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**Evaluating the 1996 EU food aid reform:
Did it really lead to better targeting?**

Sarah Maas

**Trinity College Dublin
maass@tcd.ie**

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Evaluating the 1996 EU food aid reform: Did it really lead to better targeting?

Sarah Maas

Trinity College Dublin

maass@tcd.ie

Abstract

The paper analyses the 1996 EU food aid reform and addresses the question of its impact on improving EU food aid allocation in terms of reaching those countries which are most vulnerable to food insecurity. Using a two-stage regression model the analysis finds that EU food aid in kind is increasingly targeted towards developing countries affected by food insecurity. Most importantly, characteristics such as low calorie supply and balance-of-payments difficulties gained in importance in EU food aid allocation during the recent years. However, even though progress is noticeable, the results suggest a lack of coordination between the EU and other food aid donors which exacerbates food aid variability and may lower aid effectiveness.

JEL-Codes: O13, Q18, Q19

Keywords: EU food aid, policy reform, political economy, two-stage model

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1 Introduction

Prior to 1996, the European Union's (EU) food aid allocation was primarily intended as a means to dispose agricultural surpluses, characterised by a poor responsiveness to actual recipients' needs. Facing strong international criticism, EU food aid policy was subject to major modifications in course of the adoption of the new food aid regulation in 1996. Under the new regulatory framework, EU food aid intends to support long-term reduction of poverty and food insecurity, thereby responding effectively and coherently to recipients' needs. This paper examines thus whether or not EU food aid actually succeeds in realizing these well-intended objectives. The paper proceeds as follows. The next section briefly reviews major modifications of EU food aid policy under the 1996 reform. Section 3 and 4 present the empirical model and the methodology used for estimation. The results are discussed in Section 5. Finally, the last section summarises the conclusions and major implications of the present study.

2 Review of the 1996 EU food aid reform

After the establishment of EU food aid in 1967, the EU rapidly advanced to the second largest bilateral food aid donor after the US. As it was strongly linked to the Common Agricultural Policy (CAP), EU food aid was primarily intended as a disposal mechanism of agricultural surpluses and therefore resulted in a supply-driven rather than demand-based policy (Barrett and Maxwell, 2005).¹ In the early 1990s however, the reduction of agricultural surpluses as a result of the CAP reforms and the strong criticism of the rich world's food aid systems led to a reform process of EU food aid policy which was finally completed in 1996. With the adoption of the Council Regulation 1292/96, EU project and program food aid² essentially moved towards a holistic approach with the major objective being "to overcome problems of temporary food shortages, to manage post-crisis situations for food recovery and finally to

¹ In fact, Council Regulation 67/120 explicitly forbids the purchase of cereals in third countries if the interventions stocks contain sufficient inventory for food aid deliveries.

² Emergency food aid was separated from non-emergency food aid by initiating the European Community Humanitarian Office (ECHO) in 1992.

address structural food security problems” (EC, 2004). The new regulation explicitly specifies several allocation criteria, according to which EU food aid is allocated in accordance to:

- the food situation and food shortages in the recipient country using human development and nutritional indicators;
- per-capita income and the existence of particularly poor population groups;
- social indicators of the population’s welfare;
- the recipient’s balance-of-payments situation;
- the economic and social impact and financial cost of the proposed operation;
- the existence of a long-term policy on food security in the recipient country (EC, 1996).

Altogether, the EU food aid policy – it is claimed – moved towards a demand-based approach more sensitive to recipients’ needs. In recognition that the causes of poverty are complex and to enhance coherence with European Commission’s (EC) development strategies, program and project food aid was integrated in the conceptual framework of an overall poverty reduction strategy (Young and Abbott, 2008).

3 Methodology – The two-stage model

In this paper food aid allocation is assumed to be a two-stage decision-making process. In the first step, those countries which are deemed eligible for food aid are selected among a pool of potential recipients (selection decision). In the second step, the amount of food provided to each previously selected recipient is determined (allocation decision) (Neumayer, 2005). Given the non-negative nature of the dependent variable and the fact that a large share (i.e. 66%) of the observations equals zero, the analysis of food aid data poses specific problems. That is, by simply applying Ordinary Least Squares (OLS) regardless of the censored dependent variable the analysis will yield biased estimates (Prinz, 1994). The appropriate approach to analyse this process is the two-stage model which separates the selection and the allocation decision by applying two different estimation methods.

