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The determinants of selection and allocation decisions for health assistance. Which role do health indicators play?

The determinants of selection and allocation decisions for health assistance. Which role do health indicators play?

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Abstract

This paper analyzes the selection and allocation decisions of major and like-minded bilateral donors as regards development assistance for health for the period of 1990 till 2007. The central question is to what extent health indicators, reflecting the health objectives stated in the Millennium Development Goals, influence such decisions. The analysis reveals that health indicators are important determinants of the selection and allocation process for health assistance but to a different degree at the two stages; HIV prevalence is the proxy with the strongest impact. The results also show that the quality of the institutional environment and the bilateral relations affect the decisions of many donors. The national health expenditures, however, have no systematic effect and the allocation pattern of possible competitors is irrelevant for almost all donors. The evidence illustrates, furthermore, the great heterogeneity among major and like-minded donors as well as the differences between selection and allocation stage.

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1. Introduction

The Millennium Development Goals (MDGs) state three health objectives: reduction of child mortality, improvement of maternal health and fight of HIV/Aids, malaria and other. Such explicit formulation suggests global health objectives to be of high priority for donors, and as equally important as education or poverty reduction. In fact, the share of aid for the social sector rose from about 20 percent at the beginning of the 1990s to about 35 percent in the mid-2000s, among them higher spending on health (Thiele et al. (2007), 600). However, even the donors with the most progressive aid programs distributed much less aid to the most populous and deprived countries than indicators, for instance, on under-five mortality would suggest (Baulch (2006), 944).

The specific focus of this paper is to analyze to what extent the selection and allocation decision for development assistance for health of the most important bilateral donors are based on health indicators of the potential recipients. We also include variables that describe the institutional environment in the receiving country, the recipient's efforts for the national health system, competition among donors and the donor-recipient bilateral relations. A lognormal hurdle model is used with dyadic data from 10 donors to 160 recipients for the period between 1990 and 2007. The separate analysis of the two decision stages sheds light on the importance of health indicators and other factors for health assistance. In addition, the analysis at donor level allows studying the individual behavior at each stage and identifying systematic differences among the groups of major and like-minded donors. The major donors France, Germany, Japan, Spain, the United Kingdom and the United States are commonly regarded as pursuing their own political and strategic interests or as being bound by their colonial past (Svensson (1999): 291, 293).[1] The so-called like-minded donors Canada, Denmark, the Netherlands, Norway, and Sweden are traditionally viewed as being committed to the development needs of the recipient countries (Neumayer (2003a), 658).

The aim of this paper is three-fold. First, to the best of our knowledge, this study is the first analysis of development assistance for health. Second, we analyze the decision-making process at individual donor level. Third, we derive novel findings based on the separate analysis of the determinants for the selection and the allocation process. The analysis is structured in the following way. In the next section, the empirical strategy including the main variables of interest is elaborated. In Section 3, methodological issues in modeling the decision process, the estimation method employed and the dataset are described. Section 4 presents the main estimation results and robustness checks, and discusses the results. The paper ends with concluding remarks in Section 5.

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[1]   Typically, Italy is considered a big donor. Here, we have included Spain instead. As far as allocation of health assistance is concerned, Spain is a rather large donor with a provision of $1.3 billion.

2. Background

The analysis presented in this paper naturally complements and builds on the existing literature on aid determinants. The consensus in the more recent literature is that many aspects influence the aid allocation decision, among them donor interest and development criteria. The literature on the driving factors of the selection process is relatively scarce, but the available findings show that an often assumed congruency between the two groups of determinants is at least misleading because the motives for selection respectively allocation can be very different. Dudley and Montmarquette (1976) introduced the idea of a two-step decision-making procedure with an explicit distinction between the selection and allocation decision. Svensson (1999) analyzes the question whether aid is channeled to more democratic countries. Following the idea of a two-stage selection model of foreign assistance, the selection decision is estimated using a probit model with random effects and the aid allocation is estimated via ordinary least squares (OLS). The findings suggest that the individual donor decision is driven by different motives. Questioning the importance of human rights in the decision-making process of bilateral donors, Neumayer (2003a) uses a two-part model to analyze the selection decision via probit estimation with random effects and the allocation decision via OLS. The results suggest that some variables have a similar significant effect on both decision stages (e.g. income per capita, population size, former colony), no significant effect (e.g. distance), or a significant effect only on the allocation decision (e.g. economic ties). The same technique is used in Neumayer (2003b) to analyze the impact of good governance on development assistance. The results suggest considerable differences between the two decision stages but also among bilateral donors. Berthélemy (2006) analyzes the individual behavior of bilateral donors with respect to their allocation decisions, using Heckman and a two-part model, in which fixed effects are introduced only in the allocation equation. However, the results of the selection equation are not reported due to methodological and computational difficulties.

The early influential empirical study on aid allocation by McKinlay (1979) shows that the combination and the intensity of interests pursued are different for the UK, France, Germany and the US. Focusing on bilateral aid to the African continent, the cross-country analysis of Schraeder et al. (1998) shows that American, Japanese, French and Swedish allocation pattern is influenced by donor interests that depend on the historical background and their position in the global system and by ideology, strategic interests and trade relationships. The influential study by Alesina and Dollar (2000) finds that political and strategic considerations of the donor are as important as or even more important than the recipient's policy or political institutions. In addition, the individual analysis reveals major differences among donors. The results by Burnside and Dollar (2000) for the allocation of bilateral aid as a share of GDP show that smaller and poorer countries receive more aid. Measures of good policy, arms imports or the geographic location in sub-Saharan Africa, the Franc zone or Central America are insignificant. Dollar and Levin (2006) finds that aid allocation has increasingly become selective: At the beginning of the 2000s, bilateral aid has had a positive relationship with 'democracy' on average.

The individual analysis reveals great heterogeneity in the allocation pattern across donors. Other empirical studies on aid allocation with disaggregated analysis of individual donors such as Berthélemy and Tichit (2004), Younas (2008), Claessens et al. (2009), Isopi and Mavrotas (2009), Hoeffler and Outram (2011) show that the behavior of the average donor can vary considerably from the individual donor behavior. The available evidence suggests that, in most cases, there is no consistent allocation pattern across donors and no systematic difference between donor groups.

3. Empirical strategy

All variables used for the analyses are listed in Appendix C.1. In the following, the explanatory variables are presented.

3.1. Need

Under-five mortality, maternal mortality and HIV prevalence are included as main measures for poor health, in order to control to what extent the selection decision for health assistance is based on health indicators. *Under-five mortality rate* measures child survival and also reflects the socioeconomic and environmental conditions in which children live (WHO (2010): 112, 229). The improvement of maternal health is assessed by the *maternal mortality ratio* which monitors deaths related to pregnancy and childbirth. The indicator reflects the capacity of the health systems to provide effective health care to prevent and address the complications occurring during pregnancy and childbirth (WHO (2010): 119). *Prevalence of HIV* is a direct indicator of the burden related to HIV and reflects the prevalence of HIV among the population ages 15 till 49.[2,3]

3.2. Quality of the institutional environment

Several indicators are used to approximate the structural differences as regards the quality of the institutional environment in the receiving country. The variable *democracy* is measured on a unified polity scale ranging from -10 (strongly autocratic) to +10 (strongly democratic) (Marshall et al. (2010), 16) and is frequently used in analyses as proxy for the stability in the recipient country. The indicator *rights and liberties* is the non-weighted sum of the annual evaluation of the state of global freedom of individuals with respect to political rights like the electoral process and civil liberties like freedom of expression and belief; the variable was re-coded such that the scale ranges from 1 (least free) to 7 (most free) (Freedom House (2009)). *Economic freedom* measures the extent to which the policies and institutions of countries are supportive of economic freedom (Gwartney and Lawson

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[2] *Deaths due to HIV/AIDS* is the leading indicator to measure the burden of disease related to HIV/Aids, the impact of interventions and the success of program implementation (WHO (2010), 61). As this indicator is available for only a few years, we have substituted it by the above prevalence indicator which provides more comprehensive data.

[3] In all three cases, the reverse causation (high aid allocation for children's health, maternal health or adult health resulting in low mortality rates) should not pose a major problem due to the significant time lag between an aid intervention and a measurable change in health outcomes. In addition, all time-varying independent variables are lagged in the regressions.

(2009), xxi), on a 0 to 10 scale with 10 representing the greatest degree of freedom. The *Corruption Perceptions Index (CPI)* measures the perceived level of public-sector corruption; the variable has been re-coded such that it ranges from 1 (low corruption) to 10 (high corruption). The extent of rent-seeking activities is a proxy for a bad institutional environment in the receiving country.

3.3. Recipients' effort

Government health expenditures are measured by *public expenditure on health* in order to account for differences among recipients with respect to the financing of the national health system.[4] The coverage rate of immunizations is used as a proxy for the general attention that is being paid to public health issues in a recipient country. The *coverage of the third dose* of diphtheria toxoid, tetanus toxoid and pertussis vaccine is used as indicator for the quality of the health system for two reasons. First, the need to vaccinate children under the age of 7 against these three diseases is the same in developing and developed countries. Second, high coverage rates for the third dose of this common vaccine suggest a high health care quality.[5]

3.4. Competition

The findings of Chong and Gradstein (2008) suggest donors to be free-riders: a greater number of donors lowers the total amount of aid given by each country. However, Berthélemy (2006) finds that other donors' aid has a significantly positive impact on aid allocation. As the United States is an important donor in terms of their volume of health assistance, we suppose that its decisions could have a signaling effect for other donors.[6] The variable *US aid* controls for the volume of allocation decisions by the United States. Evidence from time series data suggests that bilateral aid can be a substitute for aid from multilateral organizations in some cases and a complement in others (Feeny and McGillivray (2008), 525). The variable *multilateral aid* controls for the aid activities of multilateral donors and serves as proxy for a possible bandwagon effect on bilateral aid. It measures the total sum of health assistance that a recipient received from multilateral donors in the previous year.

3.5. Bilateral relations

It has been argued that a donor may pursue economic interests in the receiving country as (potential) trading partner, either as market for its exports or as source of its imports. Long-term commercial relationships can make aid transfers to be of "mutual advantage" (Cassen (1994), 209). The proportion of a donor's *exports* to a given recipient represents the economic interest in the recipient country as

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[4] The caveat of using national health expenditures as proxy is that it allows gaining an impression of the quantitative efforts by the recipient government, but not the quality of the health system.

[5] This indicator is imperfect because it measures the outcome only and it is, hence, impossible to discern immunization campaigns initiated and financed by the international donor community from activities of the national government.

[6] We controlled for other donors' aid but found that there is little variation between the aggregate bilateral aid because the group of major donors drive these changes. Hence, we believe that focusing on the biggest donor United States allows drawing better conclusions on signaling effects.

potential market. High -level diplomatic representation between the countries reflects the political importance of the receiving country. The Index on Political Globalization accounts measures the intensity of political collaboration between countries on a scale of 1 (low) to 100 (high) and is used to approximate the *political integration* of a country on the international level (Dreher (2006)). In order to control for cultural links, the Index on Social Globalization is used as proxy for *social integration* of a country on the international level and is measured on a scale of 1 (low) to 100 (high) (Dreher (2006)). A common colonial past can create such a strong link that donor countries may even overlook or ignore potential problems, related to a high level of corruption, in their decision-making process (e.g. Alesina and Weder (2002): 1126-1127). The variable *own colony* captures the logged number of years since 1900 in which the country was an own colony. The distance between the donor's country and the recipient country has been argued to be important in the decision-making process (e.g. Neumayer (2003a), 654). Geodesic *distance* between donor's and recipient's capitals is used as proxy for salience and political importance.

