Is the allocation of food aid free from donor interest bias?

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Many studies demonstrate that donor interest, particularly in the form of economic export and military-strategic interests, is an important determinant in the allocation of general development assistance. Does this hold true for food aid as well? This article analyses the allocation of food aid in the 1990s by the world's three biggest donors as well as non-governmental organisations (NGOs). It finds some evidence for donor interest bias, particularly in the form of preferential treatment of geographically close countries. However, neither military-strategic nor export interests seem to matter. Former Western colonies are also not treated differently. Instead, particularly European Union, multilateral and NGO food aid allocation appears quite sensitive towards recipient countries' needs.

I. INTRODUCTION

There is by now a long list of studies examining the allocation of general aid (see Neumayer [2003a] for an overview). In comparison, the allocation of food aid has been somewhat neglected. Partly this might be due to the fact that it represents only a small share of overall official development assistance (ODA), namely around 3 per cent in 1998, down from 22 per cent in 1965 [Webb, 2000]. The peculiarities of food aid make an analysis of its allocation across countries worth while, however.

The literature analysing the allocation of general aid across recipient countries in the wake of McKinlay and Little [1977] distinguishes between two main groups of determinants: donor interest and recipient need. Food aid is likely to be seen by the general public as more humanitarian in nature and more oriented towards recipient need than general ODA. We want to test whether donor interest impacts upon the allocation of food aid across countries and therefore distorts an allocation based on recipient need only.

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The Food Aid Convention (FAC), which provides guidance for international food aid allocation, stresses that donors should give priority to recipient need (Art. I (b), Art. VII (c) and Art. VIII (b) of the FAC in its form of 1999). The perception of a humanitarian nature of food aid is particularly true for emergency food aid deliveries. Television pictures of donors handing out food aid to undernourished suffering men, women and children in developing countries dominate the public perception. For this reason, one might expect emergency food aid to be particularly strongly determined by recipient need. On the other hand, some observes such as Clay [2002: 204] believe that emergency aid is 'intrinsically political', which would imply that, instead, it might be particularly subject to donor interest. We therefore want to test whether the allocation of total food aid and emergency food aid in particular is free from donor interest bias. The share of emergency food among total food aid rose in the 1990s to a peak of 40 per cent in 1997 [Webb, 2000]. This development came mainly at the expense of a reduced share of programme food aid [Clay and Stokke, 2000]. Emergency aid consists of food to victims of natural and man-made disasters such as earthquakes, floods, famines, military conflict and the like. Programme aid is often provided to the recipient government or its agents where the food is sold on local markets. Yet another category, project aid, is provided to targeted groups for the support of specific development projects.

Donors differ in the emphasis they put on donor interest versus recipient need, at least in their official proclamations. Historically, justification for United States (US) food aid has officially embraced US domestic agricultural and foreign policy interests. For example, the 1954 legislation establishing US food aid listed the development of export markets, the containment of communism and the reward to loyal allies as objectives of food aid in addition to humanitarian concerns [Diven, 2001: 456].

However, later legislation in 1974 tried to strengthen recipient need as the major criterion for US food aid allocation [Zahariadis et al., 2000: 667]. In comparison, recipient need has been stressed as the main priority by the European Union (EU) for its food aid from the start [Cathie, 1997]. Art. 2 of the 1986 regulation as well as Art. 1 of the 1996 regulation on Food-aid Policy and Food-aid Management state as objectives of EU food aid the promotion of food security, raising the standard of nutrition, help in emergencies and the support of self-sufficiency in food production (OJ L 370/1 1986; OJ L 166 1996). Art. 2 of both regulations also stress that 'food aid shall primarily be allocated on the basis of an objective evaluation of the real needs' of recipient countries.

In our test of whether donor interest biases the allocation of food aid across countries, we will focus on the 1990s as one would expect that the end of the Cold War opened the way for providing food aid to those really in need instead of those in which donors have economic, political and military-strategic interests. We will concentrate here on aid from the US, EU food aid allocated by the European Commission (EC), the United Nations' World Food Programme (WFP) and non-governmental organisations (NGOs).[1] Table 1 shows that the first three are the world's largest food aid donors. NGO food aid represents a relatively small share of world food aid, but it has not been analysed before and we want to see whether it is free from any donor interest bias as one might expect given the humanitarian mission of practically all NGOs.