In the first step the selection of a limited number of countries among all potential recipients is considered a yes-or-no-decision which is modelled by a binary choice approach, i.e. a Probit model. To illustrate the general panel framework of Probit estimation consider the following model

$$\begin{aligned}
(1) \quad & FA_{it}^* = x'_{it}\beta + \delta_i && i = 1, 2, \dots, N; t = 1, 2, \dots, T \\
& FA_{it} = 1 && \text{if } FA_{it}^* > 0 \\
& FA_{it} = 0 && \text{otherwise}
\end{aligned}$$

where the subscripts refer to country i at time t . The unobserved latent variable FA_{it}^* represents the difference between the marginal cost and the marginal benefit of food aid. For positive values of the latent variable – the marginal benefit exceeds marginal cost – the observed outcome FA_{it} equals one. That is to say, food aid is only provided if the marginal benefit outweighs the marginal cost. In contrast, if marginal cost of food aid is higher than the marginal benefit, i.e. for negative values of the latent variable, food aid equals zero (PRINZ, 1994).

For the subsequent allocation decision an OLS model is used. In order to allow for OLS estimation the dependent variable is transformed from an originally censored to a continuous variable by dropping all observations equal to zero. That is, the OLS model takes into account those countries that actually receive food aid. Unfortunately, using only the positive values of food aid may yield biased and inconsistent estimates as the non-random sample selection of the endogenous variable leads to a violation of basic assumptions of OLS (Cameron and Trivedi, 2006). By use of Monte Carlo simulations Manning *et al.* (1987), however, show that bias of OLS estimates is typically small in foreign aid applications.

Additionally, some remarks on the estimation procedure are warranted. Insufficient data availability for very poor, undemocratic countries and countries at war or civil strife could introduce sample selection bias. Therefore, the dataset was constructed with a view to maximizing the number of countries in the dataset rather than the number of years by choosing explanatory variables with respect to avoid systematic exclusion of countries (see also Neumayer, 2003).

In modelling food aid allocation the information available at the time of decision-making is relevant. In order to imitate the decision-making process, most non-constant explanatory variables, i.e. the recipients' per-capita income and population size, child mortality, the current account balance, corruption, and democracy, enter the regression lagged by one year. Also food aid contributions of other donors, calorie supply per capita, and the degree of self-sufficiency enter the model with one-year lag in order to avoid endogeneity bias (Neumayer, 2005).

The data cover the period 1993-2003 for 106 countries, so that panel data techniques are employed for estimation so as to account for individual heterogeneity across countries (Greene, 2008). More precisely, a random effects (RE) approach is considered as appropriate

because it allows estimating coefficients of time-constant variables. To test for the effects of the food aid reform the dataset is split into two periods (i.e. 1993-1997 and 1998-2003). The second period starts in 1998 as policy changes are not expected to be fully implemented until 1998. The significance of differences is tested using a Chow test of structural change.

Finally, a Breusch-Pagan test adjusted to the panel data context indicates the presence of heteroscedasticity. In order to obtain reliable inference, robust standard errors are calculated for the selection and allocation stage using General Estimation Equations (GEE) and Generalised Least Squares (GLS), respectively (Wooldridge, 2002).

4 Specification of the food aid model and data

In order to evaluate whether the 1996 food aid reform in fact led to a better targeting of most vulnerable and food insecure countries an empirical model including recipients' needs, good governance, and donors' interests is proposed. The general specification of the model to be estimated is

$$(2) \quad FA_{i,t} = f(GDP_{i,t}, POP_{i,t}, IMORT_{i,t}, CAL_{i,t}, SS_{i,t}, CAB_{i,t}, SHOCK_{i,t}, WAR_{i,t}, NATDIS_{i,t}, REFUGEE_{i,t}, EXP_{i,t}, DEM_{i,t}, DIST_i, LOME_i, COL_UK_i, COL_F_i, ODON_{i,t-1}, FA_{i,t-1}).$$

An overview of all abbreviations, definitions and data sources of the variables is given in Table 1 and will be explained in greater detail below.

4.1 Dependent variable

As already mentioned in Section 2, the present paper focuses on project and programme food aid which is specified as the delivery of food measured in tons, with cereals being expressed in grain equivalents. Food aid data are provided by the International Food Aid Information System of the World Food Programme (WFP/INTERFAIS). Besides in kind deliveries, food aid is also given as financial assistance tied to the purchase of food commodities. However, due to lack of data it is not possible to include this form of food aid in a comprehensive manner and is thus excluded from the analysis (see also Neumayer, 2005). This is a major limitation of the study as the share of food aid deliveries in kind declined from 89% of total EU food aid in 1993 to 39% in 2000 (EC 2001) and should be kept in mind when interpreting the results.