3.6. Other controls

In addition, we measure need on a broader basis than the specific health indicators mentioned before, and employ logged *GDP per capita*. In the aid literature, per-capita income is the indicator of need commonly used to assess whether poor countries, as recipients in need of aid, are specifically targeted (e.g. Nunnenkamp and Thiele (2006), 1182). The variable logged *population* controls for the heterogeneous nature of recipients whose populations range from small (island) states to large nations. The population size of the recipient matters for two reasons. Finally, the variable *previous allocation* controls for possible path dependency and represents the aid allocation in the previous year.[7]

4. Estimation approach

4.1. Method

The standard Tobit model, the type II Tobit model and the two-part model are the estimation techniques for limited dependent variables most often used in aid allocation studies. The question whether there are significant differences between the determinants of country selection and the determinants of aid allocation as regards health assistance requires a technique that allows the separate modeling of the selection and the allocation decision. The standard Tobit model takes into account the censored nature of the aid variable but imposes a too restrictive structure: the decision-making process is modeled as a one-step process. It is inappropriate in our context because it excludes the possibility that a regressor increases the selection probability but decreases the volume of allocated aid or vice

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[7]   The selection decisions are probably not independent over the years. As a consequence, it would also be necessary to control for possible path dependency in the selection decision by including the lagged dependent variable. Since its inclusion as right-hand side variable results in issues with perfect collinearity, the investigation of possible path dependency is not possible at the selection stage.

versa. The second model, particularly the often employed Heckman's two-step procedure, allows separate and correlated mechanisms for the selection stage and the allocation stage, after conditioning on covariates. The drawback is to identify a variable that affects the selection but not the allocation in order to find a sensible exclusion restriction. The main weakness of the two-part model is the conditional independence assumption that the errors in both stages are uncorrelated. Consequently, it is assumed that the selection decision is taken independently from the allocation decision. If the conditional independence assumption is wrong, then the second part of the two-part model leads to biased estimates. The predictions are, however, nearly unbiased on average and hence negligible (Manning et al. (1987), 60). Cragg (1971) proposed the lognormal hurdle model as natural two-part extensions of the type I Tobit model; allowing "the determination of the size of the variable when it is not zero to depend on different parameters or variables from those determining the probability of its being zero." (Cragg (1971), 829). The first part of the lognormal hurdle model is estimated with probit using all observations and the second part is estimated via OLS with a logged dependent variable using the $y_i > 0$ observations.

4.2. Model

A lognormal hurdle model has been used to estimate the selection and the allocation decisions. In the first step, the estimation of the *selection* equation involves the estimation of a binary response model. The dependent variable is the probability that a donor provides positive amounts of aid, the visible evidence for the recipient's selection. The basic equation of the panel probit model takes the following form:

$$Pr[DAH_{ijt} = 1|x_{ijt}] = Pr[DAH_{ijt}^* > 0|x_{ijt}] = \text{F}(X) = \Phi[\alpha_i + \gamma_t + \beta X_{ij,t-1} + u_{ij,t-1}]$$

$$i = 1, \dots, 160; j = 1, \dots, 10; \ t = 1, \dots, 18.$$

where i refers to the recipient, j refers to the donor and t refers to time, the dependent variable DAH_{ijt} equals one if the latent variable DAH_{ijt}^* is greater than zero, and zero otherwise, Φ is the cumulative standard normal distribution function, α_i are recipient-random-effects, γ_t are time-fixed-effects, $X_{ij,t-1}$ is the vector of explanatory variables and $u_{ij,t-1}$ is the disturbance term.

In the second step, the *allocation* decision is estimated via *OLS* with a logged dependent variable using the $y_i > 0$ observations:

$$\ln(DAH_{ijt}) = [\alpha_i + \gamma_t + \beta X_{ij,t-1} + v_{ij,t-1}], DAH_{ijt} > 0$$

$$i = 1, \dots, 160; j = 1, \dots, 10; \ t = 1, \dots, 18.$$

where i refers to the recipient, j refers to the donor and t refers to time. The dependent variable $\ln(DAH_{ijt})$ represents the logarithm of development assistance for health from donor j to recipient i in

year t.[8] α_i are recipient-random-effects, γ_t are time-fixed-effects, $X_{ij,t-1}$ is the vector of explanatory variables and $v_{ij,t-1}$ is the disturbance term. [9]

The error terms are assumed to be each independent over i, but may be correlated over t for given i. All explanatory variables are lagged by one year to model the decision-making process adequately.[10] The recipient random effects control for unobserved country heterogeneity that is assumed to be independently distributed of the regressors. Time fixed effects control for changes over time that affect all recipients equally.

4.3. Data

The sample consists of balanced panel data with dyadic data on flows of development assistance for health from donor to recipient. The dataset comes from the Institute for Health Metrics and Evaluation, an independent global health research center at the University of Washington, located in Seattle, Washington.[11] The data is compiled based on the aid statistics on official development assistance for the health sector, provided by the Development Assistance Committee (DAC) of the Organization for Economic Co-operation and Development (OECD). The data covers a maximum of 160 recipient countries and dependent territories, and 10 donors between 1990 and 2007.[12] The database includes recipient countries that are classified as de facto dependent areas (see Appendix B). The donors included are Canada, Denmark, France, Germany, the Netherlands, Norway, Spain, Sweden, the United Kingdom, and the United States.[13]

DAH is defined as "financial and in-kind contributions made by channels of development assistance to improve health in developing countries. It includes all disease-specific contributions as well as general health sector support, and excludes support for allied sectors." (IHME (2009), 13). The definition does not explicitly exclude humanitarian aid, which is unfortunate because it presumably has a different purpose, since it is meant to alleviate immediate needs of all kinds, caused by disasters and emergencies. However, the inclusion does not necessarily constitute a problem for two reasons. First, the decision-making process of humanitarian aid is not influenced only by humanitarian need, but also bilateral, especially political, factors (Fink and Redaelli (2011)). Hence, humanitarian aid seems not to be systematically different but to follow similar rules as other foreign aid. Second,

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[8] We use constant 2007 dollars in order to adjust for inflation because aid given in 1990 corresponds to higher values in 2007 dollars. As all financial data are recorded in US dollars, there was no need to make currency conversions.

[9] In the trade literature, dyad fixed effects are increasingly used for analyzing dyadic trade flows; they control for distance, historical and cultural ties between states (e.g. Kerner (2009): 89).

[10] As decisions on aid allocation respectively the country selection are made prior to the actual disbursement of aid due to informational time lags, these variables are lagged in order to account for the type of information that was available to the decision-makers at that moment. The choice to lag the independent variables by one period is somewhat arbitrary. Other time lags have been used to test for robustness.

[11] The data has been publicly accessible since December 2009. A more recent version contains data for 2008, but only for a handful of recipient countries. When last checked, data for 2009 and 2010 was only based on estimations. Therefore, no more recent data has been included in this analysis.

[12] Since we focus here on donor-recipient aid flows, the regional respectively multi-country aid flows presented in the IHME database are ignored.

[13] Japan could not be included due to computational problems with the maximum likelihood estimation.

although not explicitly stated, it is very likely that the data exclude humanitarian aid, since the dataset is based on OECD data, which usually distinguishes between humanitarian and foreign aid.[14]

Appendix A.1 summarizes the selection and allocation decisions by major and like-minded donors. Out of 160 potential recipients, the donor selects between 55 and 143 receiving countries. Summing the choices from 1990 till 2007, the donors made between 517 choices, in the case of Denmark, and 1,354 choices in the case of the US. On average, a donor selects around about 37 recipients per year. The statistics on the individual allocation decision illustrate the heterogeneity of bilateral donors in terms of health assistance. The average of the allocated aid ranges from $1.1 million to $12 million. The US allocated the biggest aid shares, on average $12 million. The second largest allocations were made by the UK, on average almost $5 million. The other major donors allocated between $1.5 and almost $4 million. The like-minded donors provided between $1.1 and $2.2 million of health assistance on average. As indicated by the average amounts, the smallest minimum amount of health assistance allocated France with 16 cents. Spain provided the greatest minimum amount with almost $1,000. The smallest maximum allocation by a single donor was $21.2 million in the case of Norway. The US provided the largest maximum amount with $411 million.

Appendices A.2 and A.3 depict the selection and allocation decisions of major and like-minded donors, as the most important bilateral donors, per region and income group. The majority of all selected recipients are countries on the African continent for both major and like-minded donors. The second most often selected region is Asia, with the exception of Spain and Canada that give preference to recipients on the American continent. Denmark, Norway and Sweden did not select any country from Oceania as a potential recipient. Of the major donors, Germany and Spain did not select any upper-middle income country as recipient. Except Canada, no like-minded donor selected any upper-middle income country. On average, France allocated more health assistance to small islands in Oceania than to the African continent, which can be explained by the overseas dependent areas in Oceania, listed in Appendix B. Germany, the UK and Japan allocated, on average, more health assistance to Asia; the first to low and lower-middle income countries, the latter two more to upper-middle income countries. Spain allocated on average more health assistance to the American continents, while the US provided, on average, more health aid for African countries, but with a relatively large share to upper-middle income countries. Germany and Spain provided, on average, relatively large allocation shares to small islands. All like-minded donors allocated, on average, most aid to Africa, except Sweden that allocated most aid to Asia. All like-minded donors allocated, on

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[14] In an attempt to model the donors' decision-making process in the most accurate way possible, missing observations have been replaced by the last available observation of the variables Economic Freedom, Government Effectiveness, Corruption Perception Index and DTP3. A donor can only use available data in the decision-making process. For instance, in the selection decision in 1993, only data on economic freedom from 1990 could be used. This is a clear argument against extrapolation to fill missing observations. For some countries, the official data reported for the prevalence of HIV starts with missing values but reports a HIV prevalence of 0.1 percent in the following years. In these cases, the missing values were replaced by zeros.

average, large shares to small islands, with the exception of Canada. Canada, in turn, provides on average large allocations to upper-middle income countries.

5. Results

5.1. Interpretation

Table 1 provides the estimation results for the country selection and aid allocation decisions of major donors. The sample size between first stage and second stage varies because the allocation decision refers to a subsample of the selection decision. It is impossible to restrict the selection sample to the allocation sample because the first part is estimated via probit which needs both selected and unselected countries for the estimation method to work. Hence, the sample size of the allocation stage is smaller. Allocation decisions of all donors are positively correlated with decisions taken in the previous years and, thus, are path dependent.[15]

France provides more aid to smaller recipient countries. A 10% decrease in population size is associated with a 3% increase in health assistance. Population size and per capita income have no impact on the selection probability. The coefficient on maternal mortality in the first column suggests that countries with lower mortality rates are more likely to be selected by France. Surprisingly, none of the health indicators affects the allocation of health aid. As regards the institutional environment, on the one hand, recipients with less economic freedom seem to be more likely to be selected. On the other hand, a greater general level of freedom corresponds with more foreign assistance. Higher corruption has a significantly negative impact on health aid provision. The extent of democracy has no impact on the selection probability or aid amount by France. National health expenditures by the recipient increase the selection probability. However, expenditures and immunization rates are insignificant with respect to aid provision. In terms of competition among donors, it seems that multilateral aid crowds out French health assistance: A 10% increase in multilateral aid corresponds with 1.9% less aid. The bilateral relations between France and a recipient have a significantly positive impact. Economic links, political integration and a common colonial experience increase the selection probability and the provision of health aid. Commercial ties are the most important bilateral relations: A 10% increase in exports from France to the receiving country is associated with a 4.5% increase in health assistance.

