, then we choose the control variables.

On the one hand, we use the country-specific emigration rate (calculated by dividing the expatriate population, aged more than 15, from a given country by the native-born population, aged more than 15, of the same country; source: OECD, 2008) as dependent variable. On the other hand, we specify the emigration rate as a function of the total net ODA (in US dollars) received by the individual country weighed by its GNI. The most basic question for using economic variables like ODA is which denominator best represents the importance of ODA for receiving countries, in order to make valid inter-country comparisons. In this paper, we weight ODA by the GNI. Indeed, the relevance of ODA for the recipient country is mainly dependent on its economic size and the GNI offers a generally accepted measure of it (notice that unreported estimations, performed using the country's population as a weight for ODA, show substantially similar final results). Nevertheless, ODA is likely to be endogenous. In particular, the level of ODA may be dependent on the internal economic conditions of the recipient country (if ODA donors direct higher levels of ODA towards those countries that show higher poverty) and on the international economic relations between poor and wealthy economies. For this reason, we consider ODA as an endogenous variable so as to increase the overall robustness of the results. Specifically, in our model, ODA is allowed to react to the country's GNI per capita (source: World Bank, 2008), poverty (measured by the human poverty index by UN, 2008) and merchandise trade as percentage of GDP (measured as the sum of merchandise exports and imports divided by the value of GDP; source: World Bank, 2008). Figure 3 reports levels of emigration rates and net ODA (weighted by the GNI) for the considered 48 Sub-Saharan countries (notice that, even if the relation

between the two variables appears weak from a descriptive point of view, it may well be statistically significant).

[*Figure 3 about here*]

The selection of the control covariates is a crucial issue, indeed only avoiding misspecification problems the reliability of the results can be guaranteed. Since, in our analysis, we try to explain differences in emigration rates between source countries, we do not really need to include pull factors in the econometric model; thus, we mainly focus on push factors. In general, the push factors concern the country's living conditions. Given data availability constraints, we choose three main aspects shaping living conditions of people in Sub-Saharan countries: poverty, human development and war. We measure poverty and human development by using, respectively, the human poverty index (HPI, hereafter) and the human development index (HDI, hereafter) provided by the UN Statistical Database (UN, 2008). While the HPI includes the probability at birth of not surviving at age 40, the adult illiteracy rate, the percentage of population not using an improved water source and the percentage of children under weight-for-age, the HDI is composed by a life expectancy index, an education index and GDP per capita. In order to control for the presence of war, we consider a dummy variable which takes a value of 1 for those countries that are involved in war or conflicts according to a generally accepted map of African conflict areas (see Unicef, 2009). Moreover, we include in our operative model also two proxies for the people's access to international news and political information. We consider, on the one hand, the number of internet users as a percentage of the entire population (source: World bank, 2008), on the other hand, the number of televisions per 100 inhabitants (television with its images of the "wealthy west" may have a strong influence on people's desire to migrate; in this case the source of data is the International Telecommunication Union – ITU – 2008). Finally, we include a set of dummy variables in order to control for the effects of the last colonizer countries (Portugal, Spain, United Kingdom, Belgium, Italy and France), in an attempt to assess the potential influences due to different systems of past and present political international relations. Table 2 presents a descriptive analysis of

the sample used in the empirical estimation (the variables are referred to 2004, the most recent possible in order for valid inter-country comparisons to be made; the sample covers 48 countries).

[*Table 2 about here*]

As Table 2 shows, the net weighted ODA is widely variable across countries. On the one hand, Liberia registers the highest value (0.265) and Burundi (0.154) and Democratic Republic of Congo (0.133) follow. On the other hand, South Africa, Botswana and Mauritius are at the bottom of the distribution with a net weighted ODA lower than 0.003. The average GNI per capita is 2400 US dollars; in particular, the richest country is Seychelles (more than 11000 US dollars) and the poorest are Liberia and Democratic Republic of Congo (240 US dollars). On average, Sub-Saharan countries do merchandise trade for more than 60% of their GDP, and only four countries (Equatorial Guinea, Lesotho, Mauritania, Seychelles and Swaziland) trade for an overall value greater than their GDP. The synthetic indexes of human development and poverty are in general low: the mean of the former is 0.51 (while, for example, for all the European countries it is greater than 0.9) and the mean of the latter (that is normalized between 0 and 100) is about 37. Fifteen countries result involved in a war. The use of internet is very low spread among Sub-Saharan countries: on average only 2.58 individuals every 100 individuals are internet users and only three countries have more than ten internet users every 100 individuals (Seychelles, Sao Tome, Mauritius). The number of televisions per 100 inhabitants is, on average, 6.96 (the lowest value is that of Rwanda and the highest that of Sudan). Finally, 19 countries were colonies of United Kingdom, 18 of France, 5 of Portugal, 3 of Italy, 2 of Belgium and 1 of Spain.

