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GRAVITY, GOOD GOVERNANCE, POLITICAL AFFINITY, ECONOMIC INTERESTS AND FOOD AID: DO CATEGORIES AND DELIVERY MODES MATTER?

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RÉSUMÉ

Puisque les programmes d'aide alimentaire peuvent atténuer les conséquences malheureuses des pénuries alimentaires survenant dans certains pays, leur importance est capitale. Mais, quelles sont les facteurs conditionnant le volume d'aide alimentaire envoyé aux pays potentiellement receveurs ? Cette étude novatrice répondra à ces questions en appliquant le modèle gravitationnel, habituellement utilisé pour expliquer le commerce international, au schème de distribution de l'aide alimentaire internationale. En effet, en considérant les 15 plus gros programmes nationaux de dons alimentaires, cette étude teste l'impact de la distance entre les donateurs et les receveurs ainsi que celui de la population de ces derniers sur la décision d'envoyer ou non de l'aide alimentaire. De plus, ce mémoire exposera de nouvelles hypothèses jusqu'à présent omises par la littérature et proposera une méthodologie plus efficace pour étudier le phénomène. Entre autres, nous trouvons que la gravité, la bonne gouvernance, les besoins, les affinités politiques et les intérêts économiques influencent l'élaboration du schème de distribution de l'aide alimentaire, mais que leur influence varie selon la catégorie et le moyen de livraison de l'aide alimentaire. De plus, nous trouvons que lorsque les donneurs donnent de la nourriture de leur propre production, ils prennent moins en compte le fait qu'ils aident un pays ami ou un pays économiquement fermé puisqu'ils aident leur propre économie.

ABSTRACT

Since food aid can mitigate the unfortunate consequences of food shortages in certain countries, the importance of such programs is crucial. However, what are the factors conditioning the volume of food aid sent to potential recipient countries? This innovative study will answer this question by applying the gravity model, often used to explain international trade patterns in distribution of international food aid. Indeed, in considering the 15 largest national programs of food donations, this study will test the impact of the distance between donators and receivers, as well as the impact of the populations of each, on the decision to send or not to send food aid. In addition, this thesis will outline new hypotheses that have been hitherto omitted from the literature, and will propose a more efficient methodology to study the phenomenon. Among others we find that gravity, good governance, needs, political affinity and economic interests matter in the food aid distribution patterns but that their influence vary across food aid categories and delivery modes. We also find that when donors give food from their own production they are less fussy about whether they are helping a friendly country or an economically closed country because in fact they are helping their own economy.

AVANT-PROPOS

Ce mémoire n'aurait jamais pu voir le jour sans la contribution et les encouragements de nombreuses personnes au cours de mes études à l'Université Laval. En premier lieu, je remercie mes directeurs de recherche Érick Duchesne et Bruno Larue. Grâce à eux, j'ai eu l'opportunité de pousser mes recherches beaucoup plus loin que je ne l'aurais pensé au départ. Leurs encouragements, corrections et commentaires ont grandement contribué à faire de moi un meilleur chercheur. De plus, la possibilité de travailler avec eux a certainement été déterminante dans l'élaboration de ce mémoire. Aussi, je tiens à remercier les professeurs Anessa Kimball et Patrick Leblond, qui ont tous deux commenté des versions antérieures de ce projet, et Rodwan Abouharb, pour avoir accepté d'agir à titre d'évaluateur externe. Je tiens également à remercier ma tante Ginette Langlois qui a patiemment corrigé mon anglais, et ce dans plusieurs versions de ce mémoire. Pour m'avoir permis de présenter mes résultats de recherche dans le cadre de conférences, je tiens à remercier le Centre de recherche en économie agroalimentaire (CREA), le Département de science politique de l'Université Laval, le Centre d'études en politiques internationales de l'Université d'Ottawa (CÉPI) et le Canadian agricultural trade policy and competitiveness research network (CATPRN). De plus je me dois de remercier l'Institut québécois des hautes études internationales pour une maîtrise plus que stimulante. D'une façon plus générale, je suis à jamais reconnaissant envers mes parents qui m'ont toujours encouragé à poursuivre mes passions. Leur soutien inconditionnel est en grande partie responsable de mon épanouissement personnel. Finalement, je veux remercier ma famille: Catherine, Maxime, Max; mon amoureuse Rosalie et mes amis pour m'avoir encouragé tout au long de mes études.

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CHAPTER 1: INTRODUCTION

In his 1976 paper *"Scarce Goods as Political Weapons: The Case of Food"*, Peter Wallenstein describes how food can become a political weapon for the largest producing countries. Due to factors like scarcity, supply concentration, demand dispersion and the sellers' liberty of action, food may be used to serve political interests. In the case of food aid, it can be argued that donor countries may use their aid allocation to strengthen their own interests (i.e., aid for trade).

According to the *Food and Agriculture Organization* (FAO), the average price of staple food commodities increased by 48 percent, in real terms, from 2006 to 2008 (FAO, 2009). Given that staples contribute between 40-80% of energy intake in poor countries, even small price increases can have significant effects on the well-being of large populations. With the current global food crisis, it has become ever more important to gain a better understanding of the factors conditioning world food security. Food shortages and the resulting soaring prices are often slow to correct thus magnifying the dreadful consequences of hunger and famine in many countries. International food aid programs can mitigate such situations as long as the donor's own interests are aligned with the interests of the targeted countries.

Food aid has existed for many centuries under different forms. However, the first ever recorded official grant of food to a foreign country was from the United States to Venezuela in 1812, in response to an earthquake (Singer et al, 1987). Up until the 1918

Armistice, food aid had only been used for emergency situations. The first food aid program appeared during the reconstruction phase of 1919-1926, when a total of 6.23 million tons of food were shipped from the United States to Europe. Nevertheless, it is suspected that it was the donor's intent to reduce agricultural surplus that motivated the first official food aid program (Cathie, 1982). In the late 1930s, increases in acreage and weather shocks led to large surpluses of agricultural commodities in the United States. With the objective of protecting the income of American farmers, the government chose to destroy food produced in excess. During the Second World War, American farmers increased their production capacities in order to respond to the Allies' demand. When the same state of overproduction occurred in the 1950s, destroying surpluses was no longer morally nor politically acceptable. Inspired by the Marshall Plan that gave food grants, some policy makers saw in food aid the solution to long-term surpluses (Cathie, 1982). In 1951, Canada implemented the Colombo plan, which featured the first contemporary food aid program. On July 10th of 1954, the United States followed Canada with the enactment of Public Law 480, also known as the «Food for Peace» program, which was the largest food aid program at the time (Barrett and Maxwell, 2005). It took 14 more years for the European Community to begin its own food aid policy as «a concession to complaints from the USA that it unfairly had to bear all the burden of food aid donations» (Cathie, p. 25, 1982). At this time, the rate of growth of US agricultural trade was slowing and therefore US policymakers found that the benefit of a larger food aid program was supplanted by the cost associated with it (Cathie, 1997). Thus the United States asked for a participation of the European Community in the food aid regime.

In the 1960s, food aid became a more common practice; by then 11 countries and the European Economic Community had signed the Food Aid Convention (FAC) in 1967. According to the Australian Department of External Affairs (1968), the FAC aims « to carry out a food aid program with the help of contributions for the benefit of developing countries». One of the major concerns of the FAC is to regulate the motives that underlie the aid allocation. Those worries are found in articles #2 and #7, which stipulate that donors' actions should be conditioned by the recipient's needs and not donors' interests. There are however elements in several donor programs that suggest that this is not always the case.

There are legitimate concerns about what really motivates the distribution patterns of international food aid programs. These motivate our research question addressed in our analysis is the following:

- *What are the factors conditioning the volume of food aid sent to potential recipient countries?*

Literature on food aid can be categorized into three main trends. The vast majority of studies look at distribution patterns of food aid among recipient countries (Ball and Johnson, 1996; Barrett and Heisey, 2002; Diven, 2006; Neumayer, 2005; Eggleston, 1987). Other studies have focused on the efficiency of food aid (Barrett and Heisey, 2002, Mohapatra et al, 1997) and a third category has investigated the link between the aid supply of a donor and its domestic agricultural surplus (Webb, 2000; Gilbert, 1996; Diven, 2001; Barrett, 1998). Our study clearly belongs to the first category. Indeed, this thesis will not

try to understand what motivates the absolute level of food aid, but its distribution among possible recipient countries.

Since the innovative work of McKinlay and Little in 1977, in which they define the modern typology of determinants of aid programs, donor interests and recipient needs, many authors have contributed to this large body of research. However, most of those analyses focus on American programs. Even if food aid from the United States accounts for approximately 57% of all food aid, there are other countries that play a major role in supplying food aid. Indeed, relatively small programs had in the past a considerable impact on the international food aid regime (Clay, 1985). One of the key features of our analysis is that it includes all the major food aid donors. More precisely, it includes every donor who participated in at least 1% of the food aid flows during any of the years included in the period analyzed (1988-2002). Also, the majority of those previous researches consider food aid as a whole, but as we will subsequently show, it is possible to gain a really better understanding of food aid practice by breaking down the data into different aggregations. Thus we will also innovate by assessing the impact of the different categories and delivery modes on food aid allocation patterns.

The development of empirical models explaining aid patterns, food aid or official development aid has generated a large debate in the scientific community. Most studies consider the distribution patterns of a single donor to various recipient countries with different econometric methods: Ordinary Least Squares (OLS), Tobit and Multiple Equation Models. This paper innovates by adapting the popular Gravity Equation used to model bilateral trade flows (e.g., McCallum, 1995; Anderson and van Wincoop, 2003;

Helpman, Melitz and Rubinstein, 2008) to explain food aid flows. In doing so, we will also address the high proportion of zero flows and possible heteroskedasticity by relying on a random-effects negative binomial regression model as suggested by Silva Santos and Tenreyro (2006). As argued in more details later, the basic propositions of the Gravity Equation still apply: food aid from donor countries to recipient countries is positively related to their respective size and negatively related to the distance between them. Larger donors will tend to give more and larger recipients will tend to receive more of this aid.

Table 1.1 Total Food Aid Flows by donor (1988-2002)

- The United States of America (57%)
- The European Community (16.4%)
- Canada (5.5%)
- Japan (4.7%)
- Germany (2.3%)
- Australia (2.2%)
- France (1.8%)
- The United Kingdom (1.3%)
- Italy (1.3%)
- The Netherlands (1.2%)
- China (1%)
- Sweden (1%)
- The Republic of Korea (0.7%)
- Denmark (0.6%)
- Norway (0.5%)
- The Russian Federation (0.3%)
- Others (2.3%)
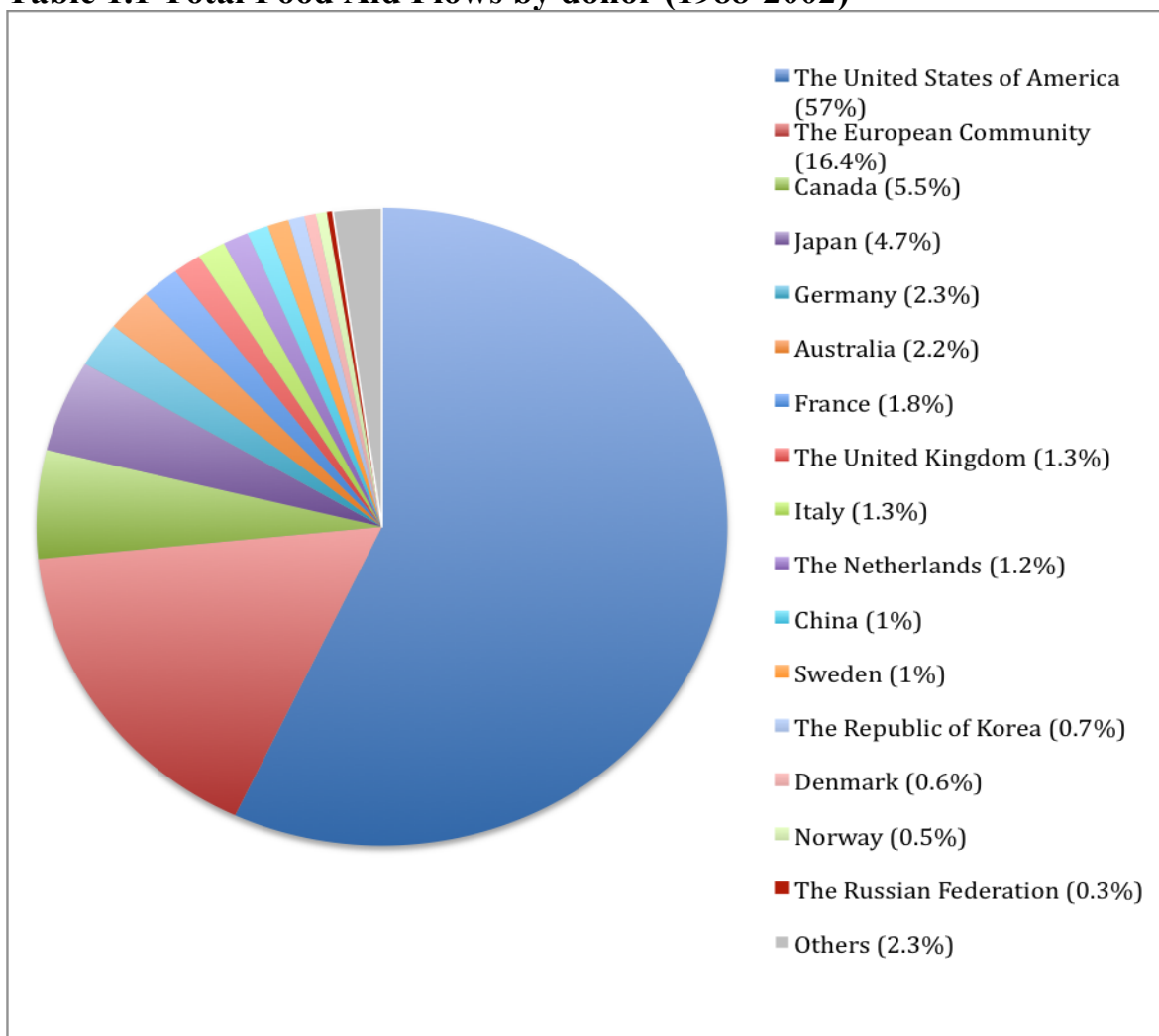
During the Cold War, hypotheses concerning political interests of donors such as military alliances or political ties were tested and found significant (Ball and Johnson, 1996; Eggleston, 1987; Zahariadis et Al, 2000; Shapouri and Missiaen, 1990). In the 1990s, some authors (e.g., Neumayer, 2005; Zahariadis et al, 2000) suggested that the relative importance of military concerns from donor countries should decrease in favor of economic ones. In several instances hypotheses about economic interests were not tested, but when tested, they were often insignificant. On the other hand, authors like Young and Abbott (2008) who analyzed the 1990-2000 period found that recipient needs had become increasingly more important in explaining the patterns of food aid distribution. Political ties and geographic regions were found significant in some studies (e.g., Neumayer, 2005; Zahariadis et al, 2000). Furthermore, the end of the Cold War has induced a shift of interest from national security to ideological values (e.g., Meernick et al, 1998; Allison and Beschel, 1992; Clad and Stone 1993; Deibel, 1992; Diamond, 1992; Gaddis, 1992; Jervis, 1991; Kegley, 1993). And finally, the respect for democratic norms by the recipient country has been tested in two different studies with contradictory results (Zahariadis et al, 2000; Fariss, 2007).

Relying on the typology of McKinlay and Little (1977), it is possible to classify the determinants of food aid allocation into four categories: political donor interests, economic donor interests, recipient needs and good governance. Thus, donor interests are split into two distinct categories. Appendix I shows an overview of multivariate regression studies on the determinants of food aid allocation with the above classification for their independent variables. Most studies include variables from some categories, but not all. In fact, only the study done by Zahariadis et Al (2000), for the 1978-1990 period, includes explanatory

variables from all four categories. Determinants from all four categories may matter in explaining food aid patterns, as we shall show subsequently. Thus, the omission of variables from one category could result in a biased estimation of the impact of other variables. Clearly, one of our key contributions is to include variables from all categories in our model specification.   Another contribution is the test of new hypotheses. More specifically, the food aid literature, unlike its counterpart about official development aid, has never included any aspect of good governance other than the respect for democratic norms. In this paper good governance will be analyzed more thoroughly along with economic factors, which have often been neglected in previous studies. First, the importance of economic interdependence between donors and recipients will be ascertained along with the economic openness of the recipient. In short, our analysis will extend the debate on the economic and political determinants of food aid in several directions.

The remainder of this thesis is structured as follows. In the next section, the definition of our key concept, food aid, and the theoretical framework regarding the allocation patterns of food aid are presented. The estimation strategy is described in the third section just before chapter four where we discuss our results. In chapter five, we deepen the discussion on food aid by analyzing changes between food aid allocation patterns in the period 1988-1995 and 1996-2002, testing different governance indicators and by assessing if different donors imply different food aid distribution patterns? Then we conclude with a brief summary of our results, their policy implications, a discussion of the limits   of   our   study   and   of   future   research   endeavor.