Table 1. List of variables and data sources

Variable	Definition	Data Source
FA	Food aid (tons, with cereals specified in grain equivalents, other commodities in actual quantities)	WFP/INTERFAIS
ODON	Food aid deliveries from other donors to the recipient (see above)	WFP/INTERFAIS
SS	Self-sufficiency in cereal production (%)	FAOSTAT (2008a,b)
CAL	Per-capita calorie supply per day	FAOSTAT (2008c)
SHOCK	Year-to-year change in calorie supply (%)	FAOSTAT (2008c), own calculations
GDP	GDP per capita in Purchasing Power Parity (PPP) ('000 international Dollar)	IMF (2008)
CAB	Current account balance (USD)	IMF (2008)
POP	Population (Mio)	World Bank (2008a)
IMORT	Infant mortality rate, under-5 (per 1,000)	UNDP (several years)
REFUGEEES	Number of refugees residing in the recipient country	UNHCR (2008)
CORR	Index of corruption in the recipient country (2.5 lowest level, -2.5 highest level of corruption)	World Bank (2008b)
DEM	Freedom of the population in the recipient country separated into free, partly free, and not free (proxy for democracy)	Freedom House (2008)
EXP	Share of bilateral cereal exports from the EU to the recipient country (%)	UN (2008)
DIST	Distance between Brussels and the capital of the recipient ('000 kilometers)	Haveman (1998), completed with the Geobytes (2008) database
COL_UK	Dummy variable for former colonies of the UK	Prinz (1994)
COL_F	Dummy variable for former colonies of France	Prinz (1994)
LOME	Dummy variable for member states of the Lomé Agreement	EC (2008)
CIS	Dummy variable for countries of Eastern Europe and the CIS	WFP/INTERFAIS

Note: Dummy variables equal one if the event takes place. *Source:* Author's own composition.

The accurate specification of the dependent variable is extensively discussed in the foreign aid literature (see for instance Neumayer, 2003). Essentially, aid allocation may be modelled in total or in per capita terms. However, McGillivray and Oczkowski (1991) point out that it is difficult to allocate food aid in per-capita terms since decision-makers have to be careful neither to exceed nor to fall short of a fixed budget. As such aid distribution per capita is an outcome of the aid allocation process rather than a primary consideration. Food aid allocation

is therefore specified in total terms while including the population size as a control variable. Moreover, to reduce the impact of outliers the dependent variable is defined as the logarithm of food aid deliveries which is an approach widely used in foreign aid literature (Dollar and Levin, 2006).³

4.2 *Explanatory variables*

The EC claims that EU food aid focuses on humanitarian objectives. To test for the responsiveness of EU food aid to recipients' needs several measures are considered in the upcoming analysis. More precisely, the EC's stated intentions outlined in Section 2 are captured by the per-capita income measured as Gross Domestic Product (GDP) per capita, the infant mortality rate as an indicator for non-economic well-being, the population size, the current account balance, the degree of self-sufficiency in cereal production, and the recipient's average calorie supply per capita. Unfortunately, data of the per-capita calorie supply obtained from the Food Balance Sheets of the Food and Agriculture Organisation of the UN (FAO) are only available until 2003, so that the estimation period has to be restricted to 1993-2003. Furthermore, to test whether the EU responds to sudden changes in food availability in recipient countries a shock variable calculated as the percentage change of calorie supply from one year to another and the number of refugees residing in the recipient country is included.

Good governance as a criterion for aid allocation is gaining in importance as multilateral aid donors, for instance the IMF and the World Bank, increasingly condition aid transfers on reforms ensuring good governance in the recipient country (World Bank, 1998). In order to test whether the EU is selective towards countries with sound policies the complex concept of good governance is captured by the degree of corruption and democracy. These variables serve as an indicator for the importance of human rights and the population's opportunities to participate in the political decision-making process. The level of corruption in the recipient country is measured by the World Bank's Worldwide Governance Indicators (KAUFMANN et al. 2003). Since these indicators are only collected intermittently since 1996 and on an annual basis since 2002 years with no data available are replaced by the latest available observation, making use of the reasonable assumption that the level of corruption does not vary considerably from year to year. Due to better data availability as compared to the Worldwide

³ The dependent variable is calculated as $\log(1+FA)$ to ensure that zero observations are not deleted by taking the logarithm.

Governance Indicators, data measuring the degree of democracy in the recipient country are obtained from Freedom House which classifies a country as free, partly free or not free with respect to political rights and civil liberties of the population.