< Insert Table 1 about here >

We are not addressing the issue of what determines the overall supply of food aid by donors. Minimum annual obligations are set by the regularly revised FAC, but anything going beyond that is subject to the discretion of the donor. Many studies show

that the overall supply is heavily influenced by domestic agricultural surpluses in donor countries and world prices for cereals [Gilbert, 1996; Barrett, 1998; Webb, 2000; Diven, 2001]. We are merely interested in the allocation of aid across countries and control for temporary changes in the total supply of food by year-specific time dummy variables. The effectiveness of food aid in terms of agricultural development is also highly contested [Ruttan, 1993; Barrett, 1998]. This is in accordance with recent analyses doubting the effectiveness of general ODA, unless it is targeted to countries with good governance [World Bank, 1998]. A separate, but related, debate is on whether aid for addressing food shortages should be delivered in the form of actual food or should consist of financial aid for the alleviation of hunger and poverty [Reutlinger, 1999]. We will not engage with these discussions. Again, we are merely interested in the determinants of food aid allocation here, not in its effectiveness or best way of delivery.

II. REVIEW OF EMPIRICAL STUDIES

Most empirical studies have focused on US food aid allocation. Eggleston [1987] finds that food aid allocation over the period 1955 to 1979 is influenced by both recipient need and US political and military interests. Shapouri and Missiaen [1990] similarly find for the years 1975 and 1985 that both recipient need, friendly political ideology and economic export interests impact upon US food aid allocation. Other than that, they find no major change between the two time periods. Ball and Johnson [1996] disentangle food aid and examine whether the allocation of different components of US food aid across African recipient countries have been driven by different determinants. In particular, they look at Title I aid, which is most explicitly tied to donor interest in the underlying legislation and which provides concessional credit to developing countries for the purchase of food, and Title II aid, which is more explicitly humanitarian and

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often provided through the WFP. In addition, they also examine whether the determinants changed over time from the 1970s to the 1980s. Over the period as a whole and for all US food aid taken together as well as Title I aid, donor interest in the form of arms exports and voting similarity at the United Nations is found to be the most important determinant. For Title II aid, however, the donor interest variables are statistically insignificant and recipient need is more important than for total food aid. Looked at over time, Ball and Johnson [1996] find that donor interest has become less important in the 1980s compared to the 1970s, whereas the opposite is the case for recipient need. They explain this with 'the waning influence of the Cold War' [Ball and Johnson, 1996: 530], which they argue took effect from the mid-1980s onwards, that is long before the fall of the Berlin Wall.

Zahariadis et al. [2000] are the first to distinguish between two stages of US food aid allocation in their analysis of Title I and Title II food aid to Sub-Saharan African countries over the period 1978 to 1990. The general aid allocation literature had made this distinction much earlier already [Dudley and Montmarquette, 1976; Cingranelli and Pasquarello, 1985]. In the first stage, sometimes called gate-keeping stage, countries are selected as eligible or not for aid. In the second or level stage, it is determined how much aid goes to eligible countries. Zahariadis et al. [2000] find that donor interest in the form of US security concerns and trade interests plays a role in the selection of countries as eligible for Title I aid in addition to recipient need. In contrast, donor interest plays no role for the amount of Title II food aid allocated to eligible countries.[2]

With respect to donors other than the US, Shapouri and Missiaen [1990] find that donor interest, particularly in the form of trade interests, is also a statistically significant determinant of Canadian and EU food aid allocation besides recipient need. Herrmann et al. [1992] confirm the importance of recipient need for EU food aid allocation over

the years 1983 to 1985. This result needs to be treated with care, however, since they do not control for donor interest. The same is true for a background paper to a Joint Evaluation of European Union Programme Food Aid undertaken by the Overseas Development Institute. Contrary to Herrmann et al. [1992], it found less evidence for the impact of recipient need on EU food aid allocation as there is 'only a weak relationship between actual food aid allocations and variables approximating closely to indicators stated by donors as influencing their allocations. Allocations do not reflect direct and simple targeting according to indicators such as per capita income or balance-of-payments problems and food availability in recipient countries' [ODI 1996, para. 2.5.2]. Note, however, that the latter study only examined programme food aid, whereas Herrmann et al. [1992] look at total food aid.

At the aggregate level, the general aid allocation literature usually finds multilateral aid to be more sensitive to recipient need and less sensitive to donor interest than bilateral aid [Neumayer, 2003a, 2003b]. For food aid as well, there is 'a widespread belief that multilateral assistance is more effective in reaching intended beneficiaries (…) because it is allocated more according to recipients' needs than donors' needs' [Barrett and Heisey, 2002: 479]. Note that unlike general ODA, where there is a multitude of multilateral donors, almost all multilateral food aid is channelled through the WFP. The mission statement of the WFP postulates that it 'will concentrate its efforts and resources on the neediest people and countries' [WFP, 2003]. Surprisingly, however, there is only weak and somewhat ambiguous evidence that multilateral food aid allocation is actually more sensitive to recipient need.