CHAPTER 2: THEORETICAL FRAMEWORK

This chapter presents definitions of food aid, its different categories and delivery modes. Subsequently we justify our choice of using a gravity framework to explain food aid allocation patterns and elaborate our theories and hypotheses about food aid distribution patterns. We base our theoretical framework on diverse sources, such as previous gravity model and food aid studies, the Interdependence theory of Keohane and Nye (1977) and the liberal theory of international politics of Moravcsik (1997). We also bring some new arguments to explain food aid practice. Let us start by defining food aid.

Definitions

Food Aid

Even though food aid no longer represents a high proportion of international aid (2%), the aid literature has always distinguished it from all other types of development aid for many reasons. It has mainly been studied separately because of the very special link that it has with international agricultural trade and the basic need to feed ourselves (Barrett and Maxwell, 2005). However, the concept of food aid itself is often misunderstood. Food aid is often viewed as a donation of food to starving people gathered in refugee camps during a famine, but this accounts for only a small part of it. Food aid also includes international food sales on concessional terms. Barrett and Maxwell (p.5, 2005) discern «three core characteristics that distinguish food aid from other forms of assistance: the international

sourcing of concessional resources in the form of or for the provision of food». Therefore all food aid share three basic characteristics 1) it comes from an international source, 2) it is in form of food or money for provision of it, 3) and it is given or sold under favorable conditions for the benefit of the recipient country. Until now, the literature on food aid has mainly considered food aid as a whole or only distinguished between emergency food aid and other categories taken jointly (Ball and Johnson, 1996; Zahariadis et al, 2000; Hermann et al, 1992; Shapouri and Missiaen, 1990; Barrett and Heisey, 2002 Neumayer, 2005; Young and Abbott, 2008). In this paper, we argue that by breaking down food aid into its different categories and delivery modes we gain a better understanding of diverse food aid donors' practices and avoid misinterpretation of some results. Indeed, our results clearly show that by only considering food aid as a whole we may misinterpret the influence of some food aid allocation determinants. Therefore, we present the different food aid' categories and delivery modes in the next sections.

Food Aid Categories

We first present the different categories of food aid. The *World Food Programme* discerns three categories of food aid: emergency food aid, project food aid and program food aid. In this study we will use these categories for two reasons. First, each category is used in different contexts and aim at different goals. Secondly and more practically, these data are available for all major donors of food aid.

Emergency food aid is provided to victims of natural or man-made disasters on a short-term basis. It is freely distributed to targeted beneficiary groups. Usually provided as a grant, it is channeled multilaterally through NGOs or bilaterally (WFP, 2009). The share of emergency aid in all food aid gradually increased from 15.6 % in 1988 to 46.1% in 2002. According to Young and Abbott (2008) emergency food aid increases because « in the 1990s there was a dramatic increase in the number of protracted complex emergencies» (p.31). Indeed, global warming and political conflicts in the 1990s have increased the number of disasters in which humanitarian aid is needed. Thus more humanitarian aid was needed.

Programme food aid is sold on the open market and can be provided either as a grant or as a loan. It is provided on a government-to-government basis for balance of payments or budgetary support. This category of aid is not targeted at specific beneficiary groups (WFP, 2009). The share of program food aid decreases progressively from 57,7% at the beginning of the studied period to 25,2% at the end.

Project food aid is provided to support diverse types of projects for poverty reduction and disaster prevention activities. It is usually given as a grant and freely distributed to target beneficiary groups, but it may also be sold on the open market, and is then referred to as monetized food aid. During the whole studied period, the share of project food aid has stayed stable at approximately 25%.

Table 2.1 Food Aid Flows by Category
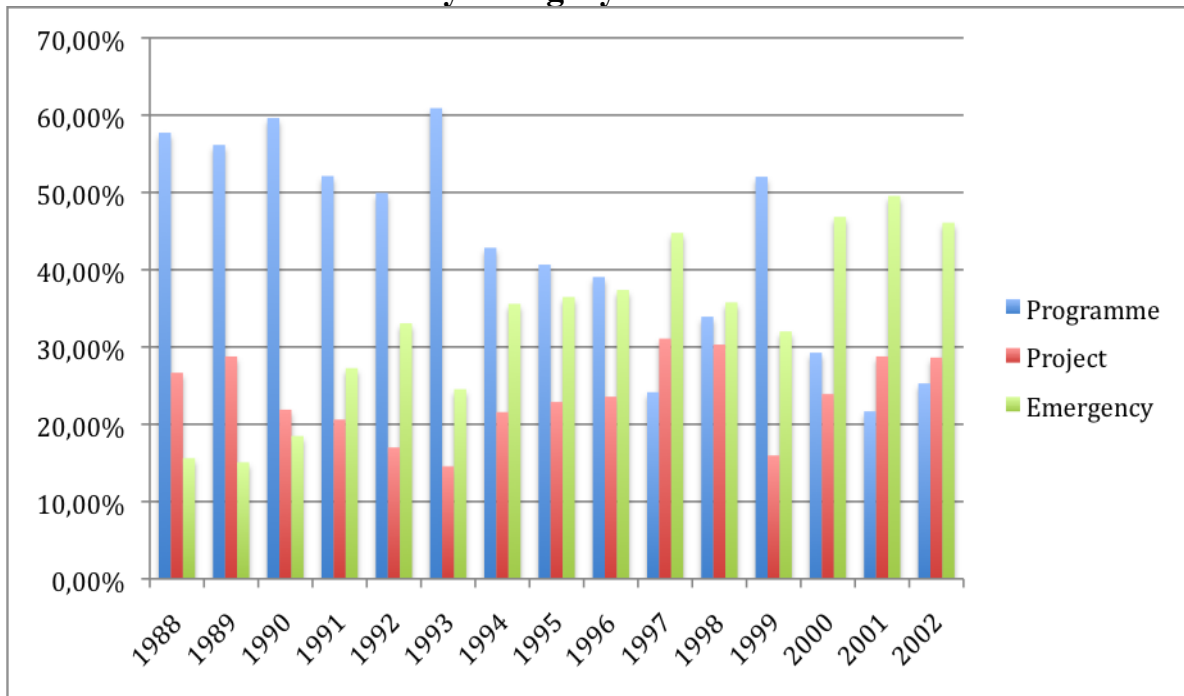
As noted by the Canadian International Development Agency (2006), programme and project food aid aim «to transfer income to the poor and/or to satisfy their minimum nutritional needs». Thus for these categories, donors do not only aim at food security. This may have a huge impact on its allocations decisions. As we will explain later in this paper, some studies already analyze emergency food aid separately from the two other categories. However, no paper on food aid distributional patterns look at the difference between project and programme. Since many differences exist between project and programme food aid we will investigate these two categories individually. We give more details on this disaggregation in chapter four.

Food Aid by Delivery Modes

There are three different ways for a donor to deliver food aid commodities to the recipient country: direct transfer, triangular purchases and local purchases. Each delivery mode has advantages and disadvantages for both donor and recipient. These advantages are certainly considered by donors in the elaboration of their food aid distribution patterns. Therefore, different delivery modes may induce different allocation patterns.

When direct transfer delivers food aid, it means that the aid is sent directly from the donor to the recipient. The proportion of food aid sent with this delivery mode has progressively decreased from 90% in 1988 to 81% in 2002. Furthermore, some food aid laws or regulations (Canada and United States) obligate that a high percentage of food aid comes from its own production. When policy maker are not legally bound to buy a percentage of food aid from their national producer, administrative decisions generally give a huge advantage to national supplier (Clay, 2006). Thus, direct transfer food aid is often considered as tied aid because it comes from donors' national production and mostly benefits national actor from the donor (Clay, 2006).

Table 2.2 Food Aid Flows by Delivery Modes
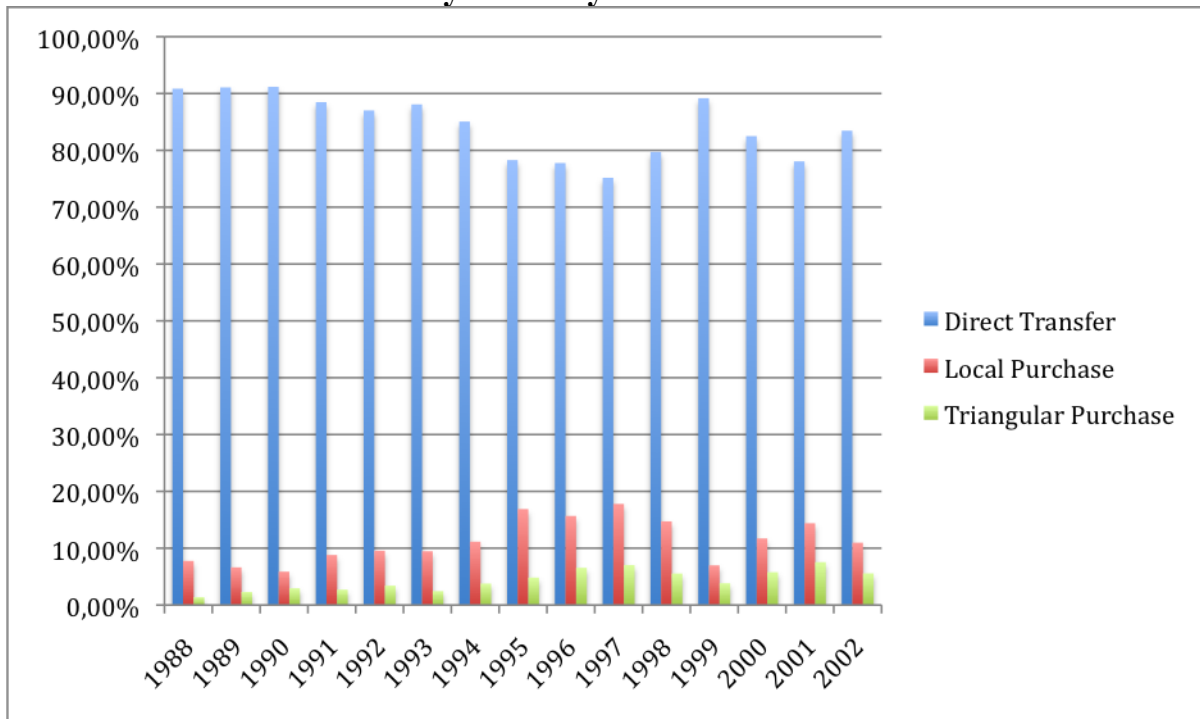
Triangular purchases represent a «transaction by which a donor provides commodities purchased in a third country as food aid to a final recipient country» (WFP, 2009). This type of food aid aims to increase food trades between developing countries (Cathie, 1997). Local purchases are « transactions by which food aid is purchased and distributed in the recipient country» (WFP, 2009). Obviously, using local purchase food aid requires a certain level of food availability and development in the recipient countries. This will sure be represented in the allocation patterns of donors. Food aid sent by triangular transaction and local purchases respectively increased from 7% to 10% and 1% to 6% between 1988 and 2002.

As we said no previous study on food aid ever assesses if the influence of the factor conditioning the volume of food aid sent to potential recipient countries vary across food aid delivery modes. In this section we underlined the differences between each delivery mode. By doing so we find justifications of assessing if the different delivery modes imply different allocation patterns. Now that we have defined food aid, its different categories and delivery modes, we will explain our theoretical choices and elaborate a theory on food aid allocation patterns.

A Gravity Framework

As noticed in chapter one, this research applies a gravity model to food aid allocation patterns. Until now, gravity models have been used mainly to understand international trades flows (e.g., McCallum, 1995; Anderson and van Wincoop, 2003; Helpman, Melitz and Rubinstein, 2008). We adapt this model to food aid distribution patterns for different reasons. Mainly, we suspect that in many situations food aid is considered as a commercial commodity. To begin with, some concessional sales of food are considered like food aid. It is easy to predict that the proportion of food aid sold by the donors may be motivated by the same incentives than trade. Thus, in such situation, food aid is a commercial good. Furthermore, some authors argue that the major beneficiaries of food aid delivered by direct transfer, that account for approximately 85% of all food aid during the period analyzed, are donor's national companies (Barrett and Maxwell, 2005; Cardwell, Fridfinnson and Rude, 2007). Since this form of aid comes from the national food production and food aid is still largely link to agricultural surplus, agribusinesses gain

a lot from food aid; it raises prices of agricultural goods and allows them to produce more. Also, transport and logistic businesses benefit greatly from the delivery and logistic contracts related to food aid. Finally, the United States of America, Germany and France admitted in a recent past using food aid to promote their trade of agriculture goods (Cathie, 1997). Thus food aid may be a commercial product in some situations and therefore determinants of commercial trade may also apply to food aid. Furthermore, we also rely on some liberal theories to explain food aid distribution patterns. Therefore, before presenting our five sets of hypotheses, in the next section we will do a brief presentation of the major assumptions that most of liberal theories share.

Liberal Theory

Although liberalism is more a perspective than a theory, it is possible to excerpt common assumptions from different discussions about liberalism (Battistella, 2006; Cohn, 2006). Mainly, the basic assumptions can be traced to liberal philosophers such as Locke, Kant and Hume (Hoffman, 1995; Battistella, 2006). Liberals think there is a need to implement liberal values, like individualism, freedom, political equality, popular sovereignty, constitutional government, private property rights, unrestricted commerce and peace in an international setting to alleviate poverty and counter war (Macleod and O'Meara, 2007, Puchala, 2003). They think that, by promoting those values, international relations will be gradually transformed and the world will become more prosperous and peaceful (Zacher and Matthew, 1995). Furthermore liberals believe in the good nature of mankind and think that peace and prosperity are part of everyone's common aspiration

(Macleod and O'Meara, 2007). Liberals believe that nations share common interests and that cooperation is possible (Kegley, 1995). A common interest would derive from the interdependence among states: when the activities of one influence the reality of others. Thus, every state needs to take into account the positions and actions of other states when developing their own foreign policy.

The theoretical framework used in this study appeals to the interdependence theory of Keohane and Nye (1977) and to the liberal theory of international politics of Moravcsik (1997) to explain the patterns of food aid distribution. These two liberal theories will be discussed in greater detail in the next sections.

Theoretical Framework

One of the major challenges for researchers working on food aid is to fully control all the motives underlying the allocation patterns. Indeed, Nunnenkamp and Thiele (2006) state that many donors dismiss this kind of analysis as not reflecting aid realities since it does not take into account all the aid distribution determinants. It is now widely accepted in the literature on food aid that both humanitarian needs and donor interests matter in the elaboration of food aid distributional patterns (e.g, Ball and Johnson, 1996; Neumayer, 2005; Shapouri and Missiaen, 1990; Zariadis et al, 2000; Fariss 2007). But as stated above, by omitting some determinants, many studies in the past have been biased. Thus, in this research, the five sets of hypotheses will be tested jointly. The first set of hypotheses is derived from the gravity model. The four other sets of hypotheses refer to the

aforementioned food aid categories: donor political interests, donor economic interests, good governance and recipient needs. The next section provides a discussion regarding the adaptation of the standard gravity model to food aid flows. This will be followed by the presentation of our five sets of hypotheses: gravity model, recipient needs, donors economic interests, donors political interests and governance.

The Gravity Model

Since the innovative work of Jan Tinbergen in 1962, the gravity model has been used extensively to explain international trade flows. This gravity equation was long regarded as ad hoc or without solid theoretical foundations (e.g., Deardorff, 1984, p.503), but it is now accepted that the gravity equation can be supported by different trade theories (Feenstra, Markusen and Rose, 2001). It is well known that «the gravitational force between two objects is directly proportional to the product of the masses of the objects and inversely proportional to the geographical distance between them» (169; Burger et al, 2009). Gravity models posit that the economic size of trading partners affects positively, and the distance negatively, the flow of trade between them. In this paper, the gravity equation will be adapted to explain international food aid flows.

Mass of the Recipient

It is hypothesized that the mass of the recipient country affects positively the volume of food aid. The size of the recipient country is likely to correlate with needs. In

essence, the occurrence of a food supply problem in a given country will affect more people the larger the country (e.g., Diven, 2001; Neumayer, 2005; Fariss, 2007). Furthermore, food gifts in larger countries may be more visible for policy makers (Fariss, 2007) and for citizens of those countries. Thus, it may be worth more politically speaking for governments to give to larger countries.

H1: Donor countries provide more food aid to more populous countries.

It may be argued that this study should include the population of the donor countries, in order to respect the gravity equation, but we argue alternatively that this does not apply to our theoretical framework. First, there are no reasons to believe that a country with a larger population should have a larger food aid program. On the contrary, larger countries may need more of their agricultural production to feed their population, and population is not directly related to the level of wealth in a country. A good demonstration of this situation for our study is the case of China. This country has by far the largest population of all donors included in this study, but we can easily predict that China does not have the possibility to sustain a large food aid program, since for some years, it was a recipient of food gifts. These reasons explain why we have chosen to exclude the population of the donor countries in our gravity equation.

Also, we argue that the effect of the size of the recipient population will not affect all kinds of food aid in the same manner. More precisely, we believe that it is easier for a donor country to rely on locally purchased food aid when giving in larger country. If a recipient country has a larger population, it is more likely that the donor finds some

available food in other regions of the country to buy and give back where needed. On the contrary in a small country it is harder to find region with food surplus to buy because there may be less opportunities due to the small population. In such situation donor may need to rely on triangular transactions instead of local purchase. This leads us to two more hypotheses:

H1a: Donor countries provide in proportion more locally purchased food aid to more populous countries.