Formally, we consider the following cross-country two-equation model:

$$ER_i = \beta_0 + \beta_1 ODA_i + \beta_2 HPI_i + \beta_3 HDI_i + \beta_4 WAR_i + \beta_5 INTERNET_i + \beta_6 TV_i + \beta_7 COLONY_i + \varepsilon_i \quad (1)$$

$$ODA_i = \gamma_0 + \gamma_1 HPI_i + \gamma_2 GNI_i + \gamma_3 TRADE_i + \upsilon_i \quad (2)$$

where symbols have the following meaning: ER_i (emigration rate), ODA_i (net official development assistance weighted by the country's gross national income), HPI_i (human poverty index), HDI_i (human development index), WAR_i (presence of war or conflicts), $INTERNET_i$ (internet users as a percentage of

total population), TV_i (number of televisions per 100 inhabitants), $COLONY_i$ (last colonizer country), GNI_i (gross national income per capita), $TRADE_i$ (merchandise trade as a percentage of GDP), the vectors $\beta = [\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7]$ and $\gamma = [\gamma_0, \gamma_1, \gamma_2, \gamma_3]$ define the parametric structure (in particular β_0 and γ_0 are the two model constants), while ε_i and υ_i are the error terms. Variables' descriptions are given above in this section. Given the small number of observations, we start considering an abridged version of the model and progressively add the controls, so testing the estimation robustness and controlling for multi-collinearity problems due to potential correlation between covariates. As equations (1) and (2) show, we allow ER_i to react to ODA_i and, simultaneously, ODA_i to react to HPI_i, GNI_i and $TRADE_i$. Consequently, ε_i is likely to be correlated with ODA_i. Thus, we jointly estimate the two equations using a three-stage least square procedure. In this way, we try to control for the potential endogeneity of ODA_i with respect to some variables that in turn may influence ER_i.[1] Notice that we cannot include ER_i directly in equation (2) as a covariate, since this would make to deduce the structural parameters from the known reduced form parameters impossible (i.e. the so-called identification problem).

ESTIMATION RESULTS

Table 3 and Table 4 report the estimation results of, respectively, abridged and extended model specifications. In both tables, while the first column reports the variables, the remaining columns report the estimated parameters of the various model specifications. The two-equation parameters, simultaneously estimated, are reported in succession.

[*Table 3 about here*]

[*Table 4 about here*]

The parameter estimates are broadly stable across the various specifications. As one can notice, our hypothesis of a statistically significant effect of ODA on migration outflows finds strong support in the

data. Indeed, all the model specifications (a), (b), (c), (d), (e), (f) and (g) that we consider, reported respectively from the second to the fifth column of Table 3 and from the second to the fourth column of Table 4, show that the level of net ODA (weighted by the country's GNI) that an individual country receives has a positive and statistically significant effect on the migration rate of the same country. In a three-stage least square estimation, the estimated coefficients can be considered as marginal effects, thus we can calculate that, for example, an increase of one dollar of ODA every 100 dollars of GNI increases the emigration rate from 0.2 percent, as in model specification (d), to 11.1 percent, as in model specification (g). Moreover, we find that the level of ODA that a country receives depends on its poverty (as measured by the human poverty index), on its GNI per capita and on its economic openness. Specifically, the model specifications (a), (c), (f) and (g), reported respectively in the second and fourth column of Table 3 and in the third and fourth column of Table 4, show that the HPI has a positive and statistically significant effect on ODA; the model specifications (a), (b), (c), (d), (e), (f) and (g), reported respectively from the second to the fifth column of Table 3 and from the second to the fourth column of Table 4, show that the GNI per capita has a negative and statistically significant effect on ODA; and the model specifications (b), (d) and (e), reported respectively in third and fifth column of Table 3 and in the second column of Table 4, show that the merchandise trade (as a percentage of GDP) has a positive and statistically significant effect on ODA. Finally, in the model specifications (c), (f) and (g), reported respectively in the fourth column of Table 3 and in the third and fourth column of Table 4, the variable $TRADE_i$ does not come out as statistically significant because of correlation problems with the other two variables considered in equation (2).