Recipient countries with greater populations are more likely to be selected by *Germany*. Yet, per capita income and population size are insignificant for the German allocation decision. Under-five mortality increases the selection probability but decreases the amount of aid provided. However, in both cases the magnitude is only marginal. Maternal mortality seems to affect the selection probability

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[15] To include the dependent variable as lagged independent variable makes sense from an econometric point of view, but is likely to lower the relative importance of the standard control variables and other independent variables considerably. The dilemma is that, on the one hand, the explanatory power of the overall model increases considerably but that, on the other hand, the factors driving the allocation decision are not better discriminated through the inclusion of the lagged dependent variable as independent variable.

negatively but has a significantly positive effect on the allocation decision: A one unit increase in maternal mortality is associated with a 4% increase in health assistance. The prevalence of HIV has no significant impact on either decision. The coefficients on proxies for the institutional environment and on proxies for the recipients' effort suggest that they do not affect the selection or the allocation. The German decision-making process is also unaffected by allocation decisions of the United States or multilateral donors. Bilateral relations have no impact on the selection probability but the common colonial past increases the provision of health assistance.

Per capita income, population size and poor health indicators have no impact on the selection probability or the aid provision by *Spain*. Economic freedom increases the selection probability but does not affect the allocation decision. Democratic and freer recipients receive significantly more Spanish health assistance. The corruption level has no impact on either decision. National health expenditures have a significantly negative impact on aid allocation: A one unit increase is associated with 45% less health assistance. The Spanish decision-making process is unaffected by multilateral or US American allocation of health aid. Economic links between Spain and recipient increase the selection probability but are insignificant for the allocation decisions. The coefficient on political integration suggests that less politically integrated recipients receive more health assistance. The distance or the social integration of the recipient is insignificant for either decision.

The *United Kingdom* is more likely to select, and allocates more health aid to poorer and larger recipient countries. A 10% decrease in per capita income is associated with a 7.2% increase in aid and a 10% greater population receives 5.2% more aid on average. The coefficient on HIV prevalence suggests that recipients with high HIV prevalence are more likely to be selected. In addition, they receive more health assistance: A 10% higher prevalence rate corresponds with 0.7% more health aid on average by the United Kingdom. The other health indicators are insignificant for the selection and allocation decision. The results suggest that democratic and more corrupt countries are more likely to be selected. The economic freedom and general freedom have no impact on the selection probability. The proxies for institutional quality do not affect the allocation decision by the UK. The immunization rate in the recipient country seems to decrease the selection probability. However, the magnitude of the effect is only marginal. Health expenditures for the national health system do not affect the selection or allocation decision by the UK. Equally, multilateral and US allocation of health assistance has no impact on aid allocation by the UK. Bilateral relations affect the selection probability. The coefficient on political integration suggests that less integrated recipients have greater chances to be selected. Yet, the economic significance is only marginal. The common colonial past has a positive impact on the selection decision. Contrary to expectations, bilateral relations do not influence the allocation decisions.

The *United States* is more likely to select poor and large recipient countries. Per capita income also influences aid allocation: A 10% decrease in income corresponds with a 3.4% increase in health assistance. The population size has no impact on the allocation decision. HIV prevalence has a

significantly positive effect on the selection portability and the aid provision: A 10% higher prevalence rate corresponds with 0.4% more health assistance. Maternal mortality and under-five mortality do not affect selection or allocation decisions by the US. The economic freedom of a recipient country seems to increase the selection probability, however, it is insignificant for the allocation decision. Generally speaking, proxies for institutional factors do not affect the US health assistance. Health expenditures and immunization rates are insignificant for the selection and allocation decision. Multilateral health provision does not affect the aid allocation by the US. Bilateral relations have a significant impact on the decision-making process. Less politically integrated recipients are marginally more likely to be selected. Geographically close recipients have a greater selection probability. Nevertheless, economic links between the US and receiving countries are the decisive factor for the allocation decision: 10% higher exports correspond with almost 2% more health assistance.[16]

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[16] In the case of Spain and the United States, we tested in addition for the influence of a colonial relationship between other donors and recipients. Contrary to our expectations, we did not find any evidence that these recipient countries are less likely to be selected. – The variable *other colony* measures the logged number of years since 1900 in which the country was the colony of another donor.

Table 1. Estimation results: Selection and allocation decisions of major donors

	Major donors									
	France		Germany		Spain		UK		USA	
	I	II	I	II	I	II	I	II	I	II
Control variables										
(ln) GDPpc	0.0343	-0.2982	-0.0056	-0.1118	-0.0961	0.2016	-0.1102	-0.7161	-0.1213	-0.3353
	(0.47)	(-1.12)	(-0.08)	(-0.77)	(-1.62)	(0.58)	(-2.00)**	(-2.38)**	(-2.37)**	(-3.07)***
(ln) Population	-0.0285	-0.2922	0.0975	0.1684	0.0671	-0.1173	0.1731	0.5231	0.0675	-0.1069
	(-0.74)	(-2.14)**	(1.65)*	(1.25)	(1.45)	(-0.40)	(2.88)***	(2.59)***	(1.73)*	(-1.04)
Health indicators										
Under-five mortality	0.0015	-0.0039	0.0059	-0.0053	0.0008	0.0020	-0.0006	-0.0029	0.0004	0.0008
	(0.89)	(-0.67)	(2.07)**	(-2.01)**	(0.52)	(0.29)	(-0.42)	(-0.69)	(0.28)	(0.27)
Maternal mortality	-0.0332	-0.0715	-0.0456	0.0398	0.0157	-0.0760	-0.0067	-0.0285	-0.0160	-0.0317
	(-1.78)*	(-1.09)	(-2.05)**	(1.96)*	(0.90)	(-1.27)	(-0.40)	(-0.57)	(-1.05)	(-0.86)
HIV prevalence	0.0093	0.0435	0.0042	0.0121	0.0072	0.0700	0.0174	0.0668	0.0222	0.0360
	(1.39)	(1.09)	(0.69)	(0.88)	(1.07)	(1.38)	(2.44)**	(2.17)**	(3.07)***	(2.71)***
Environment										
Democracy	-0.0084	-0.0164	0.0007	-0.0017	0.0011	0.0983	0.0066	0.0412	0.0022	0.0093
	(-1.56)	(-0.67)	(0.17)	(-0.16)	(0.19)	(2.13)**	(1.65)*	(1.27)	(0.55)	(0.74)
Economic freedom	-0.0895	-0.1610	0.0292	0.0170	0.0798	-0.1441	-0.0176	-0.1392	0.0528	0.0384
	(-1.92)*	(-1.37)	(0.56)	(0.19)	(1.97)**	(-0.40)	(-0.51)	(-1.32)	(1.82)*	(0.38)
Rights and liberties	-0.0112	0.1731	-0.0088	-0.0656	-0.0125	0.2244	-0.0048	0.0623	-0.0027	0.0136
	(-0.73)	(1.83)*	(-0.67)	(-1.55)	(-0.83)	(1.78)*	(-0.42)	(0.80)	(-0.39)	(0.30)
Corruption	0.0225	-0.1158	0.0014	0.0076	-0.0063	-0.0316	0.0188	0.0389	0.0044	-0.0480
	(1.25)	(-1.93)*	(0.15)	(0.26)	(-0.56)	(-0.33)	(2.21)**	(0.72)	(0.73)	(-1.23)
Effort										
Health expenditures	0.0829	-0.1215	-0.0004	-0.0771	0.0245	-0.4457	-0.0384	-0.0215	-0.0403	-0.1179
	(1.85)*	(-0.48)	(-0.01)	(-0.95)	(0.69)	(-2.16)**	(-1.32)	(-0.16)	(-1.61)	(-1.14)
Immunization	0.0012	0.0096	0.0008	-0.0004	-0.0026	0.0168	-0.0047	-0.0075	-0.0005	-0.0021
	(0.51)	(0.85)	(0.35)	(-0.09)	(-1.20)	(1.46)	(-2.37)**	(-1.06)	(-0.38)	(-0.55)
Competition										
(ln) US aid	-	-0.0070	-	-0.0311	-	-0.0652	-	0.1669	-	-
		(-0.09)		(-0.79)		(-1.05)		(1.23)		
(ln) Multilateral aid	-	-0.1869	-	0.0403	-	0.2927	-	-0.0265	-	0.0335
		(-1.73)*		(0.84)		(0.98)		(-0.41)		(0.78)
Bilateral relations										
(ln) Exports	0.0615	0.4550	-0.0274	0.0219	0.0476	0.1363	-0.0372	0.0410	0.0195	0.1803
	(1.96)**	(2.13)**	(-0.47)	(0.29)	(1.88)*	(0.63)	(-1.44)	(0.26)	(0.71)	(2.34)**
Political integration	0.0083	0.0180	-0.0014	0.0001	0.0015	-0.0379	-0.0047	-0.0189	-0.0049	-0.0047
	(2.40)**	(1.68)*	(-0.61)	(0.02)	(0.51)	(-1.79)*	(-1.65)*	(-1.56)	(-2.54)**	(-0.98)
Social integration	-0.0055	-0.0315	-0.0030	-0.0121	-0.0002	-0.0021	0.0012	0.0226	0.0015	-0.0012
	(-1.26)	(-1.00)	(-0.69)	(-1.20)	(-0.04)	(-0.06)	(0.21)	(1.07)	(0.53)	(-0.12)
(ln) Own colony	0.1052	0.1999	0.0632	0.1250	-	-	0.0541	0.1168	-	-
	(2.52)**	(2.39)**	(1.00)	(2.00)**			(1.74)*	(1.36)		
(ln) Distance	-0.1261	0.3517	0.0513	-0.0660	-0.1149	-0.7188	0.0015	-0.1146	-0.1882	0.2639
	(-1.13)	(0.75)	(0.53)	(-0.34)	(-1.36)	(-1.47)	(0.01)	(-0.27)	(-2.44)**	(1.43)
(ln) Aid	-	0.6204	-	0.6460	-	0.4680	-	0.4095	-	0.8300
		(4.88)***		(6.41)***		(4.21)***		(3.89)***		(16.58)***
Observations	300	149	300	194	299	128	300	138	478	337
No. of groups	49	32	49	40	49	30	49	27	68	59
log likelihood	-77.7875	-	-35.7786	-	-80.4737	-	-64.2079	-	-116.2480	-
R-squared overall model	-	0.7836	-	0.7197	-	0.4206	-	0.7763	-	0.7965

(I) Dependent variable is selection probability (1 = receives aid; 0 = does not receive aid). Estimates are based on probit maximum likelihood procedure, Gauss-Hermite adaptive quadrature with 24 quadrature points. t-statistics are reported below the marginal coefficient estimates. (II) Dependent variable is logged aid. OLS estimates of lognormal hurdle model. t-statistics are reported below the coefficient estimates. - Robust standard errors. All equations include year-specific time dummies. Coefficient of constant not reported. All time-varying regressors are lagged by one year. ***, **, * denote significance at 1, 5, and 10 percent, respectively. The sample varies between selection stage respectively the allocation stage of donors due to data availability for some variables. The sample for the allocation decision is smaller by definition: While the selection decision included selected and non-selected recipients, the allocation decision includes only the subsample of selected recipients.