H1b: Donor countries provide in proportion more food aid from triangular transaction to less populous countries.

Distance

Also, the gravity model predicts that a large distance between donor-recipient pairs may affect negatively the volume of food aid. Huang (2007) argues that distance creates unfamiliarity effects that may have a profound impact on the exports of uncertainty-averse countries to distant destinations. Countries sharing a common border or that are close to one another are more likely to have similar institutions and values. As such, individuals and firms from these countries are more likely to network and develop strong ties. Neumayer (2005) makes a similar argument by theorizing that donors want to have a regional influence. Hence, in the event of a food supply crisis in a given country, donors that are nearby are possibly more sensitive than far away countries. In the absence of religious, racial or cultural ties, a nearby donor may still be more generous simply to avoid

the migration of a hungry foreign population. Furthermore, distance is correlated with transport costs and so the cost of a transaction increases with distance (Obstfeld and Rogoff, 2000). However, this argument does not hold for food aid delivered by triangular and local transactions. Indeed, there are no transportation cost for food aid buy locally and it is not the distance between the donor and the recipient that determine transportation cost of food aid sent by triangular transactions. Thus, if distance matters for these two subcategories of food aid, it may indicate that the theory developed by Huang (2007) and Neumayer (2005) also explain this food aid practice.

H2: Donor countries provide more food aid to countries that are geographically closer to them.

Furthermore, the effect of the distance between recipient and donor should be accentuated in the situations of food aid directly transferred from donor country. Indeed, because of the high costs of transportation associated with this kind of aid, donors have more incentive reduce the distance between them and the recipients. On the contrary, sending food aid by using triangular or local transactions to a distant country is not more onerous than sending it to a closer one. Thus donors have incentive to prioritize direct transfer for closer countries and other delivery modes for distant countries. However, it is important to note that unfamiliarity effects apply to each category in a different manner. Direct transfer food aid comes from the donors own production and thus may be given more freely because donor already benefit of getting rid from food surplus. On the contrary, when donors give money (by triangular and local transactions), they may be more careful when choosing recipient countries. Because of that the unfamiliarity effects of the distance

may impact more triangular and local transactions food aid. Thus, we have two effects induced by the distance between recipient and donor countries that pressure aid decision in opposite directions. However because we control for some of the unfamiliarity effects with variables such as donors political and economic interests, we hypothesize that the effect of transportation costs will be greater than the unfamiliarity one.

H2a: Proportionally the effect of distance should be greater for direct transfer food aid than for other delivery modes.

Needs

The literature on food aid and official development aid has largely recognized that recipients' needs influence at least in part the elaboration of the donor's distributional patterns (Ball and Johnson, 1996; Eggleston, 1987; Zahariadis et al, 2000)[1]. We will show how this relates to the interdependence and the international liberalism theories.

Interdependence Theory and Needs

According to Keohane and Nye (1977), the world has been characterized by global economic interdependence (complex interdependence) since World War II. Interdependence in world politics is a situation where there is a reciprocal effect among

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[1] This work attempt to determine if the donors have been efficient in responding to the recipient needs. For studies on this subject, see Young and Abbott, 2008; Barrett, 2001; and Barrett and Heisey 2002. Particularly, Young and Abbott (2008) found that donors were more efficient in the second half of the 1990s to respond to recipient needs.

countries or among actors of different countries that results from international transactions (international trade, globalization of information, and movement of people). Before World War II, security and survival (high politics) were the main aspects of a state's foreign policy. With increasing interdependence, economics and social affairs (low politics) have gained importance (Keohane and Nye, 1977). With complex interdependence, multiple channels connect societies. Many different actors and government branches interact with other states and thus constitute players in world politic. Transnational transactions and multiple actors in the international sphere cause more mutual dependence and therefore discourage the use of military force that could undermine their own security. Thus, economic and social affairs become more important by mixing international and domestic politics (Keohane and Nye, 1977). Under such circumstances, it is in the countries' best interest to cooperate, because there will be an increase in prosperity in both countries. Beginning in 1995, a strengthened GATT agreement and agreements on services and intellectual property have been managed by the *World Trade Organization* (WTO) whose membership has increased steadily since its creation. As most recipients and all donors are members of the WTO, the world is increasingly more interdependent.

International Liberalism and Needs

According to this liberal theory, it is a misconception to consider the state as the only actor in international interactions. Rather individuals, firms and groups should also be considered among the actors who are present in international relations (Rosenau, 1980; Moravscik, 1997). Thus, every state represents different groups from its domestic society. This implies that each state has its own perception and combination of interests and does

not aim automatically to maximize a homogeneous form of security, sovereignty and wealth (Moravscik, 1997). These actors are assumed, on average, to act rationally with an aversion to risk in the pursuit of material and ideal welfare (Moravcsik, 1997). States actions are conditioned by the beliefs and desires of different groups within their society. As a result « government policy is constrained by the underlying identities, interests, and power of individuals and groups who constantly pressure the central decision makers to pursue policies consistent with their preferences» (Moravcsik, 1997; p. 518). Clearly, to the extent that public opinion can be moved by noble sentiments, government decisions may ultimately be driven by such sentiments.

As we explained earlier, people often misunderstand food aid. Public opinion has in majority a humanitarian vision of food aid (Barrett and Maxwell, 2005) and this could influence the policy choice of a donor country for their food aid program. Citizens of donors' countries believe and want that their country uses food aid for humanitarian purposes. Therefore, government, representing those individual and societal groups, may give to country that really needed. Indeed, referring to a poll conducted by Innovative Research Group for the Munk Centre for International Studies: « most Canadians want to give [aid] to poorer countries» (Campbell, 2009).

H3: Donor countries provide more food aid to countries with larger needs.

Furthermore, the importance of needs as a determinant of food aid allocation decisions should be enhanced in situations of emergency food aid. Emergency food aid

aims directly at attenuating the effect of food shortage in crisis situations. Thus the effect of needs, in form of food shortage should be greater for emergency food aid.

H3a: Proportionally donor countries account more for needs for emergency food aid than for other categories of food aid.

Economic Interests of Donors

Prior to the end of the Cold War, the impact of economic interests on food aid distributional patterns was tested several times and the results were mixed. Zahariadis et al (2000) found that under certain conditions the recipient's amount of importations from the donor influenced the patterns of food aid. Eggleston (1987) studied agricultural trade and found that agricultural imports and food aid were substitute goods. It appears that economic interests are less important than political and military interests in explaining the patterns of food aid. Even though some scholars had predicted that the end of the Cold War would boost the importance of economic interests to the detriment of political interests, there is a lack of empirical evidence supporting the validity of this prediction (Barrett and Maxwell, 2005). Neumayer (2005) is the only researcher who constructed a variable to assess the importance of this category of determinants and it turned out that his measure of food exported from the donor to the recipient country was found non significant.

Food Aid and World Trade Organization

Food aid is recognized to possibly be export dumping and thus reducing domestic production in recipient country (Cardwell, 2008; Oxfam 2004). These tensions between trade and food aid are not new. Already in 1954, the international community recognized the possible negative effect of food aid. Indeed, food aid «was seen as a disguised means of export dumping and therefore an unfair means of competition in agricultural trade» (Cathie, 1997, p.9). Thus, the Consultative Subcommittee on Surplus Disposal (CSSD) was created to monitor food aid practices. Later, the Food aid Convention (FAC) was negotiated parallel to the Kennedy Round trade negotiation. However the efficiency of the CSSD and the FAC are questionable (Cardwell, 2008). At the *World Trade Organization*, the Agreement on Agriculture has only been achieve in the Uruguay round. In this agreement, the WTO recognized that food aid might be use as a tool of surplus disposal (Cardwell, 2008). However, no binding rules where elaborated in the Uruguay round on food aid. During the current negotiations of the Doha Round, members tried to come with binding rules on food aid, but they still not have reached a consensus. Thus, to this date we still do not have any binding rules on food aid.

Interdependence Theory and Economic Interests of Donors

The liberal interdependence theory explains why donors' economic interests matter in the elaboration of food aid distribution patterns. As stated previously, interdependence encourages cooperation. However, Keohane and Nye (1977) explain that the level of interdependence is variable in time and in space. The fluctuations in the number of

transactions with different countries produce different levels of interdependence between dyads of donor-recipients. By the same token, a donor should be more prone to give to a recipient with which it has a higher level of interdependence. Since interdependence can be economically defined by the monetary values of transactions, it could be presumed that donors may be more prone to give aid to larger economic partners.

H4: Donor countries provide more food aid to countries with which they trade more.

International Liberalism and Economic Interests of Donors

The original American food aid law, PL- 480, mentions that the program could serve to develop new markets. Germany and France also admit to using food aid to promote trade (Cathie, 1997). Many donors are net exporters of agricultural goods (United States, Canada, France, Germany, Australia). Agricultural lobbies might have enough clout to influence their country's foreign policy and food aid program (e.g., Barrett, 1998; Diven, 2001; Diven 2006; Fariss, 2007; Barrett and Maxwell, 2005; Cardwell, Fridfinnson and Rude, 2007). Indeed, in many donor countries, it has been convincingly argued that the absolute volume of food aid allocation is determined by agricultural surpluses (Eggleston, 1987; Ball and Johnson, 1996; Shapouri and Missiaen, 1990; Cathie, 1982; Webb, 2000; Barrett 1998). Besides helping the development of the recipient country, a food aid program may develop future export markets for a donor's agricultural producers (Ball and Johnson, 1996; Barrett 2001; Barrett and Heisey, 2002; Diven, 2001; Diven, 2006). Some argue that habit formation in food consumption could be initiated by giving foods to eventually sell the same foods (Barrett and Maxwell, 2005). Watkins (2004) outlines a

situation in the 1990s where food aid may have served to develop new markets: «in the early 1990s, the Philippines was unable to sustain imports of high protein soya meal because of foreign exchange difficulties. PL- 480 was used to help finance the purchase of U.S. exports. Ten years later, the Philippines was the largest market for U.S. high-protein soybean meal, with American exporters accounting for 90 percent of total imports» (USDA/FAS 2001b p. 7 quoted as in Watkins, 2004). Assuming that donor countries wish to develop markets through food aid gifts, then the recipient countries' economic openness would have a significant influence on the official development assistance distribution patterns (Meernik, Krueger and Poe, 1998). Alternatively, it could be that countries with restrictive market access policies are more likely to face food supply shortages and hence have more urgent and larger needs.

H5: Donor countries provide more food aid to countries with more open economy.

Good Governance

The literature on food aid distribution has little to offer regarding the effect of good governance in the recipient countries. The only aspect of good governance that has been studied is the respect for democratic norms. Such studies on the impact of democratic commitment in recipient countries on the patterns of food aid have produced mixed results (Zahariadis et al, 2000 and Fariss 2007). We rely on Eric Neumayer's (2003) definition of good governance which states that: « the way in which policy makers are empowered to make decisions, the way in which policy decisions are formulated and implemented and the

extent to which governmental intervention is allowed to encroach into the right of a citizen» (p.18, 2005). This should result into the establishment of «a predictable, impartial and consistently enforced set of rules for investors » to allow a «sustained and rapid growth in the per capita income of poor countries» (Knack, 2001, p.311). By contrast, the literature on official development aid includes studies on diverse aspects of governance. Here we only present some of those aspects of the debate on governance, aid and growth. First, the article of Burnside and Dollar (2000): *Aid, Policies, and Growth* created a large debate in the development literature. This study states that aid is wasted when given to a country with poor economic development policies and institutions, since it fails to induce growth. Many critics responded to this article by arguing either that aid is efficient, but it effectiveness varies or that aid is always inefficient (Dalgaard et al, 2004; Hansen and Tarp, 2000,2001; Dalgaard and Hansen, 2001; Easterly, Levine and Roodman, 2003; Dayton-Johnson and Hoddinott, 2001, 2003; Guillaumont and Chauvet, 2001; Lensink and White, 2001). Also, Alesina and Weder (2002) found that corrupted governments did not receive less foreign aid than the non-corrupted ones and Neumayer (2003) found that human rights do not matter much in aid allocation. Furthermore, Abouharb and Cingranelli (2007) argue Structural adjustment agreements, condition for the aid of the *International Monetary Fund* (IMF) and the *World Bank*, has induce a worsening of human right and also lower economic development in recipient countries. In *The Pattern of Aid Giving, The impact of Good Governance on Development Assistance* (2003), Neumayer shows that many aspects of good governance influence aid distribution patterns.

Interdependence Theory and Good Governance

Many reasons may explain why donor countries would take into account good governance in deciding who to give to and how much food aid to give. First, good governance involves the respect of fundamental liberal values, like individualism, freedom, political equality, popular sovereignty, constitutional government, private property rights, unrestricted commerce. In an interdependent world, where most donors are democracies that share most of the aforementioned values, donors may prefer to give to countries they can relate with in terms of their values. This way, donors could contribute to the promotion of these values. On the contrary, Fariss (2007) has developed a theoretical framework explaining that US policymakers may give more food aid to countries with less respect of human rights, because they are legally bound and cannot give other forms of aid to the needy population.

International Liberalism and Good Governance

Businesses wishing to engage in foreign direct investment may pressure their government to help countries with a good system of governance to the extent that it can improve the business environment for foreign investors. Also, taxpayers concerned with government waste may pressure their government to target countries with good governance in order to avoid food aid theft and waste. Joseph Hanlon (2004) believes that people in need are not as likely to have access to food aid if their government is corrupted. He likened giving aid to Mozambique in the 1990s to promoting corruption. Also, the literature on official development assistance has argued that aid may be wasted when given to a

country with poor economic development policies and institutions (Burnside and Dollar, 2000). At the same time, agricultural production, import, food processing and distribution activities are likely to be conducted in a less efficient manner in corrupted countries than in non-corrupted ones. One could infer that corrupted countries are more likely to have bottlenecks in their food supply and to have greater needs for food aid. Furthermore, many governments claim that they favor poor countries with better policies and institutions (Nunnenkamp and Thiele, 2006). The USAID states that «US foreign assistance has always had the twofold purpose of furthering America's foreign policy interests in expanding democracy and free markets while improving the lives of the citizens of the developing world» (USAID, 2006 as quoted in Fariss, 2007). Table 2.1 gives other examples of government claims about the need or the impact of good governance in recipient countries on their aid patterns.

H6: Donor countries provide more food aid to countries with better governance.

Table 2.3 Donor's commitment to good governance

Norway, 1984	«In 1984, a White Paper threatened aid cut-offs to countries whose government takes part in, tolerates or directly executes violations of human rights». (Tomasevski 1997, p.24 as quoted in Neumayer 2003)
Canada, 1987	«In 1987 a new aid strategy stated that in countries where violations of human rights are systematic, gross and continuous, and where it cannot be ensured that Canadian assistance reaches the people for whom it is intended, government to government (bilateral) aid will be reduced or denied, whereas countries with a good record can expect to receive more aid». (cited in Keenleyside and Serkasevich 1989:139, as quoted in Neumayer 2003)
Sweden, 1990s	«Sweden, which had traditionally put emphasis on democratic development in its aid programme, explicitly added respect for human rights and good public sector management as goals of its programme in the 1990s». (Crawford, 2000 as quoted in Neumayer 2003, p.11)
European Community, 1991	«The EC claims that it uses democracy, respect for human rights and the rule of law, effective and accountable public sector management, low corruption and non-excessive military expenditures as part of the criteria according to which countries in Africa, the Caribbean and the Pacific with historic links to the EC (so-called ACP countries) are allocated aid within the framework of its Lomé Convention (now: Cotonou Agreement)». (EU Council of Ministers 1991, as quoted in Neumayer, 2003, p. 10)

United Kingdom, 1991	«Baroness Chalker, then Minister for Overseas Development, listed the promotion of sound economic and social policies, the competence of government, democracy, respect for human rights and the rule of law as the essential aspects of GG in a speech held in June 1991». (Crawford 2000, p. 60 as quoted in Neumayer, 2003, p.10)
Japan, 1992	«Japan passed a Foreign Aid Charter in 1992, which puts emphasis on democracy, human rights and low military expenditures as important aspects of good governance to influence its aid allocation». (Japan MOFA, 1992 as quoted in Neumayer, 2003)
Germany 1991	«Germany listed respect for political freedom and human rights, rule of law, market-friendly economic policies and non-excessive military expenditures among its criteria of good governance to impact upon its aid programme». (Tomasevski, 1997, p.29 as quoted in Neumayer, 2003)
OECD, 1993	«It has become increasingly apparent that there is a vital connection between open, democratic and accountable systems of governance and respect for human rights, and the ability to achieve sustained economic and social development. (…) This connection is so fundamental that participatory development and good governance must be central concerns in the allocation and design of development assistance». (OECD-DAC 1994, p.7 as quoted in Neumayer, 2003, p. 10)
European Community, 1996	«In regulation 1292/96, the EC laid down strict criteria for the granting of aid and specified that recipients must be politically stable and have an operational food security plan». (Young and Abbott, 2008, p.30)

Political interests of Donors

Many studies have looked at the different donor's political interests to explain the patterns of food aid. Studies focusing on the Pre- and Cold War era tested mainly hypotheses regarding the military ties between the donors and the recipients (Eggleston, 1987; Ball and Johnson, 1996; Zahariadis et al, 2000). As for the Post-Cold War analyses, they focused on the political links in international organizations and on cultural similarities between a donor and a recipient (Neumayer, 2005).