Other interesting results are obtained. All the considered model specifications unveil that the country's poverty (measured by the HPI) has a negative and statistically significant effect on the country's emigration rate, while the economic development (measured by the HDI) has a positive and statistically significant effect. These latter findings corroborate our research hypothesis, by showing that the material deprivation may negatively affect people's ability to migrate and that the economic development may open socio-economic channels relevant on mobility decisions. These results are also consistent with the migration hump theory (Martin and Taylor, 1996, Martin, 1998, Vogler and Rotte,

2000, Olesen, 2002), indeed they show that, in a relatively poor sending country (such as Sub-Saharan countries), an increase in the economic conditions of people has a positive impact on the propensity to migrate, because the financial constraints of the poorest become less binding.

We also find that the use of internet and of the television by Sub-Saharan individuals has a positive and statistically significant effect on their probability of emigrating. On the one hand, by using internet, people have access to international news and political information. On the other hand, the television, which opens a window on the living standards of wealthy economies, may have an influence on people's desire to migrate. Notice that the variable TV_i turns out as statistically significant only in the model specification (d), where the variable $INTERNET_i$ is not included, since the two variables show a positive correlation. Surprisingly, the variable WAR_i does not show a statistically significant effect on emigration rates, what is probably due to the fact that the presence of war and conflicts mainly affect internal and regional migration rather than international mobility.

In conclusion, the last colonizer country does not emerge as a substantial influence on emigration rates. Nevertheless, it is worth emphasizing that, in our econometric analysis, we consider migration outflows to any destination country, so that the effect of economic and political bilateral relations between couples of individual countries of origin and destination is not assessed by this estimation.

We have performed a diagnostic analysis of both the estimation strategy and results. First, we have implemented the Sargan test of the overidentifying restrictions on equation (2), in order to evaluate if the instrumental variables used in equation (2) (namely, HPI_i, GNI_i, and $TRADE_i$) have a statistically significant role in explaining the cross-country variation of ODA. The test results lead us to not reject the null hypothesis (at the conventional level of significance, 5%), thus the instrumental variables used in equation (2) pass the test and they are statistically validated. Second, as an overall diagnostic procedure, we have performed the Wald test on all the model specifications; the test results, notwithstanding the small number of observations, lead us to reject the null hypothesis of joint non statistical significance of all the parameters. Statistical details of the abridged model specifications are reported in Table 3, while those of the extended model specifications are collected in Table 4.

CONCLUSIONS

Restrictive immigration policies by the European countries have largely failed to curb migration from Africa. In response to these failures, development aid is commonly advocated as a "smart solution" (De Haas, 2004). It is often argued, indeed, that only economic development can reduce migration from poor countries, given that the root causes of migration are poverty and differentials in economic opportunities between source and destination countries (see, for example, Ruebens, 1983). Yet the relation between migration and international economic aids seems to be more problematic than a large literature believes. Many studies have already pointed out that development-enhancing policies are not substitutes for migration, rather they may enable people to assume the costs and risks of migrating, by increasing people's financial and social capabilities to move abroad (e.g., Schiff, 1994, Martin and Taylor, 1996, Martin, 1998, Vogler and Rotte, 2000). In this paper, we have focused on Official Development Assistance (ODA). We have performed a three-stage least square estimation on a sample of 48 Sub-Saharan countries and showed that ODA has a positive and statistically significant effect on migration outflows. We interpret this result arguing that, on the one hand, ODA may improve workers' ability to cover the costs of migration, by providing new job opportunities and in turn increasing incomes in the recipient country, on the other hand, ODA, that is often associated with development programs in education, communication services and business opportunities, may also stimulate mobility aspirations of potential migrants. Notice that, while we have provided some evidence on the similarity of patterns of ODA and migration flows between couples of individual countries of origin and destination, the econometric analysis, given data availability constraints, is performed by using aggregated data on total net ODA received by individual Sub-Saharan countries and on migration outflows to any destination country. Thus, our estimation results do not allow us to argue that there is a statistical relation between the level of ODA that one wealthy economy directs to a given recipient country and the number of immigrants from the same recipient country towards the given donor; but they only show, more generally, that total net ODA has a positive and statistical significant effect on aggregated migration outflows. We also find other two interesting relations. First, we show that ODA cannot be taken as an exogenous variable, while it is strongly dependent on the level of the recipient's