Food aid donors are often accused to provide food aid with a view to commercial interests. Important trading partners or promising export markets are thus expected to receive a higher amount of food aid, measured by bilateral cereal exports from the EU to the recipient country as a share of total cereal exports of the EU.

Moreover, food aid may be used as an instrument to support particular regimes or systems. In the aftermath of the Cold War the EU donated large amounts of programme food aid to the Commonwealth of Independent States (CIS) which may have been intended to support the newly adopted economic system and to increase political stability in the region (Prinz, 1994). It is reasonable to argue that political and economic stability in the former Soviet Union was particularly important to the EU since potential migrants of these countries are prone to be attracted by EU countries due to its wealth and geographical proximity, which is captured by a dummy variable for Eastern Europe and the CIS.

The EU may also intend to assure their traditional external influence by favourable treatment of specific countries. These may include former colonies or member states of the Lomé agreement which are captured by dummy variables for former colonies of the United Kingdom (UK) and France and Lomé membership (Neumayer, 2005).

In order to explore whether EU food aid responds to other donors' food aid contributions, food aid donations of other donors enter the model. Finally, in the foreign aid literature it is commonly argued that aid allocation is based on last year's budget with only a narrow range of increases and decreases from one year to another. Following, *inter alia*, Prinz (1994) and Barrett and Heisey (2002) the hypothesis of incremental budgeting is tested by introducing the lagged value of food aid in the model.

5 Results and discussion

The analysis shows that the policy reform indeed led to considerable changes in EU food aid allocation as the null hypothesis of no structural change (Chow test) is rejected at the 0.1% significance level. Detailed results of the analysis, presented in Table 2, are discussed in the following. Most importantly, the estimation results indicate that the reform led to a stronger focus on the recipients' food situation. That is, while the calorie supply did not systematically affect food aid allocation in the period 1993-1997, it has a highly significant negative impact in the second period. Also the results for the current account balance clearly suggest that food

aid allocation improved in recent years. In the period 1993-1997 countries with a higher current account balance were more likely to be eligible for food aid than countries with a poor balance-of-payments situation. This result is inconsistent with humanitarian objectives as countries with a poor current account balance have a low ability to mitigate shortfalls in food availability by imports. After the 1996 reform however, countries with a poor current account balance receive more food aid than countries with a more comfortable balance-of-payments situation both at the selection and the allocation stage. Overall, the evidence suggests that food aid allocation moved from a rather supply-oriented policy to a policy highly responsive to the recipients' financial and nutritional status.

The results further show that neither the number of refugees nor sudden shocks in food availability affect the allocation of project and programme food aid which may be addressed by emergency food aid, suggesting an efficient coordination of EU emergency and non-emergency food aid.

Interestingly, the analysis shows that the recipient's per-capita income had a negative impact on food aid allocation in 1993-1998 but does not influence EU food aid allocation in the post-reform period. That is, EU food aid is primarily targeted towards food insecure countries (recall the significant negative coefficient of CAL) rather than towards poor countries in general which may be addressed by other types of development assistance more appropriate to alleviate poverty. Moreover, the results verify the hypothesis of population bias at the selection stage for the period 1998-2003, which is inconsistent with theory as "there is no reason to presume that less populous countries are any less in need of food aid than more populous ones" (Neumayer, 2005).

As EU self-interest is concerned the results show EU cereal exports to the recipient do not affect the allocation of project and programme food aid following the food aid reform, whereas commercial interests determined food aid allocation prior to the 1996 reform. Moreover, the EU seems to fail in consistently rewarding good governance in the recipient country. First, the degree of democracy does not affect EU food aid allocation, neither at the selection nor the allocation stage. Second, evidence indicates that the importance of the recipients' degree of corruption is diminishing. Less corrupt developing countries received a larger amount of food aid at the allocation stage than countries with higher levels of corruption in 1993-1998, whereas corruption was no concern for food aid allocation in the

period 1998-2003 anymore.⁴ This most likely leads to efficiency losses of programme food aid and contrasts the intention to reward countries for sound policies and institutions.