Interdependence Theory and Political Interests of Donors

For this study, political ties will be considered as a proxy to political interests of donors in recipient countries. Keohane and Nye (1977) identify the three main characteristics of complex interdependence. The first one enumerates the different types of political ties: «Multiple channels connect societies, including: informal ties between governmental elites as well as formal foreign office arrangements; informal ties among nongovernmental elites; and transnational organizations» (p.24, 1977). Political ties are key channels linking countries to one another, thus creating a state of interdependence. The more interdependence there is between the donor-recipient dyad, the more likely and the larger the flow of food aid.

H7: Donor countries provide more food aid to countries with which they maintain close political ties.

Donor should always give more food aid to politically friendly countries regardless categories or delivery modes. However, as we stated above, when donors give food from their surplus, they are less particular about which country they are sending it to because it benefits them already. On the contrary when donors do not give from their food surplus they may be more careful in their aid decisions. Thus political ties should impact more triangular and local transactions food aid because this aid does not come from a donor's surplus.

H7a: Proportionally donor countries account more for political ties triangular and local transactions food aid than direct transfer food aid.

We have now completed the derivation of all of our hypotheses. In the next section we will present another important contribution of this thesis: the two-stage decision making process.

Two-stage decision making process

Some scholars have argued that the theoretical framework of aid patterns elaboration should distinguish between two stages (e.g., Cingranelli and Pasquarello, 1985; Zahariadis et al, 2000; Neumayer, 2005). Following interviews with some U.S. practitioners, Cingranelli and Pasquarello (1985) were the first to propose that aid decisions were taken into two separated steps.

In a first stage, donors chose recipient countries, and then allocate different quantities of aid to those countries in a second stage. At the initial stage, some countries would be automatically excluded for many different reasons and others would reach the second step where the level of aid is chosen. Following the theoretical framework developed above, the likelihood of cooperation is associated with different factors such as divergence in fundamental beliefs and extreme scarcity (Moravcsik, 1997). Indeed, it is in this stage that a donor will select recipients and rule out some countries for different reasons. In the second stage, donors will decide how much food aid they will give to the recipient.

Some previous studies on food aid have already distinguished between those two stages and found distinctions between the motives underlying the two different stages (Zahariadis et al, 2000; Neumayer, 2005). However, those previous studies only analyze specific aid programs and do not include all donors we include. Taking into account these two stages allow us to better understand all donors behavior. With this methodology we will be able to distinguish which factors are important in the selection of the potential recipient list. In theory it could also be possible that an indicator influences both step, but with a different sign. For example, some donor may be less prone to give food aid to donor with less respect of democratic norms, but when they give to such recipient with poor records of democratic respect they give a lot because they want to influence the recipient government. Thus, this methodology will help us to identify if such situations occur.

In this chapter, we first defined food aid, its delivery modes and its categories. Secondly we built a theory on its distribution patterns. Indeed we stated that larger

population, needs, level of economic liberalization, political affinity and trades with the donor the recipient had and better is it governance, the more food aid he will receive. On the contrary, distance between donor and recipient reduce the amount of food aid exchanged. In the next chapter, we will explain how we will test these hypotheses by elaborating our empirical strategy.

CHAPTER 3: EMPIRICAL FRAMEWORK

In chapter 3 we first provide a review of past strategy to model food aid. Then we discuss how gravity model literature inspired our choice of using both random-effects negative binomial and double hurdle estimators. This is followed by an explanation of variables chosen for this study and we conclude this chapter with a review of our empirical models.

Estimators

Modeling food aid is not an easy task. From an econometric perspective, the main problems are the high number of zeros in food aid flows and the heteroskedasticity due to the panel nature of the data. There is much debate regarding which method should be used to deal with these econometric issues. Early food aid studies used Ordinary Least Squares (OLS) regressions (Ball and Johnson, 1996) even though the basic assumptions behind OLS are not likely to hold when modeling food aid (Wooldridge, 2006; Neumayer, 2003). For example, the high frequency of zeros causes a problem because OLS predictions are not censored at zero thus allowing for nonsensical negative gifts. Excluding all zero observations is not a solution because this would cause a sample selection bias. A better way to manage the high frequency of zeros is by using a Tobit estimator as in Eggleston (1987). Even though this estimator is usually better than OLS in dealing with zeros, its performance can be impeded by heteroskedasticity (Cameron and Trivedi, 2009). Zahariadis et al., (2000) use a two-step estimator to analyze food aid. In the first equation, a

Probit or a Logistic regression is used to analyze the donor's decision to give or not to give. This binary choice model determines who gets food aid. For the second step, the sample is truncated to retain only positive food aid flows and an additional regressor is added to account for the first step. This method is also sensitive to heteroskedasticity and previous tests showed the presence of heteroskedasticity in our model.

Gravity model literature encounters the same econometric issues, high presence of zeros and possible heteroskedasticity. From their Monte Carlo simulations, Santos Silva and Tenreyro (2006) recommend the use of the Poisson Pseudo-Maximum-Likelihood (PPML) estimator for the gravity equation. Gourieroux et al., (1984) show that a Poisson regression is efficient even when the data does not follow a Poisson distribution. The PPML multiplicative form deals in a "natural way" with the presence of zeros (641; Santos Silva and Tenreyro, 2006) and it produces coefficient estimates that are consistent in the presence of heteroskedasticity and efficient, especially in large samples (King, 1988; Santos Silva and Tenreyro, 2006; Burger et al., 2009). However, prior testing showed that the high presence of zeros induces overdispersion and violates the equidispersion property of the Poisson regression. Consequently, we will rely on a random-effects negative binomial regression as suggested by Cameron and Trivedi (2009). However, Burger et al (2009) and Martin and Pham (2008) argue that the Poisson regression is potentially biased in situations where the dependent variable contains a high proportion of zeros and respectively suggest using a zero inflated Poisson (ZIP) and threshold Tobit estimators. Since there is still an ongoing debate about which estimator is better to deal with the high presence of zeros in the literature on gravity models, we will implement two models, a random-effects negative binomial and a selection model. Following Burger et al (2009), we

first tried a random-effects zero inflated Poisson and random-effects negative binomial, but both models did not converge. We thus turned our choice on a random-effects Tobit estimator. However, post estimation tests showed over prediction and heteroskedasticity. Thus, to assess the robustness of our estimates, we will implement a double hurdle model, with a random-effects probit and a random-effects generalized least squares estimators. We first estimate a probit and calculate it mills ratio, and secondly estimate the generalized least squares with the mills ratio included as a regressor. As we will show subsequently, in some cases the mills ratio was not significant and thus statistically speaking there was no selection bias. When that occurs, we simply withdraw the mills ratio from the second equation.

The period of analysis for this study is 1988 to 2002. The period begins and ends in 1988 and 2002 because data for some variables are not available before or after this period. This research includes all donors that have given at least one percent of food aid flows during any year of the period analyzed. Only Russia and the Republic of Korea have been excluded even though they fulfill the previous conditions, because they only gave major gifts of food to, respectively, the Ukraine and the Democratic People's Republic of Korea under particular conditions. Thus, they do not have an official food aid program, giving a large amount of aid sporadically to a friendly country. As a result, donor programs included in our sample are Australia, Canada, China, Denmark, the European Community, France, Germany, Italy, Japan, the Netherlands, Norway, Sweden, the United Kingdom and the United States. The possible recipients are all countries that received food aid during the period covered by our sample and all countries that are included in the Food Aid Convention as possible recipients and countries that are defined as developing countries by

the *International Monetary Fund*. Due to a lack of information, French Guiana, Hong Kong and American Samoa have been excluded from our sample; therefore this study considers 155 potential recipients.

Variables

The dependent variable of this study is the food aid level sent by a donor country i and received by the recipient country j calculated in thousand-ton grain equivalents. This variable comes from the FAIS program of the *World Food Programme* and has been used in previous studies (Ball and Johnson, 1996; Neumayer, 2005; Young and Abbott, 2008).

To test the first hypothesis that predicts donor countries provide higher levels of food aid to more populous countries, the variable POP, representing the population of each recipient country, is used. This variable comes from the *World Bank* (WB). We also hypothesize that donor countries provide more food aid to countries that are geographically closer to them. The variable DIST, representing Head and Mayer's (2002) harmonic distance measure between the donor and the recipient for each dyad is used. For the European Community, the data from Belgium were used.

Secondly for hypothesis H3: donor countries provide higher volumes of food aid to countries with a higher level of need for food aid, we use the variable recipient food supply which is defined as the total amount of food available for human consumption expressed in Kcal/per capita/per day. This indicator has been used in other food aid studies (Hermann et

al, 1992; Young and Abbott, 2008; Neumayer, 2005; Eggleston, 1987) because it represents quite accurately food aid needs at a macro level. Our development indicator is the GDP of the recipient country from Penn World Table (Ball and Johnson, 1996; Shapouri and Missiaen, 1990; Hermann et al, 1992; Neumayer, 2005). A negative sign for all need indicators is expected.

Thirdly, there are three different indicators for the group of variables capturing economic interests. Our fourth hypothesis posits that donor countries provide more food aid to countries they have a higher level of trade interdependence with. We use the volume of trade between the dyad to test this hypothesis. trade is simply the sum of exports and imports of the donor country to and from the recipient country. The more trade there is between the dyad, the more they are interdependent. This variable was taken from Correlates of War. As discussed in the theoretical framework, it is possible that some food aid programs are influenced by future export market considerations.   Our fifth hypothesis links food aid to economic openness of the recipient country and the indicator used to test this hypothesis is the variable recipient economic openness from Penn World Table. It is computed as the sum of exports and imports divided by GDP. For Trade and recipient economic openness positive signs are expected.

Our sixth hypothesis is about donor countries providing more food aid to countries with better governance. Many variables should be used to assess the impact of good governance on the food aid distributional patterns. But using all variables, representing every aspect of good governance in the same regression brings multicollineraty. Thus we will analyze our fifth hypothesis in two stages. First, we will use the variable recipient

respect of democratic norms to evaluate the impact of respecting the democratic norms on food aid allocation patterns in the main regression. This variable is built from two indicators: civil liberty and political rights that were elaborated by Freedom House. But as we stated before governance has many other aspects and thus in another section we will report the result for the different dimensions of good governance. Thus, we should only interpret the results of this variable as representing the recipient respect of democratic norms and not other governance dimensions. The variable recipient respect of democratic norms has been used in many studies. The sign expected for this variable is negative.

Finally, we use the Index of United Nations Voting Similarity developed by Erik Gartzke (2006) (UN voting similarity) to test the seventh hypothesis that states that donor countries provide more food aid to countries they have closer political ties with. This variable measures the similarity of voting records of the donor and the recipient in the United Nation's General assembly and represents a good indicator of political convergence. The countries that share the same political vision should vote the same way on most of the resolutions. Neumayer (2005) used this variable. UN voting similarity should have a positive sign. Appendix 2 shows a summary of all variables,

Empirical models

Poisson

Random-Effects Negative Binomial

E (level of food aid) = α + B1 (LN(Recipient food supply)) + B2 (LN(Recipient GDP per capita)) + B3 (LN(Trade)) + B4 (LN(recipient economic openness)) + B5 (LN(Recipient respect of democratic norms)) + B6 (LN(UN voting similarity)) + B7 (LN(Distance)) + B8 (LN(Population) + E9[2]

The group variable is the donor-recipient pair and there are a total of 1932 groups

for which we have 15 years of data.

Selection Model

First Stage

Random-Effects Probit

E (food aid)i = α + B1 (LN(Recipient food supply)) + B2 (LN(Recipient GDP per capita)) + B3 (LN(Trade)) + B4 (LN(recipient economic openness)) + B5 (LN(Recipient respect of democratic norms))+ B6 (LN(UN voting similarity)) + B7 (LN(distance)) + B8 (LN(Population) + E9

I= for every dyads of donor- possible recipient

E (food aid)i = 1   if the country received food aid

E (food aid)i= 0   if the country did not receive food aid

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[2] All estimations were performed with Stata 11.

The group variable is the donor-recipient pair and there are a total of 1932 groups for which we have 15 years of data. Because of missing observations, we have a total of 26189 observations. At this stage, we also calculate the mills ratio: probability density function / cumulative distribution function.

Second stage

Random-Effects Generalized Least Squares

E (log of food aid) = α + B1 (LN(Recipient food supply)) + B2 (LN(Recipient GDP per capita))+ B3 (LN(Trade)) + B4 (LN(recipient economic openness)) + B5 (LN(Recipient respect of democratic norms)) + B6 (LN(UN voting similarity)) + B7 (LN(Distance)) + B8 (LN(Population) + B9 (MILLS) + E10

The group variable is the donor-recipient pair and there are a total of 1932 groups for which we have 15 years of data. In such situations where the mills ratio was non significant, we simply withdraw it.

In this chapter we presented justifications for our econometric choices. First, we established we would need to rely on both a random-effects negative binomial and a random-effects double hurdles model. We also settled the temporal and geographic dimensions of this study: we considered all donors that have given at least one percent of food aid flows during any year from 1988 to 2002 and all potential recipients included in the Food Aid Convention as possible recipients and countries that are defined as developing countries by the IMF. We put a lot of emphasis on this because it is a first in food aid literature. In previous studies, only the United States and sometimes other large program such as the European Community and Canada had been considered. By adapting the gravity

model to food aid, we provided a more complete scheme of food aid distributional patterns. Finally, we justified our choice of variables and presented our empirical models.

Before turning to chapter 4, it may be important to do a brief recapitulation. In chapter one, we clearly demonstrated how our research adds to the food aid literature and why in the present context it is important to do this research. Chapter two presented definitions of the different concepts linked to food aid and we established our theoretical framework on food aid distribution. We presented many hypotheses to cover all possible motives underlying decisions of food aid allocation patterns. In the present chapter we explained how we would test these hypotheses. Finally, in the remaining chapters of this paper we will analyze different results obtained from these estimations and explain their implications.

CHAPTER 4: RESULTS AND INTERPRETATIONS

In chapter four we will first present the fit of the two estimators and how to interpret the different results. Secondly, we will introduce results of total food aid. However we will subsequently demonstrate that we may misinterpret some results by omitting to break down the data into different aggregations. That is why we present, for the first time in a study asserting food aid distributional patterns, results for the three different categories and delivery modes of food aid.

Negative Binomial, Double Hurdles or Both?

Econometric theory, as we explained in chapter three, supports both estimators chosen in this work, but do these models fit exactly the same way our data does? No. We will first rely on the random-effects negative binomial for many reasons. Many test showed that our empirical models contain heteroskedasticity. Estimators from the Poisson family deal in a better way with heteroskedasticity than the double hurdles model. Also, in theory we should have different variables for the two different stages in the hurdle model. However as Neumayer (2005) notes, it is hard in the case of food aid distributional patterns to find a theoretical explanation and effectively we did not find such variables. Thus, we will first analyze results of the negative binomial and we will use the double hurdles model as a robustness check. The next section will analyze more aspects of the fit of the models.

Fit of the Models

Table 4.1 presents results for total food aid regressions. Total food aid includes all food aid sent bilaterally no matter the category or delivery mode. From this table, we can establish that our two models are quite good at predicting the food aid allocation patterns. First, all variables are significant with the exception of distance at the first stage of the double hurdles model and recipient economic openness at the second stage. Secondly, the Wald Chi of both models is high, that indicates the models perform well. However, the Wald Chi from the PPML estimator is higher than the one of the selection model. This is the case for almost all regressions in this research. That is one reason among many, why we find the negative binomial more reliable. Also, the two different estimators give us qualitatively robust findings for most variables. But, the two models present quantitative dissimilarity. We will give more explanation in the next section, an «interpretation» of this phenomenon. Another important fact to note is that the mills ratio of the allocation equation of the selection models is significant. This indicates that both equations are correlated and that the double hurdles model is pertinent. For all other equations in this chapter, with the exception of one, the mills ratio was not significant. This shows that the two stages are not interrelated and also tends to indicate that the negative binomial helps better our research.

To summarize, even if econometric theory supports our two estimators, the presence of heteroskedasticity in our data and the absence of theoretical reasons for different variables in our two-step estimator bring us to give more cloud to the results of the negative binomial in our interpretation. Furthermore, analyses of the fit of the estimators support our

decision of considering more the negative binomial than the two-step estimator. However, at this point it is important to note that most of the time our two estimators are consistent with each other. In the next section we present how to interpret the results from this research.