Table 2 reports the estimation results for the decision-making process of like-minded donors. The allocation decisions of all like-minded donors also depend on the allocation process of the previous year.

Canada is more likely to select poor recipient countries. Yet, per capita income and population size have no impact on the provision of health assistance. The coefficient on HIV prevalence suggests that high prevalence rates correspond with greater selection probability. The other health indicators do not affect the selection process.[19] Interestingly, none of the three health indicators has a significant effect on the allocation of health aid. The corruption level of a recipient has a positive impact on the selection process but a negative effect on the provision of health assistance. A one unit higher corruption level is associated with a 10% decrease in aid allocation. The other institutional factors are insignificant for selection and allocation decision. Health expenditures and immunization rates have no effect on the decision-making process. Multilateral aid allocation is complemented by Canadian health assistance: 10% higher multilateral aid is associated with 1.6% more health aid. Bilateral relations affect the selection probability by Canada but do not influence the allocation decisions with respect to health assistance. Economic and political links have a significantly positive influence on the selection process. Close recipient countries are more likely to be selected.

Denmark allocates more health assistance to poorer recipient countries. 10% lower per capita income is associated with 10% more health aid. The population size is irrelevant for the allocation decision. Income and population have no significant effect on the selection process. The maternal mortality has a significantly negative impact on selection and allocation: A 10% lower mortality rate corresponds with almost 20% more health assistance.[20] The coefficient of HIV prevalence suggests that high prevalence increases the selection probability. However, it does not affect the allocation decision. Democratic, freer and less corrupt recipients are more likely to be selected by Denmark. In terms of aid allocation, the level of economic freedom has a significantly positive impact on health assistance: One unit more economic freedom corresponds with 65% higher aid. National health expenditures by the recipient decrease the selection chances. Yet, neither health expenditures nor immunization significantly affect the allocation process. US aid allocation has a significantly positive effect on Danish health assistance: A 10% increase is associated with 2.3% more Danish aid. Bilateral relations between donor and recipient do not affect the decision-making process.

The *Netherlands* is more likely to select and provide more health assistance to poorer recipients: 10% less per capita income of the recipient country corresponds with almost 12% higher aid provision. The Netherlands also allocated more aid to smaller countries: A recipient with 10% less population receives 7% more health assistance on average. Lower maternal mortality and higher HIV prevalence

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[19] Estimated separately, also maternal mortality has a significant positive impact on the selection probability, with the coefficients of the other variables largely remaining the same.

[20] When the health estimators are separately controlled for, maternal mortality does neither have a significant impact on the selection decision nor on the allocation decision.

increase the selection probability.[21] Yet, none of the health indicators has a significant effect on the allocation of health assistance. A democratic country is more likely to be selected by the Netherlands. However, neither democracy nor freedom nor corruption is significant for the allocation decision. Health expenditures by the recipient decrease the selection probability but do not significantly affect the allocation of health aid. Immunization rates are insignificant for the selection decision but have a significantly positive effect on aid provision: A 10% higher immunization rate is associated with 0.5% more health assistance. The allocation decisions of multilateral donors or the United States have no impact on the Dutch allocation process. Bilateral relations are insignificant for the selection decision but affect the allocation decision positively: 10% more exports to the recipient correspond with 3.8% more health aid. A one unit increase on the political integration means 3.3% more assistance on average. The Dutch allocation decisions are geographically biased because a 1% greater distance is associated with 2.2% more health aid provision.

Norway is more likely to select poorer and larger recipients. Per capita income and population size have no effect on the allocation decision. HIV prevalence has a significantly positive effect on the selection probability. Surprisingly, none of the health indicators affects the allocation decision.[22] Economic freedom and corruption increase the selection probability significantly. However, the proxies for the institutional environment of the recipient have no significant impact on the allocation decision for health assistance. The coefficient of immunization rate suggests that one unit increase in immunization coverage corresponds with 1.4% more health assistance. Hence, the recipients' efforts are complemented with higher aid allocations on average. The allocation decisions of multilateral donors and the United States have no effect on the Norwegian decision-making process. While bilateral relations are insignificant for the selection probability, the coefficient on political integration suggests that politically less integrated recipients receive 1% more health aid on average.

Recipient countries with greater populations are more likely to be selected by *Sweden*. The per capita income and population size have no effect on the allocation decision. Higher under-five mortality, lower maternal mortality and higher HIV prevalence increase the selection probability.[23] However, the health indicators are insignificant for the allocation of health assistance.[24] Institutional aspects have no impact on the selection decision. However, it seems that less democratic and economically freer countries receive more health aid: A one unit less democratic country receives 7.3% more assistance; a one unit increase in economic freedom means 43% more aid. The corruption level has no significant effect on the allocation decision. Higher immunization rates seem to increase the selection probability. However, neither a recipient's health expenditures nor the immunization

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[21] Again, the coefficient of maternal mortality becomes insignificant, when estimated in isolation, while the coefficients of the other variables are not affected.

[22] In separate estimations, however, maternal mortality, as only health indicator, has a significantly positive impact on the allocation decision. A 1% increase in maternal mortality is associated with 6.6% more health assistance.

[23] Under-five mortality and HIV prevalence continue to have a significantly positive effect on the selection decision, when estimated separately.

[24] Estimated in isolation, maternal mortality has a significant positive impact on the allocation decision, with the coefficients of the other variables being unaffected. A 1% increase in maternal mortality is associated with 15.6% more health assistance.

coverage influence the allocation process of health aid significantly. Multilateral health aid appears to crowd out Swedish health assistance: 10% more multilateral aid is associated with roughly 2% less Swedish aid. Bilateral relations between Sweden and the recipient country have no significant effect for the Swedish decision-making process.

Table 2. Estimation results: Selection and allocation decisions of like-minded donors

	Canada I	Canada II	Denmark I	Denmark II	Netherlands I	Netherlands II	Norway I	Norway II	Sweden I	Sweden II
Control variables										
(ln) GDPpc	-0.3227	-0.1215	-0.1443	-1.0144	-0.1152	-1.1647	-0.1120	-0.2184	-0.0311	-0.2005
	(-4.38)***	(-0.46)	(-1.46)	(-3.20)***	(-1.65)*	(-2.06)**	(-1.67)*	(-0.87)	(-0.56)	(-1.11)
(ln) Population	0.0511	-0.0819	0.0746	0.1790	0.0519	-0.7139	0.1217	0.1306	0.0685	0.2434
	(1.03)	(-0.44)	(0.84)	(0.50)	(0.97)	(-2.00)**	(2.37)**	(0.81)	(2.00)**	(1.51)
Health indicators										
Under-five mortality	-0.0014	0.0038	0.0017	0.0138	0.0014	0.0054	-0.0001	-0.0008	0.0021	0.0039
	(-0.84)	(0.70)	(0.66)	(1.53)	(0.73)	(0.55)	(-0.11)	(-0.26)	(2.00)**	(0.84)
Maternal mortality	0.0059	0.0061	-0.0583	-0.1879	-0.0541	-0.0949	-0.0271	0.0551	-0.0249	0.1057
	(0.28)	(0.10)	(-1.86)*	(-2.06)**	(-1.90)*	(-0.86)	(-1.53)	(1.63)	(-1.93)*	(1.42)
HIV prevalence	0.0367	0.0316	0.0404	0.0332	0.0519	-0.0330	0.0552	0.0230	0.0417	0.0160
	(3.68)***	(0.97)	(3.00)***	(0.69)	(2.87)***	(-1.08)	(2.55)**	(1.00)	(3.08)***	(0.77)
Environment										
Democracy	0.0097	-0.0377	0.0151	0.0309	0.0138	-0.0317	0.0052	-0.0090	0.0009	-0.0734
	(1.53)	(-1.28)	(1.74)*	(0.79)	(2.45)**	(-0.58)	(0.99)	(-0.66)	(0.23)	(-2.88)***
Economic freedom	0.0483	0.0721	0.0904	0.6528	-0.0610	0.2820	0.0975	0.1313	0.0559	0.4310
	(1.01)	(0.42)	(1.31)	(1.80)*	(-1.30)	(1.11)	(1.74)*	(1.14)	(1.38)	(2.83)***
Rights and liberties	-0.0188	-0.0118	0.0496	0.0311	-0.0074	-0.0428	0.0252	0.0050	0.0122	-0.0390
	(-1.42)	(-0.15)	(2.08)**	(0.26)	(-0.61)	(-0.39)	(1.60)	(0.12)	(1.13)	(-0.68)
Corruption	0.0215	-0.0964	-0.0518	-0.2092	-0.0038	0.0770	0.0441	-0.0093	-0.0103	0.0605
	(1.72)*	(-2.06)**	(-2.15)**	(-0.78)	(-0.35)	(0.49)	(2.35)**	(-0.29)	(-0.95)	(0.75)
Effort										
Health expenditures	0.0295	0.1190	-0.1302	0.4063	-0.1559	0.2798	-0.0049	-0.0470	-0.0087	0.0092
	(0.81)	(1.09)	(-2.37)**	(1.04)	(-2.40)**	(1.05)	(-0.12)	(-0.41)	(-0.29)	(0.07)
Immunization	-0.0022	-0.0009	0.0017	0.0197	-0.0020	0.0474	-0.0006	0.0143	0.0048	0.0060
	(-0.98)	(-0.10)	(0.56)	(0.85)	(-0.85)	(2.66)***	(-0.34)	(1.66)*	(2.39)**	(0.57)
Competition										
(ln) US aid	-	0.0840	-	0.2322	-	0.1745	-	0.0438	-	0.1126
		(1.08)		(2.17)**		(1.23)		(1.02)		(1.56)
(ln) Multilateral aid	-	0.1611	-	-0.2465	-	-0.0642	-	-0.0715	-	-0.1994
		(1.82)*		(-1.02)		(-0.31)		(-1.09)		(-1.98)**
Bilateral relations										
(ln) Exports	0.0656	0.0355	0.0238	0.0782	0.0148	0.3757	-0.0107	0.0335	0.0176	-0.0337
	(1.89)*	(0.24)	(0.42)	(0.42)	(0.34)	(1.70)*	(-0.60)	(0.34)	(0.81)	(-0.38)
Political integration	0.0052	0.0086	-0.0053	-0.0128	0.0033	0.0329	-0.0043	-0.0105	-0.0033	0.0098
	(2.02)**	(0.64)	(-1.24)	(-0.75)	(1.07)	(1.68)*	(-1.33)	(-1.68)*	(-1.58)	(0.97)
Social integration	0.0039	-0.0125	-0.0016	0.0364	0.0047	-0.0273	-0.0100	-0.0007	-0.0009	-0.0002
	(0.75)	(-0.65)	(-0.20)	(0.59)	(0.90)	(-0.70)	(-1.39)	(-0.05)	(-0.24)	(-0.01)
(ln) Own colony	-	-	-	-	0.0133	-0.1424	-	-	-	-
					(0.18)	(-0.83)				
(ln) Distance	-0.3301	-0.4295	0.2547	-0.8617	0.0459	2.1946	-0.0375	-0.3724	-0.0280	0.0156
	(-2.96)***	(-1.09)	(0.96)	(-1.20)	(0.33)	(2.27)**	(-0.31)	(-0.78)	(-0.33)	(0.02)
(ln) Aid	-	0.5393	-	0.4528	-	0.3934	-	0.7284	-	0.6680
		(6.42)***		(4.30)***		(2.57)**		(6.52)***		(9.86)***
Observations	478	184	290	89	300	107	289	155	290	103
No. of groups	68	43	46	21	49	24	46	30	46	33
log likelihood	-178.5490	-	-81.1701	-	-103.4407	-	-58.2759	-	-53.7874	-
R-squared overall model	-	0.6026	-	0.6834	-	0.7060	-	0.7266	-	0.8871

(I) Dependent variable is selection probability (1 = receives aid; 0 = does not receive aid). Estimates are based on probit maximum likelihood procedure, Gauss-Hermite adaptive quadrature with 24 quadrature points. t-statistics are reported below the marginal coefficient estimates. (II) Dependent variable is logged aid. OLS estimates of lognormal hurdle model. t-statistics are reported below the coefficient estimates. - Robust standard errors. All equations include year-specific time dummies. Coefficient of constant not reported. All time-varying regressors are lagged by one year. ***, **, * denote significance at 1, 5, and 10 percent, respectively. The sample varies between selection stage respectively the allocation stage of donors due to data availability for some variables. The sample for the allocation decision is smaller by definition: While the selection decision included selected and non-selected recipients, the allocation decision includes only the subsample of selected recipients.