poverty and economic openness, in such a way that the higher the level of a country's poverty and economic openness, the higher the level of ODA that the same country receives. Second, emigration rates are positively affected by the country's economic development and negatively affected by its poverty, what contrasts the prediction of the traditional push-pull factors theory (Ravenstein, 1889, Lee, 1966, Stark and Bloom, 1985). In our opinion, these findings have a strong policy implication. Specifically, they corroborate the argument that international development aids are not substitute for migration and suggest that there is a considerable gap between certain theories and empirical evidence. Therefore, migration policies shaped on the traditional belief that economic development will eliminate the economic incentives to emigrate should be reconsidered: in a context of deep poverty, a modest increase of personal resources may be not enough to guarantee people's fulfillment, while it may enhance people's financial resources, that can be used to migrate, as well as aspirations to do so. Migration policies based on empirical evidence would probably be more effective.

NOTES

[1] Let us call $X = [X_1, X_2]$ the matrix of regressors, where X_1 is a matrix composed of variables assumed exogenous with respect to the emigration rate, while X_2 is made of m variables that are suspected to be endogenous in the model (ODA in this case). Select a number $k \geq m$ of instrumental variables Z that satisfy the two fundamental requirements that $\text{Cov}(Z, X_2) \neq 0$ (relevance) and $\text{Cov}(Z, \zeta) = 0$ (exogeneity). Then a system 2SLS is implemented, where, in the first stage, X_2 is regressed over Z and a constant. The parameter estimates so generated are then saved and used to form a consistent estimate of the covariance matrix of the disturbances ζ that allows for correlation of the residuals across the equations of the system. The covariance matrix is finally adopted as a weighting matrix to re-estimate the system and get the new values of the parameters in the last step. The last two steps are iterated over the estimated disturbance covariance and parameter estimates until the parameter estimates converge.

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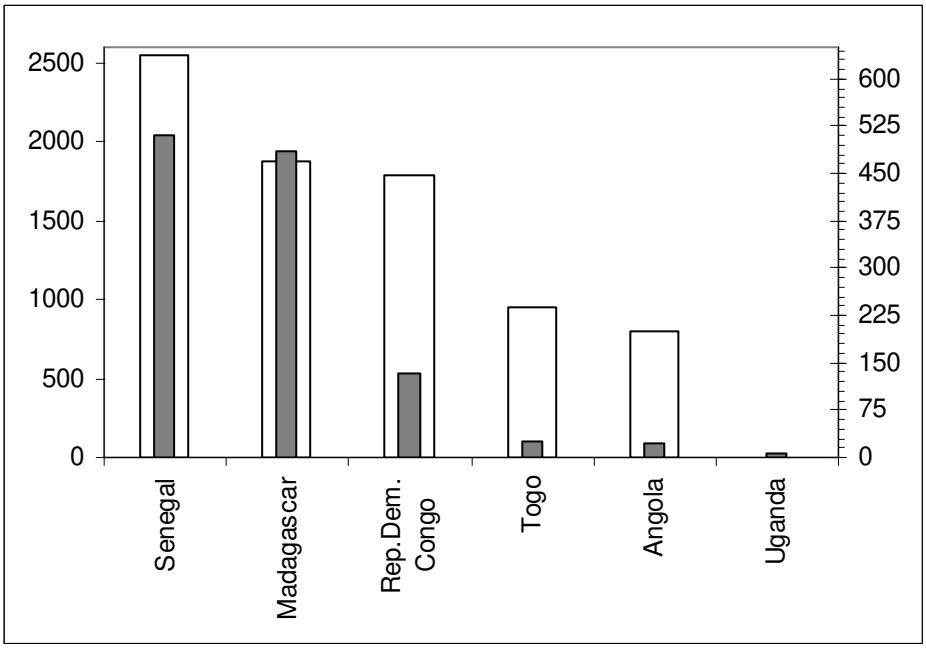
Table 1. Emigration rates of Sub-Saharan countries (population 15+, year 2004).