Interpretation

How can we interpret the different results of the two models? Coefficients are not always sufficient to get a good picture of the situation. That is why we will rely on elasticity to quantify the effect of one variable on the amount of food aid flows keeping all other variables fixed. Elasticity measures the percentage of change in the dependant variable associated with the percentage of change of the independent variable. Thus, if we look at table 4.1, we notice that at the allocation stage, the selection model predicts that a one percent increase of food availability for human consumption is associated with a 4.156752 percent decrease of food aid flow. To obtain elasticity, we need to operate different transformations on the coefficients of each estimator. Here are some details about these modifications. From Cameron and Trivedi (2010, p.576), coefficients of the random-effects negative binomial can be interpreted as semi-elasticity. However, since our model uses regressors in logarithmic form, we can interpret directly our coefficients as elasticity. It is not that easy for the double hurdles model, each stage needing different modifications. Cameron and Trivedi (2010, p.460) show that the marginal effect of a probit, that is a standard normal cumulative of our coefficients and variables ($F(x) = \Phi(\mathbf{x'\beta})$), is the probability density function multiplied by its coefficient ($\phi(\mathbf{x'\beta})\beta_j$). Thus, if we want to

obtain elasticity we only have to divide its marginal effects by the standard normal cumulative:

Elasticity $= \phi(\mathbf{x'\beta})\beta_j / \Phi(\mathbf{x'\beta})$.

For the second stage of the double hurdles model we need to choose between conditional (considering only positive observations) or non-conditional elasticity (considering all observations). Because zeros are not due to missing observations in our regressions, we will use non-conditional elasticity to obtain the effect of variables on all observations. Yen and Rosinski (2008) derive the right formula for the unconditional marginal effect of log-transformed sample selection models:

Marginal effect $= \exp (\mathbf{x'\beta} + \text{sigma}^2/2) \{\phi(\mathbf{z'\alpha} + \text{rho*sigma}) \alpha_j + \Phi(\mathbf{z'\alpha} + \text{rho*sigma}) \beta_j\}$

From this equation, we can obtain elasticity with the following formula:

Elasticity $= \beta_j + (\text{Aj } \phi(\text{Rho*Sigma} + \mathbf{x'A}) / \Phi(\text{Rho*Sigma} + \mathbf{x'A}))$

We can now compare the results of the different estimators on the same basis; the effect of an augmentation of one percent of a variable associated with an elasticity representing the proportion of augmentation of the dependent variable. Results from the probit differ because it does not measure the volume of food aid flow, but the probability of obtaining some. However, as we said, elasticity from the allocation stage is larger than the

one from the negative binomial even if it measures the same effect. This may have two explanations. First, it might be due to the fact that even if we withdraw the zeros from the second step of the selection model, a generalized least square may predict negative values for the dependent variable, thus augmenting its standard deviation and by the same token the effect of the independent variables on food aid flows. Secondly, it may be due to the presence of unobserved heteroskedasticity for the double hurdles. Thirdly, since the mills ratio is calculated from independent variable in the selection variable, the mills ratio may be correlated with the same variable found in the second stage and that creates multicollinearity (Green, 2007). Indeed Santos Silva and Tenreyro (2009) confirm that truncated estimators and Tobit may have a large bias and be less effective than the PPML, even in the large presence of 0. Therefore we should principally use the results from the random-effects negative binomial for interpretation.

Total Food Aid

We will now look more specifically to the effect of each variable on the food aid allocation patterns. We start with table 4.1 that illustrates results from total food aid. Next, we look at the impact of the different categories and delivery modes of food aid and find interesting results suggesting that we should always break down the data to avoid misinterpretation.

Table 4.1 Results for Total Food Aid Distribution Patterns, 1988-2002

Variables	Poisson	Selection			
	Random-Effects Negative Binomial	Random-Effects Probit		Random-Effects GLS	
		Coefficient	Elasticity	Coefficient	Elasticity
Recipient food supply	-1.235*** (0.115)	-1.905*** (0.182)	-3.143	-2.539*** (.623)	-4.157
Recipient GDP per capita	-0.552*** (0.022)	-0.624*** (0.034)	-1.029	-1.252*** (0.201)	-1.986
Trade	0.114*** (0.007)	0.114*** (0.012)	0.188	0.291*** (0.039)	0.425
Recipient economic openness	-0.065** (0.025)	-0.145*** (0.039)	-0.239	-0.063 (0.073)	-0.233
Recipient respect of democratic norms	0.117*** (0.035)	0.226*** (0.044)	0.374	0.189* (0.103)	0.455
UN voting similarity	-1.096*** (0.077)	-0.811*** (0.140)	-1.338	-1.684*** (0.300)	-2.639
Distance	-0.167*** (0.028)	-0.030 (0.0508982)	-0.049	0.229** (0.098)	0.193
Recipient population	-0.074*** (.0120389)	-0.037* (0.021)	-0.061	0.093** (0.037)	0.049
MILLS				1.590*** (0.434)	
Number of obs	26037	26037		7367	
Number of groups	1877	1877		1135	
WALD CHI2	2143.07	1219.41		305.52	

The majority of the variables in our regressions have significant coefficients with the expected sign. To begin with, the gravity model variables confirm that when the donor and recipient are geographically closer, food aid flows tend to be larger but invalidate those results when the recipient country has a larger population. Surprisingly, food aid tends to flow more to smaller countries. However those results need to be taken with care, the two models predict very small elasticities. Indeed the negative binomial predicts that an increase of one percent of the population is associated with a decreased of .0373063 in food

aid trade. As we will see, the desegregation of food aid into its different categories will challenge these results. Also, the development variables are both negative, indicating that donors consider the recipients' needs in terms of food shortage and economic development. Furthermore, table 4.1 shows that both models predict that food availability for human consumption have the largest effect on food aid flows. That is quite interesting and may indicate that food aid is well targeted to countries with shortage of food.

Contrary to a previous study of the same period (Neumayer, 2005), we find that the variable capturing the donor's economic interest, trade, influences significantly the food aid patterns. However, the openness of the economy seems to influence negatively the probability of food aid flows. The fact that concessional sales are considered as food aid may explain this situation. Donors could use food aid to sell food to less economically open countries. Also, if they predicted that they would not have access to these markets, they may want to ship food aid there since it does increase the price of food in other more open markets. It may also indicate that closed economies have more needs of food aid. The prediction that openness matters in food aid allocation patterns is robust for every estimator. We will gain a better understanding of the relations between food aid allocations patterns and economic openness of recipient countries when analyzing the different categories of food aid.

Surprisingly, the variable capturing recipient respect of democratic norms influences significantly the food aid patterns, but in the opposite way than the one expected. It appears that good governance crowds out food aid. We find that an increase of one percent on the Freedom House scale is associated with a decrease of .1165886 of food

aid flows. This is contrary to what Zahariadis et al (2000) found, but in line with Fariss (2007). Thus, with respect to the theory of Fariss (2007), donors give more food aid to recipients with a bad record of democratic values since they may be forbidden to send other forms of aid. Knowing that, the literature on official development assistance has argued that aid may be wasted when given to a country with poor economic development policies and institutions (Burnside and Dollar, 2000); it is quite frightening that a lot of food aid may be misused. However, we will soon see that for this variable, categories also matter. In a following chapter we will look at other forms and indicators of governance.

Also surprisingly and contrary to Neumayer (2005) we find that food aid flows less between countries that vote similarly at the UN general assembly. Furthermore, this variable has the second highest elasticity and thus seems to influence in a great manner food aid flows. But we find no theoretically good explanation for this situation. So, for the moment, we hypothesize that donors may not consider political divergence. This result may correspond to the voting difference between less develop and develop country. When breaking down data into the different delivery modes, we will be able to gain a better understanding of this phenomenon. We will present really interesting findings about the link between political ties and food aid flows.

To summarize, in this section we found results supporting the previous literature on food aid, but we also innovated. Indeed, needs indicators, distance and governance indicators support previous literature on food aid, and economic interests variable, and political affinity indicators give us some original result. However, many of these findings will be augmented with the next regressions.

Food Aid by Category

Since the first chapter of this thesis we have emphasized the importance of breaking down the data of food aid flow into its different categories because it helps getting a better understanding of the food aid distribution patterns, but we did not explain why. That is what we will do in this section besides presenting what have been done in the literature until now, and give an illustration of the usefulness of doing so. Let us start by doing a review of what has been done in the literature.

As we explained earlier, most studies on food aid distribution patterns looked at the American program. Also, most of these studies analyzed total food aid (Eggleston, 1987; Barrett, 2001) or different aggregation of the three titles of PL-480 law (American food aid law) (Ball and Johnson, 1996; Zahariadis et al, 2000), but no one looked at the three categories as previously presented. Using the three previously mentioned categories is better. This because these categories are common to all donors and each category can be associated with a different goal; humanitarian assistance, development project or government support. Other studies considered European, Canadian or World Food Programme but did not break down the food aid data into its three different categories (Hermann et al, 1992; Shapouri and Missiaen, 1990; Barrett and Heisey, 2002). However some studies have already recognized and analyzed some of the differences between the categories (Neumayer, 2005; Young and Abbott, 2008). Neumayer (2005) assessed the food aid distribution patterns of the United States, European Community, World Food Program and Non-governmental organizations by differencing between emergency food aid

and the other two categories. However, Neumayer' study does not consider the difference between project and programme food aid. These two categories of food aid aim at different goals. Programme food aid is sold on the open market, it may be provided as a loan or a grant and it provides the government with budgetary support or balance of payments. On the other side, project food aid is given freely to support diverse development projects. Thus, there are many differences between the two types of food aid. The biggest one is that programme food aid is sold on the open market and project food aid is given to targeted groups in support of poverty reduction projects. Therefore it is easy to say that different motives underlie the gift of these two different categories of food aid and our study proves it.

Tables 4.2, 4.3 and 4.4 present respectively the results of programme, project and emergency food aid. The first thing we note is the difference between the three food aid categories. Not surprisingly, each category of food aid has it own distribution patterns. We will first illustrate specificities of each category and secondly we will compare the different results.

Table 4.2 shows, with Wald CHI2 of 286.94, 383.00 and 61.63 that our model is less powerful explaining programme food aid than total food aid. Furthermore, the mills ratio of this regression is not significant and we withdraw it. This indicates that the two stages of the double hurdles are not statistically linked. However, our estimators are still efficient (only less so than for total food aid) at predicting programme food aid distribution patterns, most variables are significant and with the expected sign.

Table 4.2 Results for Programme Food Aid Distribution Patterns, 1988-2002

Variables	Poisson	Selection			
	Random-Effects Negative Binomial	Random-Effects Probit		Random-Effects GLS	
		Coefficient	Elasticity	Coefficient	Elasticity
Recipient food supply	-0.388 (0.259)	-1.199*** (0.310)	-4.330	0.623 (0.390)	-2.628
Recipient GDP per capita	-0.587*** (0.058)	-0.783*** (0.064)	-2.829	-0.165* (0.095)	-2.290
Trade	0.254*** (0.023)	0.324*** (0.026)	1.170	0.116*** (0.041)	0.995
Recipient economic openness	-0.007 (0.063)	-0.239*** (0.071)	-0.864	-0.095 (0.102)	-0.744
Recipient respect of democratic norms	0.087 (0.079)	0.234*** (0.078)	0.845	-0.093 (0.104)	0.542
UN voting similarity	-0.743*** (0.125)	-0.729*** (0.188)	-2.634	-0.725*** (0.229)	-2.703
Distance	0.286*** (0.064)	0.031 (0.090)	0.113	-0.071 (0.130)	0.014
Recipient population	-0.335*** (0.031)	-0.367*** (0.039)	-1.324	0.150** (0.062)	-0.844
MILLS					
Number of obs	26037	26037		1387	
Number of groups	1877	1877		348	
WALD CHI2	286.94	383.00		61.63	

An important result contained in table 4.2 is that the random-effects negative binomial and the generalized least squares estimators predict that food availability in recipient countries does not influence the allocation of programme food aid. What may explain this finding is that the goal of the programme food aid is to support the recipient governments budget and help them with their balance of payments. Thus, it does not aim to alleviate hunger directly. Alternatively, we could think that because some programme food aid is sold and not given, donors target less their aid to countries with the lowest food

availability. In reality, we can conclude that both hypotheses apply and that is what explains these results.

We also note that recipient economic openness and respect of democratic norms indicators are not significant for this kind of food aid. The fact that some programme food aid is sold and thus donors target less their aid may also explain why these two variables do not have a statistical impact on food aid flow. It may be the case for recipient economic openness, but we doubt that it is a good explanation for the variable respect of democratic norms. Following project and emergency food aid analyses, we will give a better explanation on the relationship between recipient democratic commitment and food aid allocation patterns.

Finally for programme food aid, gravity equation indicators are both significant but with the opposite sign than the one predicted. More distance induces more food aid flows. It this hard to understand why and we do not have any explanation for this besides the fact that this result is not robust to the sample selection model. On the other hand, population is still negatively linked to food aid flow and with a higher elasticity. This may only mean that food aid is an efficient way for budgetary support and balance of payment in small countries. In larger countries donors may use other kinds of assistance in those situations.

Table 4.3 shows the results of project food aid regressions. When looking at this table, we instantly notice that our model predicts in a better way project food aid than programme food aid. All variables, with the exception of recipient respect of democratic norms for the Negative Binomial are significant and its Wald Chi2 is 830.70. For these

regressions we also withdraw the mills ratio because it is not significant. After doing so we obtain sample selection regressions that fit well project food aid patterns. Only the distance at the first stage and food availability and economic openness at allocation stage are not significant. Other than that, the determinants of allocation patterns of project food aid have sensibly the same orientation than the one of total aid. As for programme food aid, project food aid regressions indicate that the respect of democratic norms variable is also non significant. But, contrary to programme, the economic openness of recipient country matter for the project food aid allocation patterns.

Table 4.3 Results for Project Food Aid Distribution Patterns, 1988-2002

	Poisson	Selection			
Variables	Random-Effects Negative Binomial	Random-Effects Probit		Random-Effects GLS	
		Coefficient	Elasticity	Coefficient	Elasticity
Recipient food supply	-0.479*** (0.148)	-1.290*** (0.207)	-2.813	0.220 (0.319)	-1.775
Recipient GDP per capita	-0.373*** (0.028)	-0.485*** (0.038)	-1.058	-0.220*** (0.063)	-0.970
Trade	0.074*** (0.009)	0.088*** (0.014)	0.193	0.108*** (0.022)	0.245
Recipient economic openness	-0.186*** (0.035)	-0.309*** (0.045)	-0.674	0.082 (0.072)	-0.396
Recipient respect of democratic norms	-0.047 (0.044)	0.261*** (0.049)	0.570	-0.187** (0.080)	0.217
UN voting similarity	-1.471*** (0.090)	-1.122*** (0.150)	-2.447	-1.709*** (0.200)	-3.444
Distance	-0.348*** (0.038)	0.089 (0.062)	0.194	0.220** (0.099)	0.358
Recipient population	-0.090*** (0.016)	-0.124*** (0.025)	-0.271	0.220*** (0.037)	0.028
MILLS					
Number of obs	26037	26037		4556	
Number of groups	1877	1877		865	
WALD CHI2	830.70	659.01		347.24	

The first thing to notice in table 4.4, which presents emergency food aid results is that the model fits very well. Indeed, emergency food aid regressions have the highest Wald Chi2 of all food aid categories. Furthermore, in the elaboration of the distributional patterns of emergency food aid, policy makers seems to grant more importance to the needs as indicated by the variable recipient food supply. Indeed, the coefficient of the variable representing food availability is larger in absolute value than for any other categories of food aid and this for both decision stages. Thus, for emergency aid, donors seem to furnish more aid to countries with less availability of food. Also, emergency food aid is more directed to countries with less respect of democratic norms. This could be due to the fact that governments from donor countries give less importance to the respect of democratic norms in the case of an emergency, but those situations where emergencies happen are more common in less democratic countries.

We also note that the population variable has the expected sign for the first time in this work. This may induce the theory that states that larger countries in terms of population need more food aid simply because they have more mouths to feed is only verified for emergency food aid.

Comparing results from the three categories together we obtain interesting and robust findings. First, we noted in chapter two that Neumayer's study (2005) of the same period finds that economic interests do not impact food aid distribution patterns. These results are contrary to ours. We not only find that trades matter in one regression; according to both estimators, trades foster food aid flow, and this for all food aid categories. Indeed, our models predict that an augmentation of one percent of trades flow is associated with an

increase of .2545412 percent programme, .0740959 percent project and .1141051 percent emergency food aid. We also find that gross domestic product per capita and voting similarity at the United Nations general assembly variables are robust to all categories. For the variable recipient GDP per capita, it is not surprising. Food aid flows to less developed countries without regards to the category. However, it may be hard at this time to understand why donors constantly give more food aid to countries with which they have less affinity. With the next section, in which we break down data into different delivery modes, it will be much easier to understand this phenomenon.