5.2. Sensitivity analysis

The results are robust to several sensitivity checks. A longer time lag of two years affects some coefficients but does not change the general results of the selection decision. Also most of the results on bilateral aid allocation behavior are robust to a change in the time lag. The estimation results of France and Denmark are most affected. The results for health indicators suggest a stronger and more consistent orientation at poor health indicators than the initial results. However, the French, Spanish, Dutch and Swedish allocation decisions for health assistance are not affected by the poor health indicators of the recipient country. The results of the robustness check hence imply that some donors do not consider the health situation in the recipient country when allocating health assistance.

The second robustness test replaced per capita income with the Human Development Index (HDI). When controlling for the general level of development, the results remain largely the same. While the estimation results of the other coefficients of the allocation decision remain largely the same, the results for the HDI are different from the results for per capita income. Spain, Norway and Sweden allocate up to 7% more health assistance to less developed recipients. When the development level is controlled for, Norway and Sweden allocated more aid to more populous countries but France no longer favors small recipient countries. In general, the estimation results for Norway are most affected. Maternal mortality increases the health assistance by Norway, while under-five mortality slightly decreases it. Similar to the previous results for Sweden, Norway provides more health aid to less democratic but more economically free countries (with the latter effect being ten times greater). Allocations by multilateral donors reduce Norwegian health assistance. All other coefficient estimates for the remaining donors remain largely unaffected.

We dropped transition countries from our sample in order to test for possible outliers. The results remain largely unaffected. The estimation results for the allocation decision are not affected by possible outliers such as transition countries. However, the sample of the robustness test is very similar to the original sample. In fact, only the estimations for France, Germany, the US and Sweden could be tested for robustness because the number of observations remained the same for the other donors.

5.3. Discussion

The analysis of the decision-making process of major and like-minded donors reveals the great heterogeneity among donors as well as the differences between selection and allocation stage. The main concern of this study is to analyze the importance of health indicators for decisions related to health assistance. The evidence shows that all major donors, except Spain, base their decision-making process on health indicators, but heterogeneously. Under five-mortality seems only relevant for the decisions taken by Germany, but with opposing signs: While a higher under-five mortality rate increases the chances of selection, it reduces the allocation of funds. Maternal mortality affects the decisions of France and Germany. Both donors seem to select a country with a higher mortality rate

less likely. Nevertheless, Germany allocates more health aid to such recipients. The evidence for the UK and the US reveals the prevalence of HIV in a recipient country as a determinant because recipients with greater prevalence of the disease experience a higher selection probability and greater allocations. As far as the latter donor is concerned, this result is in line with the prominent role that the US plays as major financier of the HIV/Aids campaigns through the PEPFAR initiative. [25] Health indicators are important factors for the selection decisions by all like-minded donors. Only Denmark, however, takes such aspects into account when allocating health assistance. Under-five mortality affects only the Swedish selection decision, but with marginal economic significance. A recipient with a higher maternal mortality rate is less likely to be selected by the Netherlands, Sweden and Denmark. The latter also allocates less health assistance to such recipient countries. The prevalence of HIV increases the selection probability by all like-minded donors, but does not have any significant effect on the allocation decisions of any donor.

In summary, the prevalence rate of HIV is the health indicator that seems to affect most selection decisions but only few allocation decisions. This means that, high HIV prevalence increases the selection chances but not necessarily the actual aid allocation. In comparison, under-five mortality and maternal mortality are less important for the decision-making process.[26] The results show that the health indicators matter, first, differently for the different donors and, second, differently at the two decision stages.

Per capita income, as standard measure for poverty, affects the selection decision of each second bilateral donor but the allocation decision of only four out of ten. Different from other variables, per capita income has a consistently negative effect when it is significant. This means that poor countries are not only more likely to be selected but also receive greater shares of health assistance. Regarding the different groups of bilateral donors, there is no evidence that like-minded donors allocate their health assistance systematically to poorer countries, which refutes the myth that they are more poverty concerned.

The quality of the institutional environment influences eight out of ten selection decisions and five out of ten allocation decisions. Germany is the only donor for whose decision-making process institutional factors are irrelevant. When these factors matter, democratic countries, recipients with economic freedom, and countries with general freedom are more likely to be selected or receive higher aid allocations. In all cases, the effect is statistically significant for either the selection decision or the allocation decision; never for both stages. The effect of corruption in the recipient country on the

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[25] PEPFAR is The United States President's Emergency Plan for AIDS Relief. The initiative provided funds worth more than $25.5 billion between 2004 and 2009 (PEPFAR (2012)).

[26] Our estimation results show that health indicators are not as important for the selection respectively the allocation decisions of major and like-minded donors as initially expected. One possible explanation is provided by the large confidence limits of health indicators, which probably motivate the use of alternative figures of neediness. Yet, per capita income, as a broader measure of recipient need, does not consistently affect the decision-making process either. In addition, the estimation results do not indicate any pattern in which per capita income systematically substitutes health indicators. On the other hand, a strong argument against the use of alternative indicators to assess recipient need is the underestimation of health figures due to underreported cases. Therefore, national averages serve as rule of thumb in order to get a sense for the health circumstances of particularly poor people, as these figures mark the lower bottom and the actual situation is in all likelihood worse.

donor behavior is less consistent. One third of the donors selects less corrupt countries more likely. The level of corruption affects the allocation decision of only two out of ten donors which allocate less health assistance to corrupt recipients. Although the quality of the institutional environment significantly influences the decision-making process of most donors, first, no pattern for the individual donor is visible and, second, no evidence for a systematic difference between major and like-minded donors is found.

The national expenditures for public health by the recipient have no systematic effect on the bilateral decision-making. One donor rewards high health expenditures with a greater selection probability, while two donors select such recipients less likely. The health expenditures affect the allocation decision of only one donor, which allocates less health assistance. In other words, the national expenditures for public health are irrelevant for the decision-making process of the great majority of bilateral donors. High immunization coverage triggers attention visible in a greater selection probability in only one case. Yet, high coverage has the opposite effect for another donor. In two cases, high immunization rates increase the allocation of health assistance. This means that the coverage rate is irrelevant for the decision-making process of most bilateral donors. In any case, a higher selection probability translates into greater provision of health assistance and vice versa. The two indicators might not be adequate proxies to measure recipient's effort. One, health expenditures can be interpreted as indicator for the capacity of the national government, which means a different measure for recipient need and no longer a measure for recipient merit. Two, immunization coverage does not allow for discriminating efforts of the national government from contributions of the international donor community.

The allocation pattern of US health assistance, respectively multilateral aid, is irrelevant for the allocation decision of almost all donors. For only one out of ten donors, the bilateral donor allocates more health aid to recipients which also received US health assistance. One out of ten donors complements multilateral aid with own health assistance to these countries, while two out of ten allocate less health assistance to recipients which also received multilateral aid.

The several types of relationships between donor and recipient have very different effects on the selection and the allocation decision. Economic links increase the selection probability as well as the allocated health assistance in thirty percent of the decisions. Political ties increase the selection probability in two out of ten cases but decrease the selection probability in as many, while they increase the allocated health assistance in two cases but decrease it in as many. Social integration is insignificant for the decision-making process. Historic links increase the selection probability respectively the allocation in two cases. Geographic proximity increases the selection probability in two cases but decreases the allocation in one case. The pattern for France is an exception because it is the only donor for which higher selection probability translates into higher aid allocation for the respective bilateral link. Denmark and Sweden are exceptional because bilateral relations are insignificant for both their selection and their allocation decision. In general, bilateral relations have a

greater effect on the decision-making process of major donors than on like-minded donors. Overall, the relationship between donor and recipient has a surprisingly strong impact on the decision-making process for health assistance of bilateral donors.

Our results cannot be compared directly to the results of previous research on aid allocation, because this study focuses on sector-specific aid, includes observations for a longer time period than many other studies, and analyzes more aspects than most others. With that being said, the preference for poor countries is in accordance with the existing literature. The often found population bias towards more populous countries cannot be consistently confirmed. The result that HIV/Aids is the decisive health indicator, at least for the selection decisions, is partly in line with previous findings that the fight against HIV/Aids shapes the allocation of aid (Thiele et al. (2007), 622). Our analysis provides additional evidence that the institutional environment matters for the decision-making process, but with large differences between major donors, confirming previous findings of Svensson (1999) and Alesina and Dollar (2000). The results also reveal that like-minded donors do not behave systematically different in this respect, which is in line with Neumayer (2003a). The mostly positive effect of democracy on the selection respectively the allocation decision confirm the general findings of Neumayer (2003b) but the donor countries are mostly different ones. In the same article, the UK and Canada are found to select a recipient with low corruption more likely, while our analysis shows the opposite effect for these two countries. Similar to his findings that the corruption level has basically no effect on allocation of foreign aid, corruption lowers the allocated development assistance in few cases in our study. Previous analyses found the behavior of other donors including multilateral donors to be a relevant factor for donor decisions (e.g. Berthélemy (2006), Younas (2008)) but to a varying degree (e.g. Hoeffler and Outram (2011)). However, as far as health assistance is concerned, these findings cannot be confirmed. The importance of bilateral relations for health assistance is in accordance with the literature on allocation of foreign aid. These similarities in the results suggest that the findings on the selection and allocation choices of bilateral donors are valid and not caused by the model specification.

6. Conclusion

In this paper we examine the impact of health indicators on the selection and allocation decisions with respect to development assistance for health of 10 donors for 160 recipients for the period 1990–2007. As three health objectives are part of the Millennium Development Goals, they are expected to play a crucial role when donors select prospective recipients respectively allocate funds to these countries. Hence, the principal question of the analysis is to what extent recipient countries with poor health indicators are targeted particularly for health assistance.