Shapouri and Missiaen [1990] find multilateral aid to be more responsive to recipient need in 1985 than in 1975. This result needs to be treated with care, however, as it derives from a model, in which recipient need variables are the only explanatory

variables included and donor interest is missing. A couple of other studies suffer from the same problem. Barrett [2001] does not directly analyse the determinants of food aid allocation, but he examines whether US food aid over the period 1961 to 1995 goes to countries with lower food availability (progressivity) and whether it stabilises short-falls in trend line food production over time (stabilisation). He finds neither to be the case, independently of whether total food aid or the components of it are looked at. Barrett and Heisey [2002] repeat the analysis for WFP aid over the period 1975 to 1998, finding evidence for both progressivity and stabilisation.[3] This result is somewhat at odds with a study undertaken by Gabbert and Weikard [2000]. They use a complex formula for measuring under-nourishment as an indicator of recipient need, which is criticised by Barrett and Heisey [2002: 489] as being based on 'inherently arbitrary assumptions about intranational food distribution'. Gabbert and Weikard [2000] find that Canadian and EU food aid over the period 1990 to 1996 is more targeted at recipient need than US or WFP aid. Japan is somewhat ambiguous as its project aid is strongly targeted at recipient need, whereas the opposite is true for its emergency aid. Emergency food aid is more targeted at recipient need than programme or project aid with the exception of Japan. Interesting though these results are, the failure to include donor interest variables means that nothing can be inferred about these and, more importantly, that the results could suffer from omitted variable bias if the examined recipient need variables are correlated with the omitted donor interest variables. A recent study by McGillivray [2003] stresses the importance of including both recipient need and donor interest variables in aid allocation models and highlights the bias in regression results following from a failure to do so for the case of US general ODA allocation.

Barrett and Heisey [2002: 489] explain their result that WFP food aid is both progressive and stabilising by saying that it 'reflects the fact that where bilateral donors distribute food aid for multiple motives related to export promotion, farm surplus disposal, and geopolitical interests, with food security in recipient countries a decidedly less prominent concern, the WFP is designed to focus on the latter concern as much as possible'. However, one would want to test for the irrelevance of donor interest in WFP aid allocation as opposed to bilateral allocation, rather than assume it. Such a test is undertaken here. This is the first study to analyse comprehensively food aid flows in the 1990s from the major donors explicitly testing whether the allocation of food aid is free from donor interest bias.

III. RESEARCH DESIGN

Dependent variables

The correct accounting of what amounts to food aid is not without problems [Clay and Stokke 2000: 21]. Food aid can consist of food being delivered or of financial assistance provided that is tied to the purchase of food by the recipient ('aid for food'). In this analysis, food aid means the delivery of food and is measured in tons of wheat equivalent. This is the only definition of food aid that can be analysed as no comprehensive data exist on financial aid flows for the purpose of food purchasing ('aid for food'). We look at total food aid as well as one of its sub-categories, namely emergency aid. As mentioned above, there are arguments why emergency aid might be more or less biased towards donor interest than total food aid. The data come from the so-called INTERFAIS database and have been provided courtesy of the WFP. Note that in our analysis that part of US food aid, which comes under Title II of Public Law 480 and is channelled to recipient countries via the WFP, is counted as WFP rather than US

food aid as it is the ultimate responsibility of the WFP to allocate these resources. Food aid under Title I and Title III is counted as US food aid as it is not channelled to recipient countries via the WFP.

The general aid allocation literature disagrees on whether total ODA should be the dependent variable or ODA per capita. The latter elegantly controls for the fact that recipient countries differ tremendously in their population sizes. If total ODA is taken to be the dependent variable, then at the least population size *must* be one of the explanatory variables to account for the fact that, all other things equal, very populous countries are likely to receive more aid than very small ones. Which variable to choose should be the result of a careful consideration of the way donors are likely to allocate aid and should approximate their actual decision-making behaviour best. In most cases, it seems reasonable to presume that there is an overall fixed amount of (food) aid to be allocated. Given this overall constraint, McGillivray and Oczkowski [1992: 1314] are correct in arguing that 'distributing aid in per capita terms in this context is both a difficult and cumbersome task' as care needs to be taken neither to overshoot nor undershoot the fixed overall amount of money available. It is much easier for donors to allocate a share of the total amount of aid available to each recipient country. As McGillivray and Oczkowski [ibid.] point out, in this process of dividing the cake 'aid decision makers may well be aware of the corresponding per capita amounts, and may well adjust absolute amounts on this basis, but this is taken to represent a response to country size. In this context, per capita aid allocations are viewed as the outcome of this process rather than the prime consideration.' We therefore take the amount of food aid provided to a recipient country to be the dependent variable and include population size as a control variable (data from World Bank [2001]). We believe that this variable approximates best the way donors undertake their aid allocation decisions.