Country	Emigration rate	Country	Emigration rate
Cape Verde	25.55	Mali	0.77
Seychelles	12.40	Togo	0.71
Sao Tome and Principe	11.34	Côte d'Ivoire	0.69
Mauritius	9.33	Uganda	0.68
Comoros	5.19	Cameroon	0.65
Equatorial Guinea	4.43	Zambia	0.64
Guinea-Bissau	3.62	Guinea	0.48
Congo	3.53	CtralAfricanRep.	0.45
Somalia	2.86	Botswana	0.44
Angola	2.85	Benin	0.41
Gambia	2.58	Dem. Rep. of Congo	0.38
Senegal	2.44	United Rep. of Tanzania	0.37
Liberia	2.30	Randa	0.37
Eritrea	2.02	Nigeria	0.36
Ghana	1.47	Ethiopia	0.36
Sierra Leone	1.42	Swaziland	0.34
Gabon	1.42	Namibia	0.31
Djibouti	1.39	Burundi	0.28
South Africa	1.14	Malawi	0.26
Kenya	1.13	Sudan	0.22
Zimbabwe	1.09	Chad	0.15
Mauritania	0.97	Burkina Faso	0.14
Madagascar	0.87	Lesotho	0.10
Mozambique	0.82	Niger	0.09

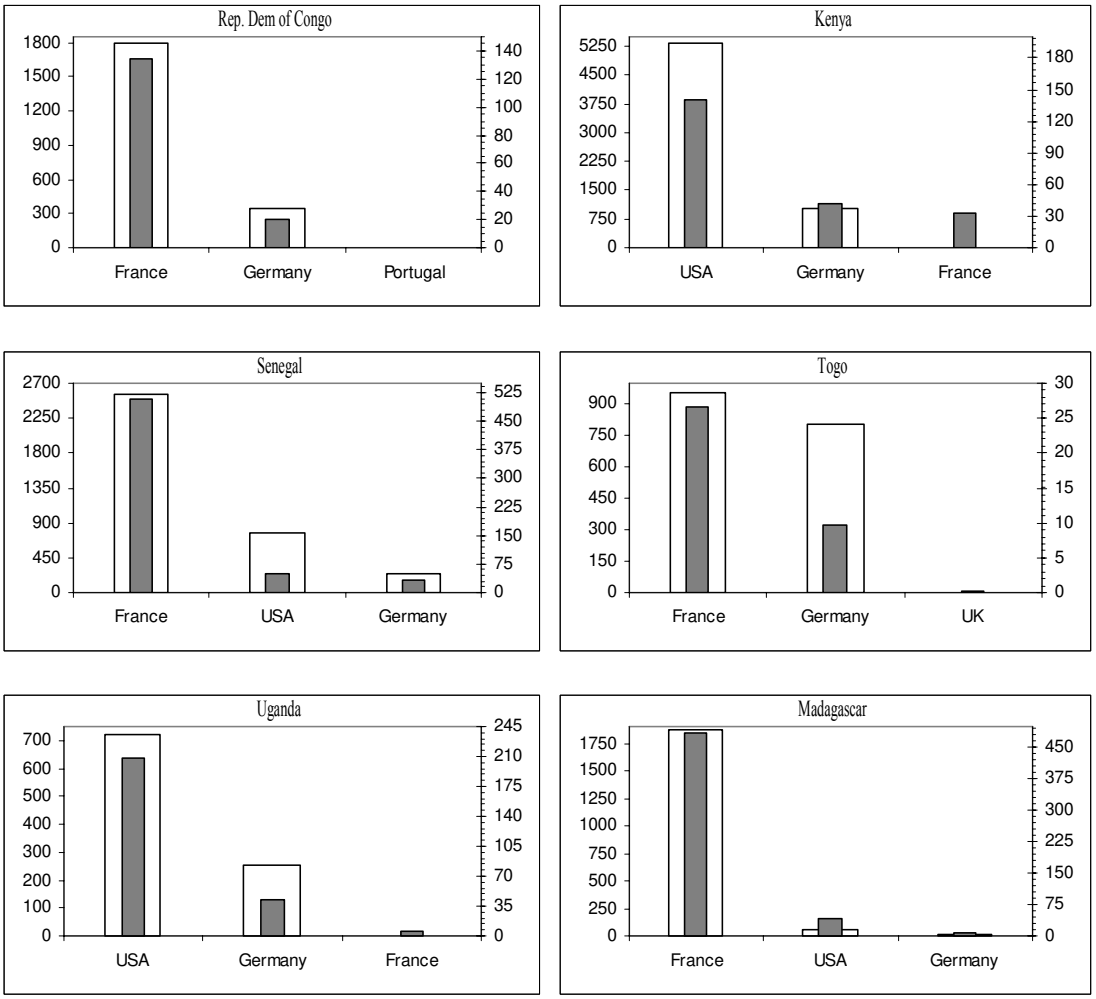
Source: OECD, 2008.