Health indicators are important determinants of the selection and allocation process for health assistance but HIV prevalence is the proxy with the strongest effect. The three health objectives,

although defined as equally important in the MDGs, do not equally influence the bilateral decision-making process. In summary, the prevalence rate of HIV seems to be the health indicator that affects most selection decisions. However, when it comes to the determinants of the allocation, only two donor countries take this aspect into account. When HIV prevalence is significant, it has a positive effect on the respective decision. Maternal mortality and under-five mortality, however, affect the selection or allocation decision positively or negatively.

In addition to the health indicators, we have also analyzed the importance of other covariates. The quality of the institutional environment is important for the allocation decision by many bilateral donors. Yet, the indicators of institutional quality affect the decision-making process without any visible pattern. Expenditures for public health have no systematic effect on the bilateral decision-making process. Strategic interactions have no effect on the allocation decision of most individual donors. Many donors are strongly influenced in their decision-making process by relational ties between donor and recipient.

In summary, few donors consider indicators on the health situation in the recipient country when they allocate health assistance. In fact, the quality of the institutional environment and the bilateral relations seem to be very important aspects for most donors. The findings also underscore the great heterogeneity among donors. Different from other studies on aggregate foreign aid, we do not find any evidence for like-minded donors being more health or poverty concerned than major donors. In addition, the evidence highlights the differences between the selection and the allocation stage. Only a distinction between the selection and the allocation decisions allows for a detailed understanding of the driving factors at each stage. As seen in this study, the same independent variable can vary in significance, sign and magnitude between the two stages. Thus, econometric techniques that assume the variables to have the same effects for the two decisions, at best, omit part of the story and, at worst, cause biased results.

Appendix A

A.1 Aggregate selection and allocation decisions of donors in the sample, 1990-2007

Donor	Selection		Allocation				
	No. of recipients	Total no. selections	Mean	Median	Minimum	Maximum	Standard deviation
Major donors							
France	123	1,258	1,428,123	394,559	0.16	45,900,000	3,390,448
Germany	105	859	2,636,010	949,409	790.74	56,500,000	5,252,742
Japan[a]	143	1,058	3,680,954	1,248,256	202.27	91,900,000	6,699,620
Spain	94	645	2,343,768	733,470	958.25	41,800,000	4,542,145
UK	93	930	4,725,192	506,804	29.62	217,000,000	12,700,000
US	114	1,354	12,000,000	5,233,545	42.80	411,000,000	23,800,000
Like-minded donors							
Canada	104	677	1,195,258	389,848	217.52	27,500,000	2,735,011
Denmark	55	517	1,985,094	373,492	30.88	23,900,000	3,793,301
Netherlands	101	894	1,941,883	498,435	106.67	28,900,000	3,640,256
Norway	92	885	1,116,874	311,208	697.88	21,200,000	2,377,223
Sweden	99	671	2,148,278	533,719	234.71	32,000,000	3,857,965

[a] Japan could not be included due to computational problems with the maximum likelihood estimation

Source: IHME (2009). Please note that all allocation figures are in constant 2007 US dollars.

A.2 Selection and average allocation decisions of major donors, per region and income group, 1990-2007
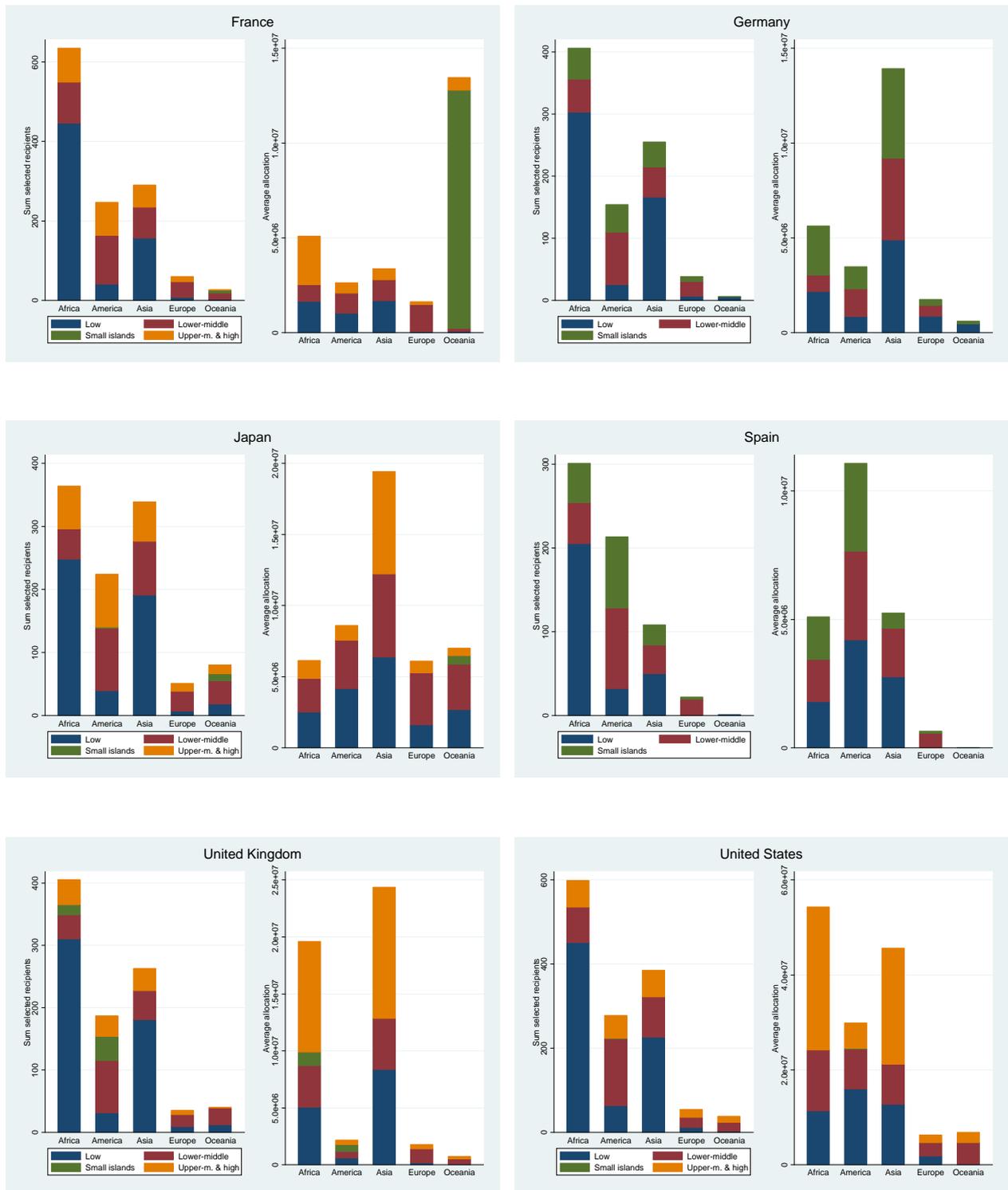
Source: IHME (2009). Please note that average allocations are in constant 2007 dollars.

Selection and average allocation decisions of like-minded donors, per region and income group, 1990-2007
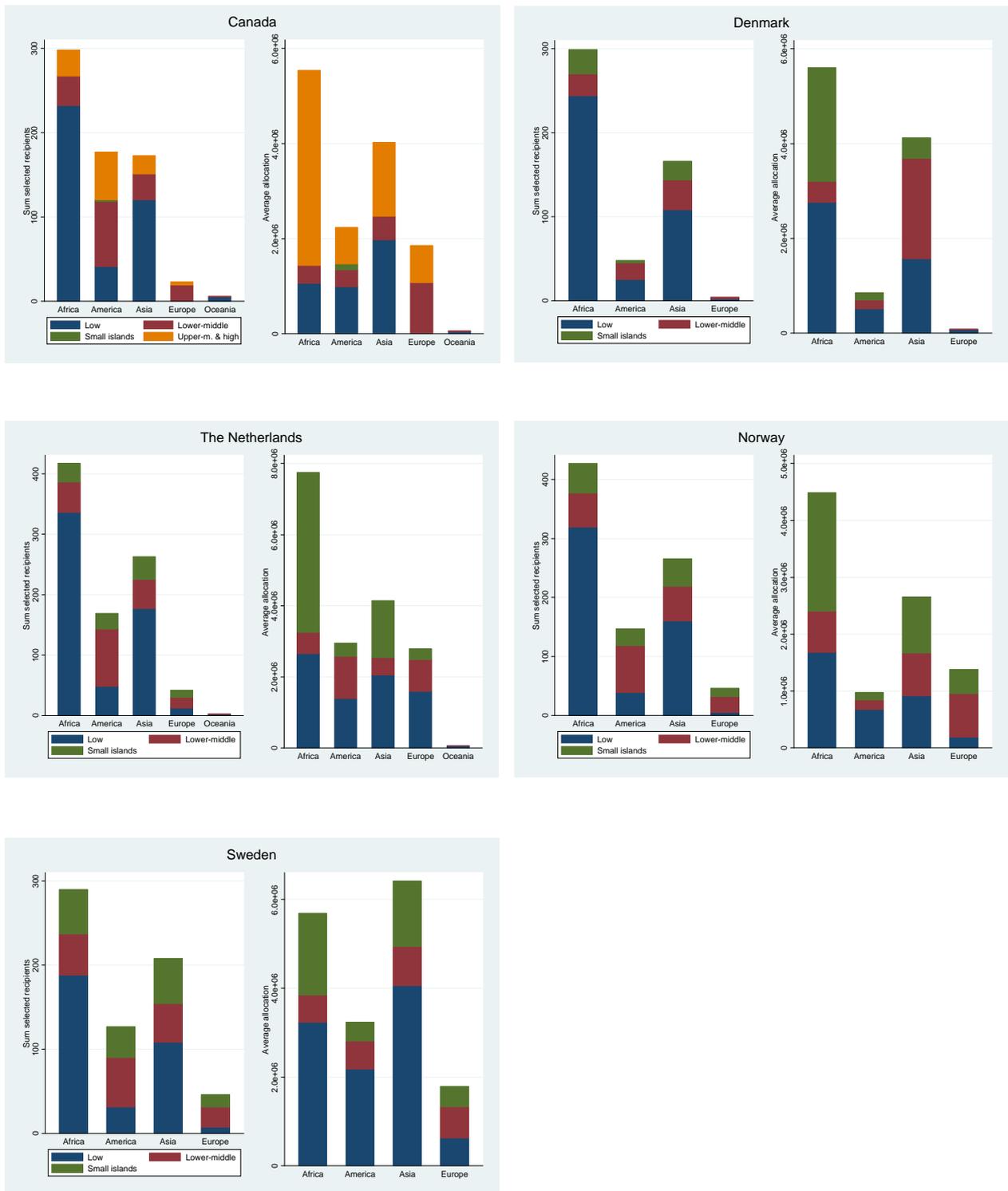
Source: IHME (2009). Please note that average allocations are in constant 2007 dollars.