Table 4.4 Results for Emergency Food Aid Distribution Patterns, 1988-2002

	Poisson	Selection			
Variables	**Random-Effects Negative Binomial**	**Random-Effects Probit**		**Random-Effects GLS**	
		Coefficient	**Elasticity**	**Coefficient**	**Elasticity**
Recipient food supply	-2.456*** (0.171)	-2.260*** (0.197)	-5.388	-1.244*** (0.364)	-5.698
Recipient GDP per capita	-0.498*** (0.034)	-0.466*** (0.037)	-1.110	-0.586*** (0.073)	-1.504
Trade	0.114*** (0.011)	0.077*** (0.013)	0.184	0.176*** (0.024)	0.328
Recipient economic openness	0.164*** (0.037)	0.147*** (0.044)	0.350	0.204** (0.082)	0.493
Recipient respect of democratic norms	0.592*** (0.058)	0.141** (0.055)	0.335	0.325*** (0.120)	0.602
UN voting similarity	-0.214* (0.119)	-0.535*** (0.144)	-1.276	-0.774*** (0.250)	-1.829
Distance	-0.242*** (0.043)	-0.153*** (0.053)	-0.364	0.150 (0.104)	-0.151
Recipient population	0.095*** (0.018)	0.171*** (0.024)	0.409	0.115*** (0.044)	0.453
MILLS					
Number of obs	26037	26037		3340	
Number of groups	1877	1877		804	
WALD CHI2	1369.62	830.04		254.69	

In the previous section on total food aid we established three possible explanations of why less economically open countries receive more food aid. Breaking down the data into different categories allows us to test those theories. First we said that the fact that concessional sales are considered as food aid might explain this situation. But, knowing that the proportion of food aid sold is categorized in programme food aid, our findings partially invalidated this theory. Partially because the Poisson family regression indicates that recipient economic openness does not matter in the elaboration of programme food aid distribution patterns, but sample selection model finds this variable significant. As we explained earlier for many reasons we consider the results from the negative binomial more reliable and that is why we consider this theory partially invalidated. Our second explanation was that if donors predicted that they would not have access to these markets, they may want to ship food aid there since it does increase the price of food in other more open markets. This theory is also challenged knowing that only in project food aid regression, recipient economic openness is significant. If this theory was to be verified, we would anticipate that programme food aid would be used to send food aid to less accessible markets and maybe project food aid but in a less efficient way since it accompanies development projects and raises more logistic issues. The third explanation we established in the previous section is that the negative sign of recipient economic openness may simply indicate that closed economies have more needs of food aid. But as we show, emergency food aid flows more to more economically open countries. If it were the fact that closed economies have more needs of food aid that explains our results, it should be the opposite; emergency food aid would have flown more to closed economies. Thus, we are missing a strong theoretical explanation of the relationship between economic openness and food aid

distribution flow. However, disaggregation of the data between the different delivery modes will again help us in explaining this relation.

In this section we showed that it is really important to break down the data of food aid into its different categories to understand well some relations. Furthermore we also illustrated and proved that programme and project food aid has different distribution patterns. Thus when disaggregating, it is important to look at those two categories separately contrary to what has been done in the literature until now. The next section will continue in the same path by breaking down data into different delivery modes of food aid. Again, we will find huge improvement of the comprehension of food aid distribution patterns.

Food Aid by Delivery Mode

The last section helped us understand some results and clarify relations between motivations underlying food aid grants and their distribution patterns. This section provides an analysis that has never been done before. We assess whether different delivery modes of food aid imply different allocation patterns. As for the last section we first explain why different delivery modes might induce different distribution patterns and verify if this is actually the case.

It is quite surprising that no previous study has ever examined food aid allocation patterns in relation with the delivery mode. Indeed, instinctively we can predict that

different delivery modes induce different patterns for many reasons. Mainly, different delivery modes imply different benefits for donors and recipients. As we noted before, food aid sent by direct transfer is often associated with tied aid. It is also the most exploited delivery mode by donor countries (OCDE, 2006). That means direct transfer food aid is constituted of food from donors' national production and thus is tied. On the contrary, triangular and locally purchased food aid implies a gift of money for food aid. For triangular transactions, donors use money to buy food in a third country and give it to the recipient. It is similar for local transactions; donors buy and give food in the recipient countries. Thus it is easy to predict that donors may be more sensible to some criteria in recipient countries when giving money abroad than when they encourage their own industry. Also commercial incentives of food aid should not apply in the same way on food delivered by direct transfer, as on food delivered by local purchases and triangular transactions. This is because there could not be any addiction developed in the recipient country to the food from the donor country and thus donors could not enhance the creation of a future market because they do not send food from their production. As we will show, different delivery modes induce different food patterns and we believe that it is mostly for the above reason.

Tables 4.5, 4.6 and 4.7 present respectively the results of direct transfer, triangular transaction and local purchase food aid regressions. We will proceed the same way we did for the differentiation of categories; by first presenting and secondly comparing each delivery mode specificities.

4.5 Results for Food Aid Distribution Patterns Delivered by Direct Transfer, 1988-2002

Variables	Poisson Random-Effects Negative Binomial	Selection			
		Random-Effects Probit		Random-Effects GLS	
		Coefficient	Elasticity	Coefficient	Elasticity
Recipient food supply	-0.746*** (0.136)	-1.797*** (0.196)	-3.572	0.261 (0.329)	-2.297
Recipient GDP per capita	-0.426*** (0.026)	-0.521*** (0.036)	-1.035	-0.511*** (0.067)	-1.252
Trade	0.131*** (0.009)	0.141*** (0.013)	0.281	0.254*** (0.024)	0.455
Recipient economic openness	-0.219*** (0.031)	-0.367*** (0.043)	-0.730	-0.081 (0.075)	-0.603
Recipient respect of democratic norms	0.244*** (0.042)	0.348*** (0.047)	0.692	-0.061 (0.085)	0.435
UN voting similarity	-1.520*** (0.080)	-0.686*** (0.146)	-1.363	-1.405*** (0.198)	-2.382
Distance	-0.142*** (0.033)	-0.090 (0.055)	-0.179	0.073 (0.106)	-0.055
Recipient population	-0.169*** (0.014)	-0.168*** (0.023)	-0.333	0.004 (0.042)	-0.234
MILLS					
Number of obs	26037	26037		5208	
Number of groups	1877	1877		993	
WALD CHI2	1325.77	889.56		285.42	

Table 4.5 shows a really good fit of the model for the random-effects negative binomial with a Wald Chi2 of 1325.77 and all significant variables. Double hurdles model fits well but not as it does for the Poisson family regression. Mostly the allocation stage has only three significant variables: voting similarity at the United Nations General Assembly, trade between donor and recipient and gross domestic product per capita of recipient country. Also, mills ratio is not significant for this regression and that is why we withdraw it from the equation. Now let us look at the effect of the different variables.

The first thing we notice is that direct transfer regressions give support to the theory that link transportation cost to the fact that donors tend to give more food aid to nearby countries. Indeed, there are more direct transfer transactions between close countries and it may represent the transportation cost of food aid. However this finding does not challenge other explanation of the situation given in chapter three. The unfamiliarity effects of distance as theorized by Huang (2007) and the possibility to gain regional influence for donors (Neumayer, 2005) may also matter in this food aid practice. Thus, to confirm or invalidate any of the previous theory we will need to look at the two other kinds of delivery mode. It also worth noticing that food aid seems also to flow more to less populous countries when delivered by direct transfer. Let us keep the explanation of this relation at the end of the present section. Also, table 4.5 shows that economic openness and political affinity variables are negative. It is important to keep those findings in mind until the discussion at the end of this section.

As we notice in table 4.6 our model again fits well with a Wald Chi2 of 1009.90. All variables are significant, with the exception of recipient economic openness. Also, the sample selection model fits a little bit less well than the Poisson model. However, both estimators predict the same sign for each variable when significant. This, as we said, indicates robust findings.

4.6 Results for Food Aid Distribution Patterns Delivered by Triangular Transfer, 1988-2002

Variables	Poisson	Selection			
	Random-Effects Negative Binomial	Random-Effects Probit		Random-Effects GLS	
		Coefficient	Elasticity	Coefficient	Elasticity
Recipient food supply	-1.839*** (0.201)	-1.750*** (0.206)	-4.505	-0.876** (0.380)	-4.681
Recipient GDP per capita	-0.601*** (0.039)	-0.479*** (0.039)	-1.234	-0.425*** (0.076)	-1.468
Trade	0.190*** (0.013)	0.084*** (0.014)	0.215	0.121*** (0.024)	0.303
Recipient economic openness	0.036 (0.043)	0.064 (0.046)	0.165	-0.075 (0.085)	0.064
Recipient respect of democratic norms	0.458*** (0.068)	0.205*** (0.057)	0.527	0.274** (0.117)	0.720
UN voting similarity	1.698*** (0.211)	0.200 (0.173)	0.515	1.657*** (0.362)	2.091
Distance	0.149*** (0.055)	0.005 (0.056)	0.012	0.274** (0.114)	0.284
Recipient population	-0.090*** (0.021)	0.045* (0.024)	0.116	0.036 (0.042)	0.135
MILLS					
Number of obs	26037	26037		2449	
Number of groups	1877	1877		661	
WALD CHI2	1009.90	622.94		160.80	

Results of triangular transaction food regressions also tend to support that transportation cost of food aid matters and explains why donors give to close countries. We can interpret results by saying that donors give more aid by direct transfer to countries geographically close to them and use more triangular transactions for their aid to countries far from them.

Another interesting fact about this desegregation is that political ties seem to influence positively the allocation stage of local and triangular purchase contrary to direct transfer. Indeed, we find that an increase of one percent of the voting similarity is associated with an augmentation of 1.698358 percent of triangular transactions. This result is robust to the two different estimators. Since direct transfer is often done with grains from the donor country and thus is tied, we may interpret this by assuming that when donors give food from their own production they are less fussy about whether they are helping a friendly country because in fact they are helping their own economy. But on the other hand, if they buy the aid on a foreign market, it is to help a country with which they have political affinity.

As indicated by table 4.7, the random-effects negative binomial better fits than the double hurdles model with a Wald Chi2 of 780.17 compared to 495.02 and 118.40. However, in this regression we include the mills ratio because it is significant. Thus the two stages are statistically linked.

To begin with, we notice that both variables of the gravity equation are significant and with the expected signs. This induces two things. First, it tempers findings of the theory that links the costs of transport to distance. If this theory was validated, donors should give more aid by direct transfer to countries geographically close to them and use more local purchase and triangular transactions for their grants to countries far from them. Our results indicate that it is only the case for triangular purchase. This may indicate that not only transportation cost explains why donors give food aid to countries close to them. Indeed, it supports the arguments of Neumayer (2005) and Huang (2007), respectively that donors

want to have a regional influence and that distance creates unfamiliarity effects that may have a profound impact on the exports of uncertainty-averse countries to distant destinations. Also, table 4.7 shows that an augmentation of one percent of the population is associated with an augmentation of .2188471 percent of local purchase food aid. This may simply indicate that it is easier to have locally purchased food aid in larger countries as hypothesis 1a predicted.

4.7 Results for Food Aid Distribution Patterns Delivered by Local Purchase, 1988-2002

Variables	Poisson	Selection			
	Random-Effects Negative Binomial	Random-Effects Probit		Random-Effects GLS	
		Coefficient	Elasticity	Coefficient	Elasticity
Recipient food supply	-1.877*** (0.235)	-1.645*** (0.226)	-4.605	-8.370** (3.599)	-12.278
Recipient GDP per capita	-0.701*** (0.046)	-0.427*** (0.043)	-1.196	-2.482*** (0.939)	-3.497
Trade	0.083*** (0.015)	0.038** (0.015)	0.108	0.227*** (0.088)	0.318
Recipient economic openness	0.281*** (0.053)	0.280*** (0.050)	0.784	1.577** (0.617)	2.243
Recipient respect of democratic norms	-0.403*** (0.073)	-0.151** (0.062)	-0.424	-0.729** (0.337)	-1.089
UN voting similarity	0.129 (0.228)	-0.268 (0.190)	-0.752	-1.471** (0.737)	-2.109
Distance	-0.381*** (0.067)	0.012 (0.061)	0.034	0.232 (0.150)	0.261
Recipient population	0.218*** (0.026)	0.260*** (0.028)	0.728	1.522*** (0.568)	2.140
MILLS				5.542** (2.510)	
Number of obs	26037	26037		1920	
Number of groups	1877	1877		563	
WALD CHI2	780.17	495.02		118.40	

We also note that recipient economic openness positively influences the flow of local purchase food aid. In tables 4.5 and 4.6, we illustrate that recipient economic openness was negative for direct transfer transaction and non significant but positive for triangular transaction. That allows us to make a similar argument for political affinity. Indeed, donor countries may be less particular if they give to closed countries when it comes from their own production, but when they buy the aid, they want to give it to more open countries. If we look at the result of UN voting similarity for local purchase we confirm this theory for political affinity.

Let us now compare the food aid distribution patterns of the three different delivery modes. First, it is important to note that food supply for human consumption, gross domestic production per capita, trades between recipient and donor, are robust to all different delivery modes.

Also, we find that countries with better respect of democratic norms receive more food aid by local purchase. Looking back at table 4.2 to 4.4, we see that only emergency food aid seems to flow more to countries with bad respect of democratic norms. This may indicate that countries with worse respect of democratic norms are more susceptible to having problems with their food supply chain and may need more food aid. The fact that only local purchase food aid goes to countries with better respect of democratic norms supports this claim. Countries with good respect of democratic norms have a better food supply chain since donor countries are able to buy food in recipient countries. Also, previous literature stated that democracy prevents famines (D'Souza, 1994; Sen, 1994 and 1999). Indeed, Sen advocates that « gross disadvantage such as widespread death from lack

of food would not be allowed by a democratic government in which the press can and probably would make an issue of immense public concern» (D'Souza, 1994, p. 369). The present results may confirm this theory, but we will gain a better understanding of this relation when looking to the different indicators of governance in chapter five. For now, we will interpret these results by saying that countries with bad respect of democratic norms are more prone to having problems with their food supply chain and may need more food aid.

Finally, regressions on all food aid categories and delivery modes found the variable population mostly negative, with two exceptions; emergency and local purchase food aid. These results contradict what we predicted. However, the disaggregations of food aid help us to theorize about this phenomenon. Indeed, the fact that smaller population seems to induce more food aid flows of all categories with the exception of emergency and locally purchased food aid allows us to hypothesize that in most situations needs are regionalize or affect only some part of the population and that in larger countries other people of the same country may be able to help their own fellows, but in smaller countries it is not the case. Before claiming for international assistance, countries would try to solve the situation by their own and it is easier to do so for larger countries. When larger countries cannot fully help their compatriot, as in emergency situations, they ask for international food aid grants. This is verified by the fact that there is more locally purchased food aid in larger countries. It indicates that it is easier in larger countries to purchase and distribute food aid in the same country. Thus if a country has more people that can help their fellows, there will be less needs for food aid from international donors.

This section allowed us to gain a better understanding of some food aid practices. At first, we had trouble explaining why a donor country would give more to countries with less political affinity. It was counterintuitive. But breaking down data between different delivery modes give us the results that we needed to understand how it was possible. When donors give food from their surplus, they are less particular about which country they are sending it to because it benefits them already. This is an important finding, because it shows that some food aid is still tied with agricultural surplus and that donor's act differently in those cases. Studying food aid distribution patterns in relation to their delivery modes is a first time occurrence, but should always be done to avoid misinterpretation. We learn much more by doing so.

Summary of Findings

This chapter presented many original findings and proposed a new methodology to assess food aid distribution patterns. Indeed, we advocate that it is very important to break down data into its different categories and delivery modes to avoid misinterpretation. This is really the cornerstone of this thesis. The results showed us that we were right. We gain a lot more information with these disaggregations than previous studies on food aid distribution patterns. We will now present a brief recapitulation of those findings. First, let us start with the two variables that were robust to all food aid categories, delivery modes and for both estimators; gross domestic product per capita and trades between recipient and donor. The developmental indicator, recipient GDP per capita, and the economic interests indicator, trade, have constantly been found respectively negative and positive. Gravity

model has been verified entirely in only two regressions. Indeed, it seems that distance and population were mostly negative. We predicted this relation for distance between recipient and donor and food aid distribution patterns, but it is contrary to what we expected for recipient country population. Food aid flows to smaller countries, contrary to trade, with the exception of emergency and local purchase food aid. The variable recipient food supply measuring food availability for human consumption in recipient countries has been constantly negative as predicted with the exception of programme food aid. The recipient respect of democratic norms indicator has had mixed results. Mostly, results of emergency and local purchase food aid that found recipient respect of democratic norms respectively negative and positive were important. The aspect of good governance represented by this variable, the democratic commitment, seems to be a needs indicator. Recipient countries with better respect of democratic norms would have less needs of food aid because they manage in a better way their food supply chain. Furthermore, when needed, food aid can be bought in another part of the recipient country. Finally, we found that the economic openness variable, recipient economic openness and the political interests variable, UN voting similarity matter only in the case where the donor needs to buy the food that he gives. In these cases, food aid flows more to economically open countries and to countries with similar political ties. We believe that these results augment greatly the scientific knowledge about the food aid distribution patterns and how to evaluate it. In the next chapter we will apply our technique of disaggregation to a most controversial aspect of the study of official development assistance, good governance.