<u>Independent variables</u>

The single most common and frequently only variable of recipient need included in studies of general aid allocation is a country's level of income. GDP per capita data in purchasing power parity were generally taken from World Bank [2001] and complemented by WHO [2000]. They were converted into constant US$ of 1997 with the help of the US GDP deflator. In addition, we include a number of variables capturing more specifically food aid need. The average daily per capita calorie supply in thousand calories is taken from UN [1997] and supplemented by FAO [2003]. An index of self-sufficiency is constructed from data in FAO [2003] and is defined as domestic cereal production divided by the sum of domestic cereal production, commercial imports and stock changes. Particularly for emergency aid, natural and man-made disasters and complex emergencies trigger a need in affected countries for food assistance. As one measure we include the total number of refugees in tens of thousands being hosted by a country with data taken from UNHCR [2002].

We will use a whole range of variables commonly used in the general aid allocation literature that cover different aspects of donor interest. First, we use a variable measuring the number of years a recipient country has been a colony of the donor between 1900 and 1960 (data from Alesina and Dollar [2000]). Former colonial powers usually have remaining political, economic, cultural and other interests in their former colonies. This variable was not included in the case of US aid allocation as the Philippines are the only former US colony in the sample. For aid allocation by the EU the variable refers to being a former colony of any EU member country. In the case of WFP and NGO aid, the variable counts the number of years a country has been the colony of any Western country. The second variable is the geographical distance

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between the donor and the recipient country's capital [Haveman, 2000]. Donors often tend to give more aid to geographically close countries in order to maintain a regional sphere of influence. In the case of EU aid allocation, this variable measures the distance to Brussels. For WFP and NGO aid, it measures the distance to either Washington D.C. or Brussels, whichever is smaller. Third, to see whether donors give preference to countries, in which they have a military-strategic interest, we include a variable measuring the share of United States military grants to this country (data from USAID [2002]). The idea behind using this variable is that countries that receive high United States military grants can be regarded as allied to Western donors and strategically important countries. Ideally, we would have liked to include similar information from other Western countries as well, but no sufficient data exist. Fourth, we use a variable measuring the amount of food exported from the donor to the recipient country as a share of total donor food exports (data from OECD [2002]). This variable functions as a proxy for the commercial food or trade interest of donors. Fifth, since we expect that it is in donors' interest to give aid to "friendly" and "close" countries, we employ two variables trying to approximate this interest. As a proxy for converging political viewpoints we use a political similarity variable that draws from voting behaviour in the UN General Assembly (data from Gartzke, Jo and Tucker [1999]). With respect to the last two variables, for WFP and NGO aid we use a weighted average between the US and the European value. The weighting is two thirds for the US and one third for the European value, which approximately reflects the relative size of commitment of the US and the EU countries according to the Food Aid Convention. Lastly, as a proxy for cultural similarity we use the percentage of Protestant and Catholic people living in a recipient country (data from Parker [1997]).

As a simple test for potential problems with multicollinearity among the explanatory variables, variance inflation factors were computed, which are well below three for all variables suggesting that there is no reason to be concerned about multicollinearity [Kennedy, 1992].

Estimation strategy

Like Zahariadis et al. [2000] and much of the general aid allocation literature, we distinguish between two stages, a first eligibility or gate-keeping stage and a second stage, in which the amount of aid going to eligible countries is determined. There are basically two ways to estimate such a model. One is to follow the lead of Dudley and Montmarquette [1976] and many others and to treat the two stages as independent (so-called two-part model). One of the problems with this two-part model is that it assumes that the errors in both stages are uncorrelated. In other words, it assumes that decisions at the gate-keeping stage are taken independently from the decisions at the level stage, which might be unrealistic.