Appendix B   Overview of the sample of recipients

Afghanistan	Eritrea	Morocco	Thailand
Albania°	Ethiopia	Mozambique	The Gambia
Algeria	Fiji*	Myanmar	Timor-Leste*
Angola	Gabon	Namibia	Togo
Anguilla*	Georgia	Nauru*	Tokelau
Antigua & Barbuda*	Ghana	Nepal	Tonga*
Argentina	Grenada*	Netherlands Antilles*	Trinidad & Tobago*
Armenia°	Guatemala	Nicaragua	Tunisia
Azerbaijan°	Guinea	Niger	Turkey
Bahrain	Guinea-Bissau*	Nigeria	Turkmenistan°
Bangladesh	Guyana*	Niue*	Turks & Caicos Is.
Barbados*	Haiti*	North Korea	Tuvalu*
Belarus°	Honduras	Northern Mariana Is.*	Uganda
Belize*	India	Oman	Ukraine°
Benin	Indonesia	Pakistan	Uruguay
Bhutan	Iran	Palau*	Uzbekistan°
Bolivia	Iraq	Palestinian Territory, Occupied	Vanuatu*
Bosnia & Herzegovina°	Jamaica*	Panama	Venezuela
Botswana	Jordan	Papua New Guinea*	Vietnam
Brazil	Kazakhstan°	Paraguay	Wallis & Futuna
Burkina Faso	Kenya	Peru	Yemen
Burundi	Kiribati*	Philippines	Zambia
Cambodia	Kyrgyzstan°	Rwanda	Zimbabwe
Cameroon	Laos	Samoa*	
Cape Verde*	Lebanon	Sao Tome & Principe*	
Central African Republic	Lesotho	Saudi Arabia	
Chad	Liberia	Senegal	
Chile	Libya	Serbia°	
China	Macedonia°	Seychelles*	
Colombia	Madagascar	Sierra Leone	
Comoros*	Malawi	Solomon Is.*	
Congo	Malaysia	Somalia	
Congo, DRC	Maldives*	South Africa	
Cook Is.*	Mali	South Korea	
Costa Rica	Malta	Sri Lanka	
Cote d'Ivoire	Marshall Is.*	St. Helena	
Croatia°	Mauritania	St. Kitts & Nevis*	
Cuba*	Mauritius*	St. Lucia*	
Djibouti	Mayotte	St. Vincent & the Grenadines*	
Dominica*	Mexico	Sudan	
Dominican Republic*	Micronesia*	Suriname*	
Ecuador	Moldova°	Swaziland	
Egypt	Mongolia	Syria	
El Salvador	Montenegro°	Tajikistan°	
Equatorial Guinea	Montserrat*	Tanzania	

Notes: 1. * denotes small island developing states following the UN definition (http://unstats.un.org/unsd/methods/m49/m49regin.htm). 2. ° denotes transitions countries following the UN definition (http://unstats.un.org/unsd/methods/m49/m49regin.htm#transition). 3. Yugoslavia is excluded to avoid double entries; Gibraltar as high-income country is excluded. 4. De facto dependencies: *France*: Mayotte, New Caledonia, Wallis & Futuna; *Netherlands*: Netherlands Antilles; *New Zealand*: Cook Is., Niue, Tokelau; *UK*: Anguilla, Falkland Is., Montserrat, St. Helena, Turks & Caicos Is.; *USA*: Northern Mariana Is., Palau.

Appendix C

C.1   Definition and sources of variables (selection and allocation decision)

Variable	Variable name	Definition	Source	Expected sign
Dependent variable (selection)				
DAH_{ijt}	DAH	Dummy (0 = no, 1 = country i received DAH from donor j in year t)	Ravishankar et al. (2009)	
DAH^*_{ijt}	DAH (latent)		Ravishankar et al. (2009)	
Dependent variable (allocation)				
$\ln DAH_{ijt}$	DAH	(Logged) DAH for recipient i by donor j in year t (US$)	Ravishankar et al. (2009)	
Health indicators				
$M_{i,t-1}$	Under five mortality	Probability of dying by age 5 per 1,000 live births in country i in year t-1 (in ‰)	Rajaratnam et al. (2010)	+
$Mm_{i,t-1}$	Maternal mortality	Annual number of female deaths during pregnancy, childbirth or within 42 days after per 1,000 live births in country i in year t-1 (in ‰)	Hogan et al. (2010)	+
$HIV_{i,t-1}$	Prevalence of HIV	Prevalence of HIV (% of population ages 15-49) in country i in year t-1	World Bank (2010)	+
Institutional quality indicators				
$Dem_{i,t-1}$	Democracy	An index on a scale of -10 (strongly autocratic) to +10 (strongly democratic) of country i in year t-1	Marshall et al. (2010)	+
$RL_{i,t-1}$	Rights and liberties	Measured on a scale from 1 to 7, with 7 reflecting the highest degree of political rights and civil liberties; of country i in year t-1	Freedom House (2009)	+
$Free_{i,t-1}$	Economic freedom	Measured on a 0 to 10 scale, with 10 representing the greatest degree of freedom; of country i in year t-1	Gwartney and Lawson (2009)	+
$CPI_{i,t-1}$	CPI	Corruption Perceptions Index ranges from 1 to 10, with higher values indicating higher levels of perceived corruption; of country i in year t-1	Transparency International (2010)	-
Effort indicators				
$Exp_{i,t-1}$	Public expenditure on health	Government health spending in country i in year t-1 (% of GDP)	Lu et al. (2010)	?
$Immun_{i,t-1}$	Immunization rates	Coverage of DTP3 (third dose of diphtheria toxoid, tetanus toxoid and pertussis vaccine) in country i in year t-1 (in %)	WHO (2011)	?
Competition indicators				
$USaid_{i,t-1}$	US aid	(Logged) US aid recipient i in year t-1 (US$)	Ravishankar et al. (2009)	?
$\ln \sum_{j*}^{7} DAH_{i,}$	Multilateral aid	(Logged) Total DAH that recipient i received from multilateral donors $j*$ in year t-1 (in US$)	Ravishankar et al. (2009)	?

(continued)

Variable	Variable name	Definition	Source	Expected sign
Relationship indicators				
$\ln Ex_{ij,t-1}$	Exports	(Logged) Total exports from donor j to recipient i in year $t-1$	Barbieri et al. (2008)	+
$Pol_{i,t-1}$	Political integration	Degree of political globalization of country i in year $t-1$ (in %)	Dreher (2006)	+
$Social_{i,t-1}$	Social integration	Degree of social globalization of country i in year $t-1$ (in %)	Dreher (2006)	+
$\ln Col_{ij}$	Own colony	(Logged) Number of years since 1900 in which country i was a colony of donor j	Correlates of War 2 Project (2006)	+
$\ln ColOth_{ij*}$	Other colony	(Logged) Number of years since 1900 in which country i was a colony of other $(j*\neq j)$	Correlates of War 2 Project (2006)	-
$\ln Dist_{ij}$	Bilateral distance	(Logged) Geodesic (great circle) distance between donor's and recipient's capitals	CEPII (2010); Byers (1997); CIA (2010)	-
Control variables				
$\ln Y_{i,t-1}$	GDP p.c.	(Logged) Income per capita in country i in year $t-1$	World Bank (2010)	-
$\ln Pop_{i,t-1}$	Population	(Logged) Population in country i in year $t-1$	UN Statistics Division (2010); World Bank (2010); CIA (2010)	-
$HDI_{i,t-1}$	HDI	Human Development Index in country i in year $t-1$ (in %)	UNDP (2010)	-
$\ln DAH_{ij,t-1}$	DAH	(Logged) DAH for recipient i by donor j in year $t-1$ (US$)	Ravishankar et al. (2009)	+

C.2   Descriptive statistics, major donors

France

Variable	Obs.	Mean	Minimum	Maximum	Std. Dev.
Health aid°	1,203	1,422,587	0.16	45,900,000	3,438,127
Population	1,203	49,900,000	15,283	1,300,000,000	174,000,000
GDPpc	1,156	1,628	85	10,453	1,926
Under-five mortality	1,191	86.7	6.0	301.5	64.8
Maternal mortality	1,169	4.1	0.1	21.1	3.9
HIV prevalence	846	2.5	0.0	28.9	4.8
HDI	1,098	54.6	4.5	93.1	20.5
Democracy	1,065	0.8	-10.0	10.0	6.2
Rights and liberties	1,169	3.9	1.0	7.0	1.7
Economic freedom	803	5.7	2.9	8.0	1.0
CPI	485	3.7	0.4	10.0	1.8
Health expenditure	801	1.8	0.0	4.9	1.0
Immunization	1,178	74.3	6.0	99.0	22.2
US aid	1,156	6,818,025	0	104,000,000	13,000,000
Multilateral aid	1,182	16,500,000	-2,168	352,000,000	40,700,000
Exports	938	447,000,000	1,100,000	12,600,000,000	1,020,000,000
Political integration	1,197	56	1	94	20
Social integration	1,187	32.31	4.68	75.44	15.33
Own colony	1,203	16	0	77	26
Other colony	1,203	20	0	81	29
Distance	1,203	6,573	1,082	16,595	2,855
Aid	1,203	1,372,296	0	45,900,000	3,437,858

Germany

Variable	Obs.	Mean	Minimum	Maximum	Std. Dev.
Health aid°	772	2,539,697	791	54,400,000	4,822,694
Population	772	58,800,000	438,971	1,300,000,000	180,000,000
GDPpc	754	1,054	85	8,216	1,255
Under-five mortality	772	90.1	5.5	247.2	56.5
Maternal mortality	772	4.6	0.1	20.5	4.0
HIV prevalence	615	3.2	0.0	27.3	5.3
HDI	733	53.3	7.4	93.1	17.4
Democracy	748	1.5	-10.0	10.0	6.1
Rights and liberties	754	4.1	1.0	7.0	1.6
Economic freedom	563	5.8	2.9	8.0	0.9
CPI	440	3.4	0.4	10.0	1.8
Health expenditure	607	1.7	0.0	5.1	1.0
Immunization	766	76.4	18.0	99.0	19.9
US aid	759	10,300,000	0	104,000,000	14,700,000
Multilateral aid	772	23,100,000	0	352,000,000	48,000,000
Exports	595	640,000,000	910,000	35,900,000,000	2,850,000,000
Political integration	772	59	8	93	19
Social integration	770	30.54	2.83	68.14	13.14
Own colony	772	2	0	16	5
Other colony	772	27	0	75	29
Distance	772	6,748	772	13,696	2,608
Aid	772	2,209,092	0	54,400,000	4,524,361

Japan					
Variable	Obs.	Mean	Minimum	Maximum	Std. Dev.
Health aid°	922	3,951,923	838	91,900,000	7,010,278
Population	922	54,300,000	9,245	1,300,000,000	185,000,000
GDPpc	895	1,482	86	11,180	1,723
Under-five mortality	908	72.2	5.5	301.5	52.6
Maternal mortality	885	3.6	0.1	21.1	3.6
HIV prevalence	624	2.8	0.0	28.9	5.6
HDI	818	58.6	4.8	90.3	17.4
Democracy	800	1.4	-10.0	10.0	6.2
Rights and liberties	895	4.1	1.0	7.0	1.7
Economic freedom	586	5.9	2.3	8.0	0.9
CPI	471	3.4	0.4	10.0	1.7
Health expenditure	644	1.9	0.0	6.4	1.1
Immunization	909	80.6	13.0	99.0	17.6
US aid	879	9,220,130	0	411,000,000	19,800,000
Multilateral aid	908	17,500,000	-2,609	344,000,000	39,100,000
Exports	216	2,760,000,000	150,000	26,000,000,000	4,990,000,000
Political integration	914	55	8	93	21
Social integration	910	34.11	2.83	75.44	14.20
Own colony	922	0	0	35	2
Other colony	922	30	0	91	29
Distance	922	10,000	1,157	18,587	4,015
Aid	922	2,975,407	0	91,900,000	5,984,632