CHAPTER 5: Further Investigation

This chapter will augment the present research in three ways. To begin with, we will attack a huge puzzle of the scientific debate about official development assistance, good governance. Since the 1990s, there has been a large debate about the relation that entertains good governance with aid (e.g: Dalgaard et al, 2004; Hansen and Tarp, 2000, 2001; Dalgaard and Hansen, 2001; Easterly, Levine and Roodman, 2003; Dayton-Johnson and Hoddinott, 2001, 2003; Guillaumont and Chauvet, 2001; Lensink and White, 2001; Knack, 2001; Neumayer, 2003; Burnside and Dollar, 2000). However, little has been done regarding food aid and governance. In the last chapter we looked at the impact of democratic commitment on food aid distribution patterns, but could not investigate other dimensions of good governance, mainly because of econometric issues (multicollinearity). In this chapter we will look more broadly at this relation. But first, we will begin this chapter by evaluating if food aid distribution patterns have been constant in our analysis period. We do so for two reasons. First there are many theoretical reasons that support the idea of a structural change after the mid 1990s in food aid distribution patterns. Secondly, due to availability constraints of some variables the section on governance and food aid will have a different horizon than in chapter four: 1996-2002. Thus we will break data into two periods 1988-1995 and 1996-2002. The purpose of these regressions is to test for structural change and not investigate each period thoroughly. Thus, due to space availability and the aim of this work, we will not break down the data into different categories and delivery modes for both periods. Finally, at the end of this chapter we will also analyze each donor's program separately. Indeed we will investigate if the factors

conditioning the volume of food aid sent to potential recipient countries vary across donors. Obviously, we cannot present a deep analysis of each program. Doing so would require too much space for what we aim. Therefore, we will only try to underline the major differences between each donor allocation patterns. But first, we begin this chapter by explaining why food aid distribution patterns may have changed in the mid 1990s.

Did Food Aid Patterns Change During the 1990s?

Our analysis accounts for 15 years and many changes occurred during those years in international relations. Food aid distributional patterns may have also been reshaped. Principally, in the mid 1990s, the United States of America and the European Community claimed to reform their respective food aid program to better respond to the recipients' needs. In their 1997 report, the *United States Agency for International Development* (USAID), one of the departments responsible for American food aid policy, stated «that PL 480 title II has become a more-tightly focused program, with a coherent set of development-oriented food security objectives, increasingly directed to the most food insecure and disadvantaged population groups. The impact of the transformation of Title II on food security and malnutrition will become more easily measurable in future years» (USAID, 1998, as quoted in by Young and Abbott, 2008, p. 30). The European Community went further by implementing a new status for their food aid program called regulation 1292/96, in 1996. This new legislation aimed to end the relation between agricultural surplus and food aid to become more respectful of recipient needs (Abbott and Young, 2004; Young and Abbott, 2008). These two changes in the largest bilateral food aid

programs lead us to believe that in the second half of the studied period the food aid allocation patterns are reformed. Furthermore, the European Union has advocated for increased discipline for food aid in the WTO debates of the Doha Round (Abbott and Young, 2004; Young and Abbott, 2008). Inasmuch as all donors are members of the WTO, this suggests that modifications in the philosophy underlying the elaboration of food aid distributional patterns may apply to all donors. Young and Abbott (2008) also state that the augmentation of demand due to an increase in emergency where food aid is needed, and the diminution of supply may also affect food aid regimes.

Comparing tables 5.1 and 5.2, that present regressions of food aid allocation patterns for the two periods, 1988-1995 and 1996-2002, allows us to identify the differences between both periods. Let us start with the fit of the model. With Wald Chi2 respectively of 1122.37 and 1298.47 for the negative binomial, and all variables significant with the exception of the recipient respect of democratic norms for the second period, we observe that the model fits quite well both periods.

Comparing both periods, we find that most variables influence in the same way and with approximately the same quantitative effect the food aid distribution patterns during the two periods. However, three differences can be observed between the two periods. First, for the premier portion of our study the democratic commitment of the recipient country seems to influence negatively the food aid allocation patterns with a confidence interval of 90%, but the relation is not significant in the second period. Secondly, in the first half of the 1990s, economic openness and smaller population of recipient countries increase food aid flow, but the relation is reversed for the second half of the decade. Thirdly, the sign of the

Table 5.1 Results for Total Food Aid Distribution Patterns, 1988-1995

Variables	R-E.N.B.	Random-Effects Probit		Random-Effects GLS	
		Coefficient	Elasticity	Coefficient	Elasticity
Recipient food supply	-1.306*** (0.151)	-2.337*** (0.271)	-3.761	-2.431*** (0.724)	-4.560
Recipient GDP per capita	-0.584*** (0.030)	-0.793*** (0.050)	-1.277	-1.594*** (0.222)	-2.317
Trade	0.191*** (0.010)	0.189*** (0.018)	0.305	0.412*** (0.054)	0.585
Recipient economic openness	0.142*** (0.034)	0.084 (0.059)	0.135	0.305*** (0.092)	0.382
Recipient respect of democratic norms	0.086* (0.047)	0.032 (0.063)	0.052	-0.128 (0.093)	-0.099
UN voting similarity	-0.762*** (0.107)	-0.807*** (0.200)	-1.299	-1.808*** (0.339)	-2.543
Distance	-0.087** (0.039)	-0.028 (0.069)	-0.045	0.316*** (0.120)	0.290
Recipient population	-0.096*** (0.016)	-0.016 (0.030)	-0.026	0.102** (0.046)	0.087
MILLS				1.637*** (0.395)	
Number of obs/groups	13132/1876	13132/1876		4303/1018	
WALD CHI2	1122.37	744.70		258.14	

Table 5.2 Results for Total Food Aid Distribution Patterns, 1996-2002

Variables	R-E. N.B	Random-Effects Probit		Random-Effects GLS	
		Coefficient	Elasticity	Coefficient	Elasticity
Recipient food supply	-1.220*** (0.199)	-2.091*** (0.278)	-3.818	-0.325 (0.401)	-3.049
Recipient GDP per capita	-0.633*** (0.037)	-0.623*** (0.049)	-1.137	-0.467 (0.078)	-1.279
Trade	0.045*** (0.012)	0.059*** (0.017)	0.108	0.212 (0.025)	0.289
Recipient economic openness	-0.090** (0.046)	-0.222*** (0.070)	-0.406	0.025 (0.101)	-0.264
Recipient respect of democratic norms	0.013 (0.059)	0.188** (0.078)	0.344	0.120 (0.128)	0.366
UN voting similarity	-2.217*** (0.127)	-2.007*** (0.211)	-3.665	-1.819 (0.245)	-4.434
Distance	-0.225*** (0.044)	-0.134** (0.062)	-0.245	0.455 (0.104)	0.280
Recipient population	0.057*** (0.020)	0.047 (0.030)	0.086	0.062 (0.045)	0.123
Number of obs/groups	12905/1877	12905/1877		3064/899	
WALD CHI2	1298.47	813.88		289.33	

variable population changes in the second period to become positive. These findings are trivial since when we decompose food aid into its different categories we find mostly the same results that we found in chapter four for recipient respect of democratic norms, recipient economic openness and population in the two periods. Donors give food aid to countries with less commitment to democratic norms only in the case of emergency food aid. Food aid also flows to less open countries when coming from the donors own production, but not when donors buy the food aid in another country. The variable population is significant and positive only for emergency and locally purchased food aid, and negative or non significant for all other categories. Thus, we also find some change in the patterns in the 90s as Young and Abbott (2008) found. But, we do not find as Young and Abbott (2008) any sign that donors were more influenced by needs when they developed their food aid distributional patterns in the second half of the 90s. Indeed, an augmentation of one percent of food availability in the recipient country is associated with a decrease of 1.305574 percent during the first period and 1.220002 percent during the second one.

Desegregation into two periods showed us that our findings are mostly robust for both periods with some little exception. In the next section we will deepen our analysis of food aid practice by patterns by using our econometric model to investigate the relation between different aspects of good governance for the period 1996-2002.

Governance and Food Aid

This section will provide a deeper analysis of the impact of good governance in potential recipient countries on food aid distributional patterns. We will augment the findings of last chapter in which we used the variable recipient respect of democratic norms as a governance indicator. At first we had included other variables representing different dimensions of governance in the main analysis, but test of multicollinearity showed it was impossible to do so without including a bias in the study. Therefore we will use the World Governance Indicators (WGI), a risk indicator from PRS group, two human right variables from the CIRI project and we will breakdown the variable recipient respect of democratic norms into its two components, civil liberties and political rights to test the robustness of the previous results and at the same time assess if all different dimensions of governance influence in the same way. In the first portion we will explain which variable we chose and why, to secondly present regression of total food aid on these indicators and finish by doing the same disaggregation as in chapter four.

First, we rely on the variable risk, originally used in the analysis of the potential risks to international business operations to assess the economic or business dimension of good governance. This variable is a weighted average of political risk (50%), financial risk (25%) and economic risk (25%). It is used as an indicator of good governance as perceived by the business sector. Indeed, it is a proxy to evaluate different aspects of business good governance like corruption, government stability, internal and external conflicts, bureaucratic quality, current account imbalances, budget imbalances, foreign debt and net

international liquidity. In appendix 3, there is an explanation of how risk is constructed. As we wrote in chapter two, donors sometime give to promote their trades of agriculture goods (Cathie, 1997). Therefore we my think that donors will consider the same indicator that business sector use. Furthermore, this indicator include many dimensions of governance that share the characteristic of enhancing the security of investment thus this variable may represent a more global picture than other variables. We did not use this variable in the main analysis because risk is not available for many less developed countries. Risk is expressed as a percentage and the higher the score the better the governance. This variable was purchased from PRS group.

Secondly, we used two indicators from the Cingranelli-Richards (CIRI) human rights project to assess aspects of good governance linked to the respect of human rights in possible recipient countries, the Physical Integrity Rights index (Recipient respect of physical integrity) and the empowerment index (Recipient respect of empowerment). Recipient respect of physical integrity represents the recipient government respect for four rights: Torture, Extrajudicial Killing, Political Imprisonment, and Disappearance indicators. This variable represents an aspect of good governance that is completely different from the one studied until now in this thesis and hence will augment our study. Recipient respect of empowerment is constructed from the respect of the recipient government for the freedom of movement, freedom of speech, workers' rights, political participation and freedom of religion. This variable represents a good robustness test for the civil liberties variable of the freedom house. We expect a positive sign for both variables.

Table 5.3 Definitions of Worldwide Governance Indicators

Indicator	Definition
Voice and Accountability	The extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association and a free media.
Political Stability and Absence of Violence	The likelihood that the government will be destabilized by unconstitutional or violent means, including terrorism.
Government Effectiveness	The quality of public services, the capacity of the civil service and its independence from political pressures; and the quality of policy formulation.
Regulatory Quality	The ability of the government to provide sound policies and regulations that enable and promote private sector development.
Rule of Law	The extent to which agents have confidence in and abide by the rules of society, including the quality of contract enforcement and property rights, the police, and the courts, as well as the likelihood of crime and violence.
Control of Corruption	The extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as capture of the state by elites and private interests.

Source: Governance Matters 2009, World Bank Institute

Thirdly, the *World Bank* has constructed six different indicators to assess the different governance dimensions. This dataset is based on 35 data sources from 33 organizations around the world. A definition for each World Governance Indicator (WGI) is given in Table 5.3. Those data have been used in Nunnenkamp and Thiele (2006) in an analysis on Official Development Assistance.

To summarize, we have indicators from three sources: PSR group from the business sector; the Cingranelli-Richards (CIRI) human rights project for human rights indicators; and the *World Bank*, which is an international organization and a donor. Indeed, we will test these indicators to gain a better understanding of the relationship between good governance of potential recipient countries and food aid allocation patterns. It is particularly interesting to do so because we have three visions of good governance represented in our study; from the business sector, from a human rights perspective and from an international organization. Also, it is important to note that the governance indicators are slightly correlated with the variable recipient food supply and highly linked one to the others. Thus, in order to avoid multicollinearity, each indicator may only be tested individually. Therefore we cannot evaluate the other dimensions of governance. This could also imply, in some way, that these indicators represent a proxy variable for the needs of recipients. Following this, we may suspect that the coefficients of the variables are lower in absolute terms than what they would really be if we could control perfectly every aspect of the needs. We must also withdraw the previous variable representing good governance.

Total Food Aid

Table 5.4 shows results of the regression of the different governance indicators on total food aid. The first thing we note is that the majority of significant variables indicate that food aid flows more to country with better governance, and this, expressed into different forms. Indeed, we find here that recipient respect of empowerment, risk, regulatory quality, government effectiveness, voice and accountability, political stability and absence of violence and rule of law influence positively flow of food aid. It is important to note that most of these results are not robust to the sample selection model. In fact, only government empowerment (Recipient respect of empowerment), regulatory quality and government effectiveness of recipient country are robust. Both, disaggregation will give us more robust results. This is another example of why it may be important to break down data. By doing so, we obtain more robust and reliable findings. Those results are contrary to the one of Fariss (2007) that states that for some donors non-respect of human rights increases the likelihood of food aid because they are legally bound to give other types of aid.

Also, World Governance Indicators seems to indicate that donors prefer giving food aid to country that are better to manage it. Indeed, regulatory quality and government effectiveness that measure «the ability of the government to provide sound policies and regulations that enable and promote private sector development» and « the quality of public services, the capacity of the civil service and its independence from political pressures; and the quality of policy formulation» are found to have a larger positive influence on food aid

flows than other WGI. Furthermore, these measure of the ability of government to produce public service and good economic policies are robust to both estimator. However, before analyzing more these results we will wait until the disaggregation of food aid into its different categories and delivery modes.

Table 5.4 Results of Governance Indicators for Total Food Aid

Variables	Poisson	Selection			
	Random-Effects Negative Binomial	Random-Effects Probit		Random-Effects GLS	
		Coefficient	Elasticity	Coefficient	Elasticity
Recipient respect of democratic norms	0.013 (0.059)	0.188** (0.078)	0.344	0.120 (0.128)	0.366
Recipient respect of civil liberties	0.087 (0.072)	0.256*** (0.093)	0.491	0.108 (0.155)	0.463
Recipient respect of political rights	-0.010 (0.044)	0.120** (0.057)	0.229	0.090 (0.092)	0.255
Recipient respect of empowerment	0.196*** (0.040)	0.130** (0.059)	0.249	-0.180** (0.089)	0.005
Recipient respect of physical integrity	-0.042 (0.044)	0.042 (0.051)	0.080	-0.141** (0.070)	-0.082
Risk in recipient country	0.458*** (0.164)	-0.193 (0.240)	-0.352	-0.641** (0.321)	-0.901
Control of Corruption	0.037 (0.077)	0.014 (0.110)	0.028	-0.239 (0.148)	-0.219
Regulatory Quality	0.236*** (0.044)	0.282*** (0.059)	0.544	-0.182 (0.086)	0.212
Government Effectiveness	0.360*** (0.089)	0.255** (0.121)	0.489	-0.019 (0.170)	0.336
Voice and Accountability	0.195*** (0.057)	0.099 (0.084)	0.190	-0.198 (0.122)	-0.061
Political Stability & Absence of Violence	0.090*** (0.034)	0.0145 (0.050)	0.028	0.001 (0.065)	0.020
Rule of Law	0.112* (0.067)	0.035 (0.102)	0.068	0.119 (0.142)	0.168

We also find that corrupted governments do not receive less food aid. This corroborates and adds to the findings of Alesina and Weder (2002). Indeed, they found that Official Development Assistance did not go more to less corrupted government during the period 1975-1994.

As we just said, good governance in form of business predictability brings more food aid to potential recipient countries. This indicator seems to have the highest quantitative impact on food aid flow; an augmentation of one percent of Risk is associated with a decrease of .4580805 percent of food aid. This may indicate that government considers food aid as a form of investment. Therefore more risk in the recipient country induces less food aid. It will be really interesting to see if the influence of the variable LNRISK varies across food aid categories.

Food Aid by Category

We now turn to food aid by category. In chapter four, we demonstrated that this type of disaggregation greatly helps understanding diverse aspects of food aid allocation patterns. Again, this section shows the importance of breaking down the data on food aid. As we did in the last chapter; we will first illustrate each category's specificities, and secondly, we will directly compare the three different categories of food aid.