The second method is Heckman's [1979] two-step estimator, which explicitly allows the error terms from both stages of aid allocation to be correlated. It has been used by, for example, McGillivray and Oczkowski [1992] in the aid allocation literature. One of the disadvantage of the two-step estimator is that it requires an exclusionary variable that has a significant impact upon the first step (gate-keeping stage), but not upon the second step (level stage).[4] Such a variable is commonly difficult to find. For this reason we use the two-part model for our estimations. In non-reported sensitivity analysis employing Heckman's two-step estimator without an exclusionary variable we found very little difference to the results reported here. We estimate the first stage with probit and standard errors that are robust towards arbitrary heteroscedasticity

and serial correlation. The second stage is estimated with a generalised estimating equations (GEE) random effects estimator with standard errors that in addition to robustness towards heteroscedasticity and serial correlation also allow observations to be independent across, but not necessarily within, countries (clustering). In both stages we also included year-specific time dummies to account for temporal changes in the overall amount of food aid provided.

The explanatory variables enter the regressions with a one year lag to mimic the state of information that allocators of food aid have at the time of decision-making. Lagging these variables also fulfils the purpose of mitigating any potential simultaneity bias given that the amount of food aid impacts upon the calorie supply and the food self-sufficiency of a country. With respect to the variables measuring need for food aid, one could argue that due to the existence of the Global Information and Early Warning System on Food and Agriculture (GIEWS), established in 1975 at the request of the 1974 World Food Conference, decision makers have access to more current data. The same is true for national alert systems such as the U.S. Agency for International Development's Famine Early Warning System (FEWS). However, in non-reported sensitivity analysis we found very little difference to the results reported below if we let the food recipient need variables enter the regressions without a lag.

The sample covers the period 1990 to 1999 and in principle contains all developing countries and countries in transition for which data on the explanatory variables are available (141 in total). The dependent variable is logged in order to make its distribution less skewed. This also improved the model fit substantially. The population size, income and geographical distance explanatory variables are logged for the same reason. Note, however, that the results reported below are little affected if, instead, these variables were not logged.

IV. RESULTS

We start with the US, the biggest food aid donor, for which estimation results are shown in table 2. At the gate-keeping stage, more populous countries as well as those with a lower per capita calorie supply are more likely to receive either total or emergency food aid. Poorer countries also have a higher chance of being eligible for total food aid. Contrary to expectation, countries hosting a greater number of refugees are *less* likely to receive total food aid. For both categories of aid, geographical proximity renders countries more likely to be eligible for aid. Countries with voting similarity in the UN general assembly are more likely to receive total food aid. Other biases towards donor interests are not apparent. With respect to the level stage, more populous, more food import dependent and geographically closer eligible countries receive a higher amount of total food aid. Neither population size, nor any of the recipient need or donor interest variables test statistically significantly for emergency food aid, however.

< Insert Table 2 about here >

Estimation results for the EU are presented in table 3. More populous, poorer, more food import dependent countries as well as those with a lower per capita calorie supply are more likely to receive both total and emergency food aid. Countries hosting a higher number of refugees are more likely to receive emergency food aid, but not total food aid. Geographical proximity renders countries more likely to receive either total or emergency food aid, countries with a higher share of Protestants and Catholics are also more likely to receive total food aid. No other donor interest bias is apparent at the gate-keeping stage. At the level stage, more populous and more food import dependent

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countries as well as those with a lower per capita calorie supply receive more total and emergency aid. The same is true for geographically closer countries. In addition, countries with voting similarity in the UN general assembly receive more emergency, but not more total food aid. No other donor interest bias is suggested by the estimation results.

< Insert Table 3 about here >

The WFP's food aid allocation is the dependent variable in the estimation results of table 4. More populous and poorer countries as well as those with a lower per capita calorie supply and those hosting more refugees are more likely to be eligible for total and emergency food aid. In addition, more food import dependent countries are more likely to receive total food aid. Donor interest does not bias the aid eligibility selection of emergency aid, but perhaps surprisingly countries with a higher share of Protestants and Catholics as well as those geographically closer to the US or Western Europe are more likely to receive total food aid. At the level stage, WFP total food aid is entirely free of donor interest bias. The same is true for emergency aid with the exception of voting similarity with Western countries. More populous and more food import dependent countries as well as those, which host a higher number of refugees, receive more total and emergency food aid. Poorer countries also receive more total food aid.

< Insert Table 4 about here >

Lastly, NGO donors' food aid allocation is examined in table 5. More populous countries and those, which host a higher number of refugees and have a lower per capita

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supply of calories, are more likely to receive both total and emergency food aid. A preference towards countries geographically closer to the US or Western Europe is apparent at the aid eligibility stage for both total and emergency aid. In addition, countries with voting patterns in the UN general assembly similar to Western countries are more likely to receive total food aid. At the level stage, with respect to recipient need it is only countries hosting more refugees that receive statistically significantly more aid than others. Perhaps surprisingly, countries, which receive a higher share of US military aid receive more food aid from NGOs. No other donor interest bias is apparent. These results hold for both total and emergency aid.