Spain					
Variable	Obs.	Mean	Minimum	Maximum	Std. Dev.
Health aid°	572	2,439,070	3,222	41,800,000	4,741,146
Population	572	57,900,000	140,131	1,300,000,000	192,000,000
GDPpc	561	1,642	85	13,497	1,802
Under-five mortality	572	77.3	5.5	291.8	58.9
Maternal mortality	572	4.0	0.1	20.5	4.2
HIV prevalence	467	2.6	0.0	28.9	4.5
HDI	538	59.0	7.9	89.3	17.4
Democracy	531	2.5	-9.0	10.0	5.7
Rights and liberties	556	3.9	1.0	7.0	1.6
Economic freedom	436	6.0	2.9	8.0	0.9
CPI	381	3.6	1.2	9.0	1.8
Health expenditure	502	2.0	0.0	5.5	1.1
Immunization	562	77.6	6.0	99.0	20.1
US aid	571	10,900,000	0	411,000,000	22,800,000
Multilateral aid	572	27,200,000	0	352,000,000	52,500,000
Exports	360	146,000,000	150,000	2,720,000,000	358,000,000
Political integration	572	63	8	94	18
Social integration	572	35.19	5.90	75.01	13.86
Own colony	572	1	0	60	7
Other colony	572	25	0	77	29
Distance	572	6,410	707	15,549	2,829
Aid	572	2,031,235	0	41,800,000	4,407,174

UK					
Variable	Obs.	Mean	Minimum	Maximum	Std. Dev.
Health aid°	883	4,187,514	1,725	161,000,000	10,300,000
Population	883	61,200,000	6,409	1,300,000,000	195,000,000
GDPpc	802	1,074	93	8,638	1,346
Under-five mortality	829	91.6	5.5	286.1	58.5
Maternal mortality	810	4.3	0.1	20.0	3.6
HIV prevalence	622	3.6	0.0	28.9	6.2
HDI	763	51.7	4.8	89.5	18.9
Democracy	773	1.5	-9.0	10.0	5.8
Rights and liberties	801	4.0	1.0	7.0	1.6
Economic freedom	547	5.6	2.9	7.5	1.0
CPI	328	3.3	0.4	10.0	1.7
Health expenditure	531	1.7	0.0	5.1	1.0
Immunization	817	74.9	12.0	99.0	20.9
US aid	867	8,804,715	0	104,000,000	13,800,000
Multilateral aid	829	20,300,000	-2,609	352,000,000	45,700,000
Exports	664	355,000,000	0	11,200,000,000	1,020,000,000
Political integration	829	55	8	92	20
Social integration	829	29.10	4.52	68.63	13.16
Own colony	883	24	0	91	31
Other colony	883	10	0	75	21
Distance	883	7,371	1,341	16,318	2,728
Aid	883	3,507,246	0	161,000,000	9,209,894

US					
Variable	Obs.	Mean	Minimum	Maximum	Std. Dev.
Health aid°	1,256	11,000,000	43	411,000,000	21,100,000
Population	1,256	42,100,000	9,536	1,300,000,000	140,000,000
GDPpc	1,211	1,188	82	13,497	1,401
Under-five mortality	1,244	91.9	5.5	301.5	61.6
Maternal mortality	1,237	4.3	0.1	21.1	4.0
HIV prevalence	967	2.9	0.0	28.9	5.4
HDI	1,113	52.6	4.5	93.1	19.8
Democracy	1,170	1.2	-10.0	10.0	6.1
Rights and liberties	1,219	4.1	1.0	7.0	1.6
Economic freedom	855	5.7	2.9	8.0	0.9
CPI	495	3.4	0.4	10.0	1.8
Health expenditure	764	1.7	0.0	5.1	1.0
Immunization	1,230	74.4	10.0	99.0	21.9
US aid	1,200	9,696,315	0	411,000,000	17,700,000
Multilateral aid	1,231	16,300,000	0	352,000,000	41,200,000
Exports	1,200	2,190,000,000	890,000	140,000,000,000	11,500,000,000
Political integration	1,255	55	2	93	20
Social integration	1,244	30.41	2.83	70.24	14.30
Own colony	1,256	1	0	43	5
Other colony	1,256	26	0	81	28
Distance	1,256	9,411	2,016	16,371	3,546
Aid	1,256	9,263,995	0	411,000,000	17,400,000

C.3 Descriptive statistics, like-minded donors

Canada					
Variable	Obs.	Mean	Minimum	Maximum	Std. Dev.
Health aid°	630	996,639	218	26,300,000	2,201,104
Population	630	70,400,000	19,350	1,300,000,000	214,000,000
GDPpc	608	1,224	85	9,808	1,503
Under-five mortality	626	86.1	6.0	268.2	58.1
Maternal mortality	624	4.3	0.1	19.9	3.6
HIV prevalence	455	3.4	0.0	28.8	5.8
HDI	533	53.7	11.1	93.1	18.8
Democracy	592	1.6	-10.0	10.0	6.2
Rights and liberties	614	3.9	1.0	7.0	1.7
Economic freedom	502	5.7	2.3	8.0	0.9
CPI	309	3.5	0.4	10.0	1.8
Health expenditure	394	1.8	0.0	5.5	1.1
Immunization	622	75.3	13.0	99.0	20.3
US aid	563	11,700,000	0	104,000,000	15,800,000
Multilateral aid	628	21,700,000	0	352,000,000	46,900,000
Exports	610	208,000,000	0	8,700,000,000	837,000,000
Political integration	628	60	8	94	19
Social integration	628	30.51	2.83	66.61	14.15
Own colony	630	0	0	0	0
Other colony	630	28	0	81	28
Distance	630	9,137	2,556	15,655	3,380
Aid	630	776,625	0	23,300,000	1,851,976

Denmark					
Variable	Obs.	Mean	Minimum	Maximum	Std. Dev.
Health aid°	479	1,986,591	31	23,900,000	3,778,919
Population	479	70,800,000	510,557	1,300,000,000	210,000,000
GDPpc	466	661	102	5,178	756
Under-five mortality	479	108.2	11.2	273.2	59.2
Maternal mortality	479	5.3	0.1	20.7	4.1
HIV prevalence	369	4.1	0.0	28.9	6.2
HDI	434	45.0	4.8	88.9	18.2
Democracy	469	0.9	-10.0	10.0	6.3
Rights and liberties	473	3.8	1.0	6.5	1.5
Economic freedom	344	5.5	2.3	7.2	1.0
CPI	180	3.2	0.4	9.0	1.5
Health expenditure	283	1.7	0.0	4.6	1.0
Immunization	473	73.6	6.0	99.0	19.9
US aid	458	13,900,000	0	411,000,000	24,900,000
Multilateral aid	479	19,800,000	0	352,000,000	48,200,000
Exports	405	43,300,000	0	1,890,000,000	139,000,000
Political integration	479	56	8	92	19
Social integration	479	24.92	5.13	60.28	11.15
Own colony	479	0	0	0	0
Other colony	479	32	0	75	28
Distance	479	7,001	1,651	11,104	2,059
Aid	479	1,796,342	-66,234	23,900,000	3,649,478

Netherlands					
Variable	Obs.	Mean	Minimum	Maximum	Std. Dev.
Health aid°	864	1,806,411	107	28,900,000	3,341,069
Population	864	51,500,000	40,130	1,270,000,000	162,000,000
GDPpc	822	1,001	69	9,128	1,250
Under-five mortality	858	97.4	7.2	301.5	64.2
Maternal mortality	858	4.4	0.1	20.0	3.8
HIV prevalence	635	3.3	0.0	28.9	5.9
HDI	772	50.2	6.4	91.6	20.2
Democracy	804	1.2	-10.0	10.0	6.0
Rights and liberties	840	3.7	1.0	7.0	1.6
Economic freedom	577	5.5	2.3	7.5	1.0
CPI	298	3.4	0.4	10.0	1.7
Health expenditure	515	1.7	0.0	4.7	0.9
Immunization	846	73.1	6.0	99.0	22.0
US aid	832	8,848,782	0	86,000,000	13,400,000
Multilateral aid	862	14,800,000	0	352,000,000	38,500,000
Exports	681	121,000,000	100,000	2,380,000,000	243,000,000
Political integration	864	55	3	93	19
Social integration	859	28.11	4.11	70.78	13.99
Own colony	864	2	0	62	11
Other colony	864	27	0	75	28
Distance	864	6,639	1,085	16,184	2,473
Aid	864	1,615,534	0	27,700,000	3,091,809

Norway					
Variable	Obs.	Mean	Minimum	Maximum	Std. Dev.
Health aid°	824	1,070,412	698	19,800,000	2,201,041
Population	824	64,700,000	508,695	1,300,000,000	201,000,000
GDPpc	790	1,116	85	10,003	1,365
Under-five mortality	824	91.2	5.5	268.2	57.3
Maternal mortality	824	4.7	0.1	20.0	3.9
HIV prevalence	633	4.2	0.0	28.9	6.7
HDI	737	52.2	6.6	89.3	17.6
Democracy	778	1.6	-10.0	10.0	6.1
Rights and liberties	800	3.9	1.0	6.5	1.6
Economic freedom	572	5.7	2.3	7.5	1.0
CPI	389	3.5	0.4	10.0	1.9
Health expenditure	583	1.8	0.0	5.1	1.0
Immunization	811	73.7	12.0	99.0	21.2
US aid	796	10,400,000	0	411,000,000	20,300,000
Multilateral aid	824	19,900,000	0	352,000,000	43,800,000
Exports	609	25,700,000	0	1,660,000,000	120,000,000
Political integration	824	56	8	92	19
Social integration	820	29.30	5.13	71.66	13.94
Own colony	824	0	0	0	0
Other colony	824	29	0	75	28
Distance	824	7,345	1,609	12,747	2,325
Aid	824	936,441	0	19,800,000	2,052,453

			Sweden		
Variable	Obs.	Mean	Minimum	Maximum	Std. Dev.
Health aid°	577	2,236,033	235	32,000,000	3,879,800
Population	577	76,500,000	860,755	1,300,000,000	232,000,000
GDPpc	550	1,227	78	7,501	1,342
Under-five mortality	577	84.3	5.5	245.8	60.8
Maternal mortality	577	4.1	0.1	20.0	3.8
HIV prevalence	406	4.6	0.0	28.9	7.2
HDI	507	53.7	6.9	93.1	19.3
Democracy	537	1.7	-9.0	10.0	6.2
Rights and liberties	551	3.9	1.0	7.0	1.7
Economic freedom	406	5.7	2.3	8.0	1.1
CPI	283	3.3	0.4	9.0	1.6
Health expenditure	331	1.8	0.0	5.1	1.1
Immunization	558	76.7	13.0	99.0	20.4
US aid	539	11,800,000	0	411,000,000	23,500,000
Multilateral aid	577	20,300,000	0	352,000,000	46,600,000
Exports	405	138,000,000	0	3,940,000,000	445,000,000
Political integration	577	57	8	93	19
Social integration	577	30.84	5.20	75.01	14.93
Own colony	577	0	0	0	0
Other colony	577	26	0	75	29
Distance	577	7,216	838	13,104	2,672
Aid	577	1,918,089	-42,900	32,000,000	3,715,070

Please note: 1. For expositional reasons, the tables list unlogged values only. 2. Std. Dev. = Standard deviation.

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