Figure 1. France's ODA in USD millions to given countries - grey, right scale - and migration flows to France in individuals - white, left scale - (year 2004).



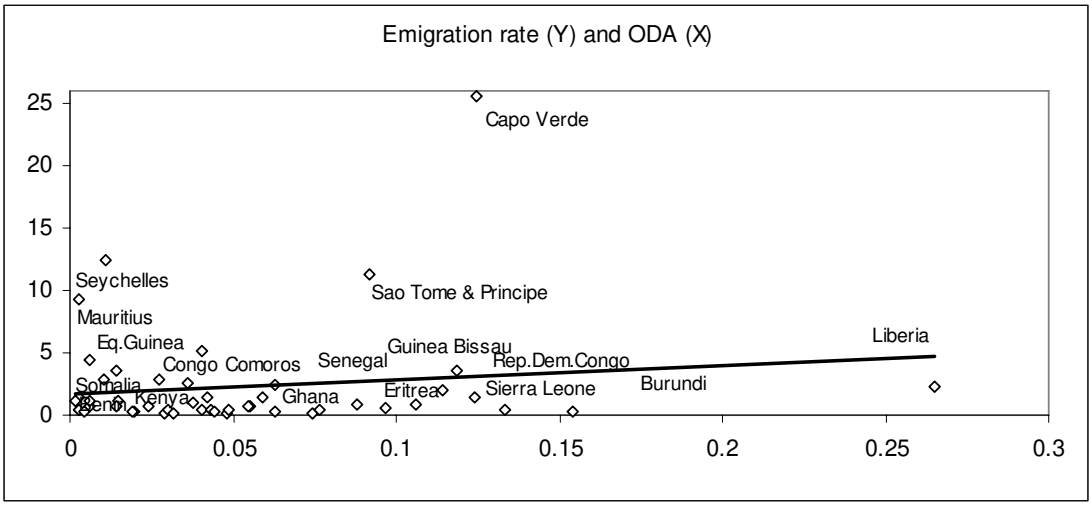
Source: OECD, 2008.

Figure 2. Migration flows in individuals from given countries - white, left scale - and ODA in USD millions to the same country (from given donors) - grey, right scale - (year 2004).



Source: OECD, 2008.

Figure 3. Emigration rates and net ODA weighted by GNI (year 2004).



Source: OECD, 2008.

Table 2. Sample description (48 Sub-Saharan countries, year 2004).

Variable	Min	Max	Mean	(St.Dev.)
Emigration rate	0.09	25.55	2.33	(4.35)
Net ODA/GNI (US dollars)	0.01	0.26	0.05	(0.05)
Internet users (%)	0.00	24.00	2.58	(4.69)
GNI per capita	240	11430	2419	(3077)
Trade (% GDP)	19.00	163.00	63.62	(32.26)
Human development index	0.34	0.84	0.51	(0.11)
Human poverty index	11.40	56.90	37.38	(10.57)
Number of televisions (100 inh.)	0.01	38.60	6.96	(8.72)
Presence of war or conflicts	0	1	0.33	(0.48)

Source: OECD, 2008.

Table 3. Cross-country estimation results (3SLS): abridged model versions.