< Insert Table 5 about here >

It is possible to argue that for WFP and NGO food aid no influence of donor interest is to be expected and that the inclusion of such variables might lead to biased estimates for the recipient need variables due to model specification error. In non-reported sensitivity analysis we have therefore estimated the allocation of food aid by these two donors again with the donor interest variables excluded. The results for the remaining recipient need variables are very similar to the ones reported above, suggesting that potential specification error does not represent a major concern here.

V. DISCUSSION AND CONCLUDING OBSERVATIONS

Is food aid allocation free from donor interest? Not quite so, as the results of the analysis here have shown. In particular, almost all donors give preference to countries that are geographically close to the donor or to the US or Western Europe in case of WFP and NGO aid. The geographical proximity bias need not be interpreted strictly in

terms of donor interest as the attempt to maintain a regional sphere of influence. The plight of geographically closer countries is also more salient in the public perception and those of policy makers. In addition, in the case of the US and the EU the geographical bias could also imply that these donors are willing to assume responsibility for their respective regions. Food aid seems to be used sometimes to reward political allies as measured by similar UN general assembly voting patters. Perhaps more importantly, however, and contrary to general ODA, food aid is not used to reward countries in which donors have economic export interests. In non-reported sensitivity analysis we checked that this holds true not only for food, but for exports of all other goods and services as well. Neither do donors pursue military-strategic interests in food aid allocation. The only exception to this is NGO aid at the level stage, where major recipients of US military aid also receive more NGO food aid. This result could be down to chance of course. Equally, no bias towards former Western colonies is apparent. This represents quite an important result that stands in striking contrast to the allocation of general ODA. Interestingly, there is no difference apparent between the US on the one hand and the multilateral donors WFP and EU as well as NGOs on the other hand. This also stands in contrast to the allocation of general ODA, for which the US together with France is often found to promote vigorously its own interest [Neumayer, 2003a, 2003c].

One or the other aspect of recipient need impacts upon the food aid allocation of almost all donors at both stages and with respect to both emergency and total food aid. Not surprisingly, given the prominent humanitarian role of the WFP and NGOs in relieving food aid needs in disaster situations, we find that the number of refugees hosted has a statistically significant impact at both levels and for both emergency and total food aid of these donors. On the whole, EU food aid allocation seems to take

recipient need most comprehensively into account, whereas the opposite is the case for US food aid allocation. Even in the case of US food aid, however, it is only at the level stage of emergency aid that one or the other variable of recipient need does not test significantly.

Some have suggested that WFP food aid is not well allocated with respect to recipient need and have explained this with the fact that the WFP gives aid to a great many countries. 'The WFP has always followed a policy, as a UN agency, of the widest coverage with its multilateral donations of the maximum number of countries eligible to receive food aid, rather than concentrating its food resources in larger projects and programmes' [Cathie 1997: 104]. Gabbert and Weikard [2000: 213] similarly argue that the widespread WFP delivery of food aid 'is less effective, because it means that a large fraction of the aid goes to countries not having the most urgent needs'. However, our estimation results do not back this claim and instead support the opposite findings of Barrett and Heisey [2002] as WFP food aid allocation in the 1990s appears quite sensitive to recipient need throughout and at both stages.

Population size has a positive impact upon food aid allocation almost throughout. At the level stage, we are not surprised to find that more populous countries receive more food. Given that both the dependent and the population size variables are in natural logs, one can interpret the estimated coefficients as elasticities. With estimated elasticities of below one in all cases we find evidence that the well-known population bias of general ODA [Isenman, 1976] towards less populous countries in terms of *per capita* aid allocated carries over to food aid as well. The positive effect of population size at the food aid eligibility stage almost throughout is more puzzling, however. The bias is probably due to the higher saliency of more populous countries in the public mind and that of policy makers alike. It also represents some cause for concern,

however, as there is no reason to presume that less populous countries are any less in need of food aid than more populous ones.

All in all, the fact that food aid appears to be less biased towards donors' interests is to be welcomed from a normative point of view. Aid should be allocated on the basis of recipient need, not of donor interest. The allocation of food aid in the 1990s seems to comply with this requirement to a greater extent than general ODA. In particular, the "hard" economic export and military-strategic interests that impact upon much of the allocation of general ODA has no impact on the allocation of food aid.