Table 2: Estimation results for EU food aid allocation

Explanatory variable	GEE model (Selection decision)		GLS model (Allocation decision)	
	1993-1997	1998-2003	1993-1997	1998-2003
Constant	.250 (.906)	.741 (1.194)	7.552*** (1.237)	3.421 (2.587)
ln food aid (t-1)	.305*** (.057)	.448** (.147)	.500*** (.079)	.318* (.159)
ln GDP per capita (t-1)	-.556** (.188)	-.093 (.288)	-.504 (.315)	-.005 (1.004)
ln population size (t-1)	-.058 (.089)	.366*** (.113)	.299* (.114)	.330 (.327)
Infant mortality (t-1)	.003 (.002)	.003 (.003)	.003 (.002)	-.004 (.007)
Self-sufficiency (t-1)	-.826* (.330)	.110 (.438)	-.288 (.430)	.387 (1.216)
Calorie supply (t-1)	-.000 (.000)	-.002*** (.000)	-.000 (.000)	-.000 (.001)
Shock	.009 (.012)	.020 (.030)	.045 (.023)	.045 (.074)
Current account balance (t-1)	.042* (.019)	-.032* (.016)	.088 (.061)	-.127*** (.036)
ln number of refugees	.018 (.050)	-.125 (.064)	-.134* (.068)	-.064 (.138)
Bilateral cereal exports	.455* (.186)	.582 (.330)	.150 (.364)	2.381 (1.308)
Democracy (t-1)	.319* (.140)	-.025 (.131)	-.388* (.182)	.033 (.405)
Corruption (t-1)	-.100 (.233)	.343 (.227)	.525* (.243)	-.280 (.577)
ln other donor's food aid (t-1)	.090*** (.025)	.106*** (.025)	.127* (.054)	.149 (.117)
Lomé membership	-.006 (.267)	.178 (.296)	-.564 (.338)	1.462 (.785)
Former colony of UK	-.355 (.256)	-.006 (.261)	-.155 (.291)	.269 (.968)
Former colony of France	-.207 (.277)	.305 (.270)	-.632* (.306)	.085 (.802)

⁴ Note that the reverse interpretation of this variable which is defined from -2.5 to 2.5 with the lowest value corresponding to the highest degree and 2.5 to the lowest degree of corruption.

Eastern Europe and CIS countries	-1.228*** (.311)	.784* (.386)	2.182*** (.505)	2.562* (1.146)
Chow (F) test	185.79***		51.21***	
Wald test	149.54***	96.24***	323.52***	65.00***
Pr(Y>0)	.534	.187		
Pr(Y*>0)	.536	.185		
E(ln Y)			8.067	8.025
E(ln Y*)			8.074	8.047
Observations	530	636	283	119
Countries	106	106	84	39

Values in parenthesis are robust standard errors of the regression coefficients, *** (**, *) statistically significant at the 99.9% (99%, 95%) level. Pr = Probability, E = expected value, Y* = predicted value, Y = observed value, further abbreviations are explained in Table 1. *Source:* Own calculations.

The results for the CIS countries suggest that food aid delivered towards Eastern Europe and the CIS gained in importance following the food aid reform. While Eastern European countries were less likely to be eligible for food aid, this is not the case for the period 1998-2003. Instead, food aid deliveries are biased towards the CIS both at the selection and the allocation stage, thereby indicating that EU food aid is biased towards neighbouring countries. Finally, the analysis provides evidence that the amount of other donors' project and program food aid positively affects the amount of food aid the EU provides to a particular recipient. Instead of pursuing an effective coordination of food aid contributions among donors (which would imply a negative coefficient), the evidence suggests that EU food aid allocation might thus be influenced by peer pressure. Unfortunately, the lack of coordination among donors exacerbates food aid variability and is likely to reduce aid effectiveness. However, the results indicate that the importance of peer pressure in food aid allocation declined following the policy reform (allocation stage). But as food aid allocation continues to be influenced by other donors' food aid contributions at the eligibility stage, there is still scope for further improvement towards a better co-ordination among donors.

6 Summary and major conclusions

This paper empirically investigated the 1996 reform of EU food aid policy using a two-stage model. In order to examine whether the reform has led to a significant improvement of EU food aid in targeting recipients' needs, an ex-ante and ex-post examination of food aid allocation is performed. In general, the analysis provides evidence that EU food aid in kind today is to a larger extent allocated with a view to the nutritional status of the recipient

country. That is, EU food aid increasingly addresses countries with a low per-capita calorie supply and a poor current account balance. Contrarily, the recipients' income per capita does not affect the allocation of food aid in kind any longer suggesting that poor countries in general are targeted by other instruments of development assistance more appropriate to alleviate poverty. Despite the positive developments, there is still room for future improvement of EU food aid allocation. More precisely, EU food aid in kind is likely to suffer from efficiency losses as it does not consistently address less corrupt governments and is also positively associated with other donors' food aid contributions which exacerbates food aid variability and reduces food aid effectiveness.

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