VARIABLE	MODEL (a)	MODEL (b)	MODEL (c)	MODEL (d)
Eq. 1. Dep. Var. : ER_i	Coef. (Std.Err.)	Coef. (Std.Err.)	Coef. (Std.Err.)	Coef. (Std.Err.)
ODA_i	58.551	44.935	53.634	20.897
	(20.884) ***	(20.573) **	(20.732) ***	(13.039) *
HPI_i	-0.154	-0.106	-0.803	--
	(0.035) ***	(0.036) ***	(1.027) ***	
HDI_i	8.922	6.887	8.462	--
	(2.828) ***	(2.799) **	(2.817) ***	
WAR_i	-0.803	-0.869	-0.803	-1.924
	(1.022)	(1.050)	(1.027)	(1.280)
$INTERNET_i$	0.359	0.366	0.361	--
	(0.128) ***	(0.132) ***	(0.129) ***	
TV_i	--	--	--	0.224
				(0.053) ***
Eq. 2. Dep. Var. : ODA_i	Coef. (Std.Err.)	Coef. (Std.Err.)	Coef. (Std.Err.)	Coef. (Std.Err.)
HPI_i	0.001	--	0.001	--
	(0.001) ***		(0.001) ***	
GNI_i	-0.001	-0.001	-0.001	-0.001
	(0.001) **	(0.001) ***	(0.001) **	(0.001) ***
$TRADE_i$	--	0.001	0.001	0.001
		(0.001) ***	(0.001)	(0.001) ***
Statistical details:				
Wald test (eq. 1): *p*-value	0.000	0.000	0.000	0.000
R-square (eq. 1)	0.501	0.580	0.536	0.401
Wald test (eq. 2): *p*-value	0.000	0.000	0.000	0.000
R-square (eq. 2)	0.553	0.428	0.560	0.428
Sargan test [*p*-value]	3.734 [>5%]	2.090[>5%]	2.090 [>5%]	1.765 [>5%]

Note: level of confidence of statistical significance ("*" = 90%, "**" = 95%, "***" = 99%).
Source: OECD, 2008.

Table 4. Cross-country estimation results (3SLS): extended model versions.

VARIABLE	MODEL (e)	MODEL (f)	MODEL (g)
Eq. 1. Dep. Var. : ER_i	Coef. (Std.Err.)	Coef. (Std.Err.)	Coef. (Std.Err.)
ODA_i	43.449	107.327	111.033
	(21.718) *	(29.705) ***	(32.397) ***
HPI_i	-1.109	-0.239	-0.255
	(0.036) ***	(0.038) ***	(0.038) ***
HDI_i	7.427	13.497	14.380
	(3.486) **	(3.420) ***	(3.996) **
WAR_i	-0.801	-0.482	-0.316
	(1.106)	(0.874)	(0.955)
$INTERNET_i$	0.375	0.385	0.404
	(0.134) ***	(0.113) ***	(0.111) ***
TV_i	-0.021	--	-0.042
	(0.079)		(0.070)
$BELGIUM_i$	--	-3.164	-3.212
		(2.833)	(2.876)
UK_i	--	-3.130	-2.913
		(1.527) **	(1.609) *
$FRANCE_i$	--	-1.688	-1.580
		(1.524)	(1.526)
$SPAIN_i$	--	2.741	3.070
		(3.056)	(3.076)
$PORTUGAL_i$	--	2.825	3.068
		(2.393)	(2.636)
$ITALY_i$	*benchmark*	*benchmark*	*benchmark*
Eq. 2. Dep. Var. : ODA_i	Coef. (Std.Err.)	Coef. (Std.Err.)	Coef. (Std.Err.)
HPI_i	--	0.001	0.002
		(0.001) ***	(0.001) ***
GNI_i	-0.001	-0.001	-0.001
	(0.001) ***	(0.001) *	(0.001) *
$TRADE_i$	0.001	-0.001	0.001
	(0.001) ***	(0.001)	(0.001)
Statistical details:			
Wald test (eq. 1): *p*-value	0.000	0.000	0.000
R-square (eq. 1)	0.586	0.100	0.194
Wald test (eq. 2): *p*-value	0.000	0.000	0.000
R-square (eq. 2)	0.428	0.548	0.546
Sargan test [*p*-value]	2.074 [>5%]	4.655[>5%]	4.743[>5%]

Note: level of confidence of statistical significance ("*" = 90%, "**" = 95%, "***" = 99%).
Source: OECD, 2008.