In future research, it might be interesting to do a similar analysis for the period before 1990 to compare the results from before and after the end of the cold war more directly. Another direction worth taking would be to simulate what the allocation pattern of food aid would look like if it was entirely free from donor interest bias and to compare the results either with actual food allocations or the ones predicted by our estimated models. Such an analysis would shed even more light on how important the impact of donor bias on food aid allocation actually is.

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Table 1. FOOD AID IN THE 1990s.

	Total food aid	
Donor	Quantity	% of world food aid
EU	14700	12.28
NGO	1251	1.05
US	45300	37.85
WFP	32300	26.99
Total	119687	

	Emergency food aid	
Donor	Quantity	% of world food aid
EU	3557	9.52
NGO	908	2.43
US	5092	13.63
WFP	22200	59.44
Total	37347	

Note: Quantity in thousand tons of wheat equivalent.

TABLE 2. US FOOD AID ALLOCATION.

	Total		Emergency	
	1st stage	2nd stage	1st stage	2nd stage
	(Probit)	(GEE)	(Probit)	(GEE)
ln Population	0.077	0.420	0.022	0.329
	(6.36)**	(1.99)*	(4.43)**	(1.30)
ln GDP p.c.	-0.195	0.294	0.004	-0.064
	(6.63)**	(1.08)	(0.32)	(0.18)
Calorie supply	-0.139	-0.139	-0.119	-0.833
	(2.46)*	(0.36)	(4.17)**	(1.52)
Food self-sufficiency	0.066	-1.011	0.011	-0.906
	(1.14)	(2.39)*	(0.41)	(1.61)
# Refugees	-0.001	-0.004	0.000	0.004
	(2.25)*	(0.61)	(1.08)	(0.27)
US military aid	-0.018	-0.008	-0.067	-0.214
	(1.63)	(0.47)	(3.96)**	(0.39)
Share Food exports	-1.19	4.776	-1.228	41.242
	(0.72)	(0.27)	(1.09)	(1.60)
UN vote-similarity	0.366	0.154	-0.037	-0.153
	(5.25)**	(0.31)	(2.39)*	(0.18)
Distance	-0.331	-0.883	-0.028	0.434
	(9.09)**	(2.39)*	(2.63)**	(1.07)
% Protestant/Catholic	-0.002	-0.009	-0.001	-0.001
	(3.85)**	(1.58)	(6.42)**	(0.16)
Pseudo R^2	.21		.16	
r^2 (predicted/actual)		.15		.27
Observations	1330	545	1330	183
Countries	141	90	141	52

Note: Absolute z-values in parentheses. Coefficients of constant and year specific dummies not reported. The goodness of fit measure for the 2nd stage estimation is the squared correlation coefficient between predicted and actual levels of food aid.

* statistically significant at 95% level ** at 99% level

TABLE 3. EU FOOD AID ALLOCATION.

	Total		Emergency	
	1st stage	2nd stage	1st stage	2nd stage
	(Probit)	(GEE)	(Probit)	(GEE)
ln Population	0.073	0.534	0.055	0.562
	(5.55)**	(4.97)**	(5.78)**	(3.68)**
ln GDP p.c.	-0.307	-0.559	-0.096	-0.303
	(8.57)**	(1.70)	(4.14)**	(0.69)
Calorie supply	-0.238	-1.624	-0.230	-1.923
	(3.79)**	(3.19)**	(5.09)**	(2.90)**
Food self-sufficiency	-0.170	-1.426	-0.231	-1.670
	(2.46)*	(3.21)**	(4.52)**	(2.78)**
# Refugees	-0.000	0.001	0.001	0.006
	(0.11)	(0.43)	(2.02)*	(1.66)
US military aid	-0.005	-0.045	-0.003	-0.119
	(0.69)	(0.51)	(0.52)	(1.34)
Share Food exports	2.725	-2.015	0.740	-12.636
	(1.86)	(0.25)	(0.70)	(1.26)
Colony	-0.000	-0.022	0.000	-0.004
	(0.30)	(3.00)**	(0.93)	(0.49)
UN vote-similarity	-0.349	1.004	-0.326	2.881
	(2.32)*	(0.88)	(3.14)**	(1.97)*
Distance	-0.210	-1.999	-0.186	-1.395
	(5.81)**	(4.93)**	(7.23)**	(3.11)**
% Protestant/Catholic	0.003	0.007	-0.000	-0.001
	(5.23)**	(1.39)	(0.65)	(0.11)
Pseudo R^2	.30		.22	
r^2 (predicted/actual)		.23		.18
Observations	1337	616	1337	322
Countries	141	106	141	79

Note: Absolute z-values in parentheses. Coefficients of constant and year specific dummies not reported. The goodness of fit measure for the 2nd stage estimation is the squared correlation coefficient between predicted and actual levels of food aid.

* statistically significant at 95% level ** at 99% level

TABLE 4. WFP FOOD AID ALLOCATION.

	Total		Emergency	
	1st stage	2nd stage	1st stage	2nd stage
	(Probit)	(GEE)	(Probit)	(GEE)
ln Population	0.070	0.497	0.056	0.479
	(5.37)**	(5.76)**	(4.13)**	(2.79)**
ln GDP p.c.	-0.308	-0.596	-0.156	-0.473
	(9.91)**	(2.49)*	(5.15)**	(1.36)
Calorie supply	-0.161	-0.102	-0.302	-0.426
	(3.27)**	(0.35)	(5.07)**	(0.95)
Food self-sufficiency	-0.202	-0.868	-0.056	-1.730
	(3.57)**	(2.18)*	(0.97)	(3.41)**
# Refugees	0.013	0.008	0.008	0.012
	(4.86)**	(3.43)**	(4.92)**	(3.20)**
US military aid	0.006	-0.022	-0.004	-0.054
	(1.42)	(0.80)	(0.57)	(1.38)
Share Food exports	-0.316	-2.752	2.712	-3.662
	(0.21)	(0.15)	(1.32)	(0.20)
Colony	0.001	0.005	0.000	-0.001
	(1.53)	(1.35)	(0.62)	(0.16)
UN vote-similarity	-0.319	0.940	-0.262	1.703
	(3.65)**	(1.49)	(2.58)**	(1.96)*
Distance	-0.113	-0.026	-0.031	0.269
	(4.53)**	(0.08)	(1.06)	(0.54)
% Protestant/Catholic	0.001	-0.000	-0.002	-0.004
	(3.09)**	(0.15)	(3.73)**	(1.05)
Pseudo R^2	.41		.31	
r^2 (predicted/actual)		.32		.18
Observations	1330	822	1330	471
Countries	141	105	141	90

Note: Absolute z-values in parentheses. Coefficients of constant and year specific dummies not reported. The goodness of fit measure for the 2nd stage estimation is the squared correlation coefficient between predicted and actual levels of food aid.

* statistically significant at 95% level ** at 99% level

TABLE 5. NGO FOOD AID ALLOCATION.

	Total		Emergency	
	1st stage	2nd stage	1st stage	2nd stage
	(Probit)	(GEE)	(Probit)	(GEE)
ln Population	0.046	0.056	0.035	0.056
	(5.57)**	(0.49)	(4.89)**	(0.48)
ln GDP p.c.	-0.019	-0.580	-0.014	-0.569
	(0.95)	(1.46)	(0.81)	(1.36)
Calorie supply	-0.310	-0.640	-0.251	-0.161
	(7.65)**	(1.09)	(6.81)**	(0.28)
Food self-sufficiency	-0.072	-1.120	-0.059	-0.602
	(1.82)	(1.80)	(1.67)	(1.06)
# Refugees	0.001	0.008	0.001	0.009
	(2.49)*	(3.70)**	(2.77)**	(3.79)**
US military aid	-0.002	0.055	-0.003	0.041
	(0.36)	(2.49)*	(0.48)	(2.25)*
Share Food exports	1.452	16.559	1.806	14.074
	(1.28)	(1.23)	(1.83)	(1.11)
Colony	0.000	0.005	0.000	0.006
	(0.28)	(0.57)	(0.45)	(0.71)
UN vote-similarity	0.127	-1.057	0.095	-1.126
	(2.05)*	(1.04)	(1.72)	(1.20)
Distance	-0.123	-0.719	-0.093	-0.519
	(6.34)**	(1.55)	(5.29)**	(1.10)
% Protestant/Catholic	-0.000	-0.001	-0.001	0.000
	(1.38)	(0.18)	(3.41)**	(0.03)
Pseudo R^2	.22		.22	
r^2 (predicted/actual)		.19		.18
Observations	1330	243	1330	206
Countries	141	68	141	64

Note: Absolute z-values in parentheses. Coefficients of constant and year specific dummies not reported. The goodness of fit measure for the 2nd stage estimation is the squared correlation coefficient between predicted and actual levels of food aid.

* statistically significant at 95% level ** at 99% level