Table 5.5 Results of Governance Indicators for Programme food Aid

Variables	R-E.N.B.	Random-Effects Probit		Random-Effects GLS	
		Coefficient	Elasticity	Coefficient	Elasticity
Recipient respect of democratic norms	-0.205 (0.150)	0.106 (0.154)	0.431	-0.182 (0.206)	0.140
Recipient respect of civil liberties	-0.223 (0.194)	0.204 (0.188)	0.830	-0.123 (0.264)	0.499
Recipient respect of political rights	-0.130 (0.107)	0.045 (0.111)	0.182	-0.159 (0.142)	-0.022
Recipient respect of empowerment	0.104 (0.116)	-0.070 (0.109)	-0.278	-0.230 (0.140)	-0.441
Recipient respect of physical integrity	-0.013 (0.115)	-0.036 (0.097)	-0.144	-0.117 (0.121)	-0.228
Risk in recipient country	0.465 (0.543)	0.129 (0.465)	0.505	-1.338** (0.682)	-0.946
Control of Corruption	0.697*** (0.177)	0.180 (0.203)	0.733	-0.190 (0.238)	0.360
Regulatory Quality	0.652*** (0.164)	0.184 (0.114)	0.741	-0.308 (0.145)	0.254
Government Effectiveness	1.550*** (0.256)	0.770*** (0.232)	3.123	-0.013 (0.280)	2.356
Voice and Accountability	0.725*** (0.159)	0.382*** (0.166)	1.550	-0.222 (0.207)	0.947
Political Stability & Absence of Violence	0.398*** (0.111)	0.173* (0.095)	0.694	0.020 (0.126)	0.547
Rule of Law	0.909*** (0.203)	0.504*** (0.190)	2.043	0.472* (0.260)	2.020

Table 5.6 Results of Governance Indicators for Project Food Aid

Variables	R-E.N.B.	Random-Effects Probit		Random-Effects GLS	
		Coefficient	Elasticity	Coefficient	Elasticity
Recipient respect of democratic norms	-0.309*** (0.080)	-0.182* (0.094)	-0.4711	-0.138 (0.149)	-0.480
Recipient respect of civil liberties	-0.33*** (0.097)	-0.181 (0.112)	-0.470	-0.284 (0.182)	-0.625
Recipient respect of political rights	-0.226*** (0.059)	-0.118* (0.069)	-0.306	-0.055 (0.108)	-0.278
Recipient respect of empowerment	0.619*** (0.060)	0.368*** (0.076)	0.963	0.044 (0.125)	0.761
Recipient respect of physical integrity	0.277*** (0.057)	0.211*** (0.061)	0.545	0.154 (0.098)	0.556
Risk in recipient country	1.726*** (0.282)	1.344*** (0.302)	3.448	0.846* (0.506)	3.377
Control of Corruption	0.652*** (0.130)	0.676*** (0.142)	1.806	-0.091 (0.236)	1.229
Regulatory Quality	1.388*** (0.092)	0.998*** (0.102)	2.656	0.147 (0.168)	2.133
Government Effectiveness	1.356*** (0.150)	1.299*** (0.159)	3.429	0.192 (0.274)	2.741
Voice and Accountability	0.716*** (0.0880315)	0.688*** (0.107)	1.815	0.145 (0.159)	1.482
Political Stability & Absence of Violence	0.421*** (0.059)	0.291*** (0.064)	0.761	0.175* (0.103)	0.733
Rule of Law	0.682*** (0.113)	0.666*** (0.130)	1.770	0.255 (0.205)	1.549

Table 5.7 Results of Governance Indicators for Emergency Food Aid

Variables	R-E.N.B.	Random-Effects Probit		Random-Effects GLS	
		Coefficient	Elasticity	Coefficient	Elasticity
Recipient respect of democratic norms	0.829*** (0.074)	0.565*** (0.092)	1.455	0.682*** (0.165)	1.843
Recipient respect of civil liberties	1.150*** (0.110)	0.742*** (0.112)	1.925	0.692*** (0.202)	2.231
Recipient respect of political rights	0.644*** (0.067)	0.371*** (0.068)	0.951	0.541*** (0.123)	1.299
Recipient respect of empowerment	-0.210*** (0.049)	-0.039 (0.065)	-0.099	-0.306*** (0.103)	-0.385
Recipient respect of physical integrity	-0.302*** (0.057)	-0.150*** (0.056)	-0.375	-0.240*** (0.087)	-0.541
Risk in recipient country	-1.503*** (0.202)	-1.164*** (0.252)	-2.92	-1.163*** (0.356)	-3.515
Control of Corruption	-0.581 (0.089)	-0.55 (0.116)	-1.413	-0.545 (0.173)	-1.656
Regulatory Quality	-0.084** (0.0393159)	-0.111* (0.057)	-0.286	-0.311*** (0.093)	-0.535
Government Effectiveness	-0.807*** (0.109)	-0.606*** (0.131)	-1.546	-0.542*** (0.188)	-1.757
Voice and Accountability	-0.618*** (0.071)	-0.451*** (0.090)	-1.145	-0.662*** (0.136)	-1.565
Political Stability & Absence of Violence	-0.266*** (0.039)	-0.237*** (0.051)	-0.606	-0.124* (0.069)	-0.604
Rule of Law	-0.649*** (0.081)	-0.734*** (0.109)	-1.874	-0.202 (0.158)	-1.677

Comparing tables 5.5, 5.6, and 5.7 gives us interesting findings. In general, we notice that food aid seems to flow more to countries with good governance for programme and project food aid and inversely for emergency food aid. Also, besides regressions on emergency food aid, the selection model does not seem to perform well. Indeed, most governance indicators are not significant in the double hurdles model. However, when significant in regression on project and programme food aid, it is mostly at the first stage. It seems that good governance influence more the choice of the recipient countries than the amount sent.

As table 5.5 shows, recipient respect of democratic norms, recipient respect of civil liberties, recipient respect of political rights, recipient respect of empowerment, recipient respect of physical integrity and risk are not significant in the case of programme food aid. Since programme food aid is usually given on a government-to-government basis, it is quite encouraging to notice that countries with better control of corruption receive more of this type of aid. A one percent augmentation on the worldwide governance indicator of control of corruption is associated to an increase of .6975391 percent of food aid flows. Furthermore, donors give more food aid to countries with better regulatory quality, government effectiveness, accountability, stability and respect of rule of law. Since some programme food aid is sold, we would have anticipated that if donors consider the business indicator risk it would have be when selling food aid. However, it is not the case here. risk is positive, but not significant.

On the contrary, for project food aid, all dimensions of good governance measured in this study bring more aid to potential recipients. Indeed, all indicators are significant and with the expected sign. Linking those findings with the ones of Dollar and Burnside (1998), who find that gift of Official Development Assistance is a waste of resource in countries with bad governance, is really interesting. Project aid aims at poverty reduction, thus it is possible to conclude that donors are more attuned to governance in the recipient country when they give for development. Furthermore, we notice that the elasticity of the variable risk of project food aid is three times larger than the one of programme food aid and larger than any other elasticity of governance indicators. Indeed, an increase of one percent of risk in the recipient country is associated with a decrease of 1.726521 percent of project food

aid. That may indicate that, donors consider food aid as an investment as we said in the last section, but only in the case of project food aid.

Also, all good governance significant variables have the opposite sign as the one expected for emergency food aid. Thus bad governance seems to attract emergency food aid. We interpret this by assuming that bad governance enhances the need of emergency food aid. Indeed, as we said in chapter four when analyzing food aid categories, we may explain why emergency food aid flows more to countries with bad governance, by the fact that governments from donor countries give less importance to governance in the case of an emergency, but those situations where emergencies happen are more common in countries with worse governance. Results of the different delivery modes in the same chapter and the present findings illustrate this claim. All governance indicators, and this with both estimators, indicated that emergency food aid flows more to countries with bad governance.

Breaking down the data into the different categories leads us to also temper our previous findings about the link between corruption and food aid patterns. It seems food aid flows more to countries with better control of corruption. Emergency food aid is a completely different situation where food aid flows in a larger volume to corrupted governments, but it is interpreted here as said earlier that bad governance enhances the needs of emergency food aid. These results contradict the previous finding for official development assistance of Alesina and Weder (2002).

This section offers a second illustration of the importance of breaking down data into the different categories of food aid. Findings about control of corruption are a good

example. Before the disaggregation we found that donors seem to not consider corruption in the recipient country when allocating it food aid. Some could have condemned donor countries for doing so. However, regressions of corruption variables on the different categories of food aid indicate that donors give more aid to countries with better control of corruption in all cases with the exception of emergency food aid. This finding tempers the result about how donors consider recipients with less control of corruption. It is easy to find arguments of why a government should not give food aid when aiming at development, but it may be harder in emergency situations. Again, the technique for evaluating donor food aid allocation patterns developed in this work avoids misinterpretation. Next, we turn to the analyses of the different governance indicators in relation with the different delivery modes.

Food Aid by Delivery Mode

In this section we test the impact of governance indicators according to the delivery mode of aid and find many interesting facts. Tables 5.8, 5.9 and 5.10 show results of the regression of the different governance indicators on direct transfer, triangular transaction and local purchase food aid. Again, results are stunning. We confirm previous results and obtain some original ones.

Table 5.8 Results of Governance Indicators for Direct Transfer Food Aid

Variables	R-E.N.B.	Random-Effects Probit		Random-Effects GLS	
		Coefficient	Elasticity	Coefficient	Elasticity
Recipient respect of democratic norms	0.198*** (0.076)	0.231*** (0.086)	0.549	0.223 (0.168)	0.633
Recipient respect of civil liberties	0.312*** (0.094)	0.317*** (0.103)	0.753	0.248 (0.206)	0.812
Recipient respect of political rights	0.118** (0.057)	0.146** (0.063)	0.346	0.153 (0.121)	0.411
Recipient respect of empowerment	0.070 (0.051)	0.027 (0.062)	0.063	-0.233** (0.117)	-0.1845
Recipient respect of physical integrity	-0.082 (0.051)	-0.027 (0.057)	-0.064	-0.114 (0.094)	-0.163
Risk in recipient country	0.004 (0.202)	-0.435* (0.261)	-0.982	-0.379 (0.428)	-1.114
Control of Corruption	-0.345*** (0.103)	-0.107 (0.120)	-0.259	-0.397 (0.191)**	-0.588
Regulatory Quality	0.242*** (0.052)	0.273*** (0.068)	0.652	-0.292** (0.118)	0.197
Government Effectiveness	-0.039 (0.117)	0.130 (0.133)	0.309	-0.386* (0.224)	-0.155
Voice and Accountability	-0.013 (0.074)	0.011 (0.092)	0.025	-0.414** (0.163)	-0.395
Political Stability & Absence of Violence	0.012 (0.045)	0.012 (0.054)	0.028	0.035 (0.086)	0.056
Rule of Law	-0.082 (0.089)	0.038 (0.113)	0.092	0.163 (0.192)	0.232

Table 5.9 Results of Governance Indicators for Triangular Transaction Food Aid

Variables	R-E.N.B.	Random-Effects Probit		Random-Effects GLS	
		Coefficient	Elasticity	Coefficient	Elasticity
Recipient respect of democratic norms	0.589*** (0.100)	0.449*** (0.092)	1.187	0.192 (0.167)	1.162
Recipient respect of civil liberties	0.751*** (0.122)	0.535*** (0.111)	1.431	0.239 (0.201)	1.411
Recipient respect of political rights	0.415*** (0.076)	0.326*** (0.068)	0.866	0.114 (0.126)	0.822
Recipient respect of empowerment	0.024 (0.073)	-0.017 (0.067)	-0.046	-0.352*** (0.114)	-0.390
Recipient respect of physical integrity	-0.109 (0.067)	-0.040 (0.058)	-0.103	-0.151 (0.100)	-0.237
Risk in recipient country	-0.016 (0.266)	-0.230 (0.255)	-0.589	-1.130*** (0.398)	-1.615
Control of Corruption	0.030 (0.109)	-0.011 (0.118)	-0.030	-0.113 (0.196)	-0.137
Regulatory Quality	0.111** (0.053)	0.020 (0.059)	0.053	-0.107 (0.102)	-0.063
Government Effectiveness	0.065 (0.127)	0.054 (0.132)	0.143	-0.039 (0.206)	0.077
Voice and Accountability	-0.227*** (0.085)	-0.265*** (0.090)	-0.699	-0.355** (0.142)	-0.925
Political Stability & Absence of Violence	-0.108** (0.046)	-0.110** (0.051)	-0.292	-0.105 (0.076)	-0.343
Rule of Law	-0.288*** (0.095)	-0.366*** (0.109)	-0.971	-0.110 (0.165)	-0.897

Table 5.10 Results of Governance Indicators for Local Purchase Food Aid

Variables	R-E.N.B.	Random-Effects Probit		Random-Effects GLS	
		Coefficient	Elasticity	Coefficient	Elasticity
Recipient respect of democratic norms	-0.291*** (0.108)	-0.151** (0.061)	-1.620	-0.046 (0.134)	-2.038
Recipient respect of civil liberties	-0.539*** (0.111)	-0.095 (0.122)	-0.282	-0.302 (0.231)	-0.531
Recipient respect of political rights	-0.231*** (0.080)	-0.092 (0.074)	-0.271	0.056 (0.137)	-0.164
Recipient respect of empowerment	0.673*** (0.075)	0.464*** (0.083)	1.424	0.175 (0.157)	1.352
Recipient respect of physical integrity	0.092 (0.074)	0.102 (0.063)	0.299	0.014 (0.111)	0.260
Risk in recipient country	0.621** (0.315)	0.768*** (0.295)	2.251	-0.405 (0.529)	1.433
Control of Corruption	0.505*** (0.146)	0.360** (0.141)	1.073	0.030 (0.252)	0.903
Regulatory Quality	0.703*** (0.107)	0.492*** (0.082)	1.459	-0.002 (0.128)	1.198
Government Effectiveness	1.624*** (0.143)	0.873*** (0.163)	2.597	0.170 (0.323)	2.299
Voice and Accountability	0.933*** (0.090)	0.499*** (0.107)	1.486	0.306* (0.184)	1.523
Political Stability & Absence of Violence	0.276*** (0.052)	0.138** (0.062)	0.415	0.085 (0.107)	0.423
Rule of Law	0.967*** (0.107)	0.487*** (0.131)	1.443	0.377 (0.242)	1.555

Table 5.10 confirms that countries with good governance face fewer situations where they need food aid. Indeed, all governance indicators, with the exception of physical integrity, have a positive impact on local purchase food aid. Thus donors are able to use local purchase food aid in countries with better governance, because there is food available in those countries. Furthermore, local purchase food aid distributional patterns are influenced largely by government effectiveness. An augmentation of one percent of the scale of government effectiveness is associated with an increase of 1.624324 percent of local purchase food aid. Thus, we could hypothesized it is not only the democracy that prevent from needing food aid, but many aspect of the governance of potential recipient countries.

Also, for direct transfer and triangular transaction food aid allocation decisions, all the good governance variables are non significant or negative with the exception of the regulatory quality indicators that measure « the ability of the government to provide sound policies and regulations that enable and promote private sector development». It is not surprising that this variable is that robust when we know that countries give more food aid to countries with whom they trade more and in some cases to more open ones. The regulatory quality of recipient government measures if recipient helps the private sector with good policy. Thus if donors give with respect to their economic interests it is more than predictable that they will give to countries with good sound policy.

In this section we found more empirical proof that allows us to strengthen previous findings. Mostly we retain that countries with good governance are less likely to need food aid and when in need, donors often chose to give local purchase food aid. Also, donors seem to give more food aid to countries that elaborate good economic development policy for the private sector.

Before studying the differences between donors' food aid allocation patterns, we will do a brief summary of the results of the section on good governance and food aid to underline some interesting findings. First we notice that the Physical Integrity Rights index (Recipient respect of physical integrity) is non significant and positive in all regressions besides of project food aid ones. This indicates that generally donors do not consider if there are torture, extrajudicial killing, political imprisonment and disappearance in recipient countries when elaborating their food aid distribution patterns. Project aid is an exception. Definitively, indicators from the *World Bank* best represent what donors consider before

giving food aid to potential recipients. All world governance indicators were significant in program, project and emergency food aid regressions. But in the case of emergencies all indicators were negative. Thus what we may conclude is that donors consider many aspects of governance when elaborating their food aid allocation patterns. But in the case of emergencies, they do not account of how governed is the recipient country because food aid is essential to the life of many persons. Furthermore they mainly consider governance in link to the category of food aid they are sending and not delivery mode. Indeed, it seems that the influence of the governance in the recipient countries do not vary much across food aid delivery modes. If we find that governance indicators are positive in the local purchase food aid regression it is because countries with better governance have more food available for these kinds of transaction. In the next section we will assess if different donors implies different food aid distribution patterns.

Food Aid by Donor

In this section we will do something completely different than in the previous two of this chapter. Indeed, we present a differentiation between the food aid donors. Each donor elaborates its own food aid patterns separately and thus, the reasons underlying the gift may differ between donors. Therefore, a quick individual evaluation of every states' program that contributed at least one year for one percent or more of the food aid's regime between 1988 and 2002 will be executed in this segment, that is: the United States, Canada, Australia, European Community, France, Italy, Netherland, The United Kingdom, Finland, Sweden, Norway, Denmark, China and Japan. We include this section because we find it is

important to underline the difference between donors practice. Furthermore, The majority of research on food aid has dealt with the biggest programs, such as the American Food for Peace program and the European community and Canadian programs. For many programs, this is the first research done precisely on them. There is an important lack of literature on the smaller programs and this impedes a better knowledge of the international food aid regime. Indeed, *World Food Programme* writes:

> It would be misleading, however, to ignore the significance of changes in the programme of the other (Other countries than USA, EEC, Australia, Canada and Japan) than donor countries. The relatively smaller donors have made, and continue to make, a disproportionate impact, for example, on internationally organized emergency assistance and multilaterally channeled aid generally. (Clay, 1985, p.2)

However the aim of this section is not to furnish a detailed analysis of every donor program but to assess if our model holds for all the donors or some distinctions are to be made between them.

We will first look at the fit of the model for the different regression. After, we will present the results for each variable among the different donor programs. Finally we will compare the results from some donor independently.

Tables 5.11, 5.12 and 5.13 present the results for each individual donor country food aid allocation patterns. We certainly loose some power of explanation by considering each donor separately, but our model still fits well in these regressions. There is one exception: China. Indeed, our model does not fit at all the Chinese food aid allocation patterns. The

Wald Chi2 test of this regression is not significant at 99 percent of confidence and the only variable that seems to matter is trade, and this with a very small elasticity; an augmentation of one percent of trade is between donor and recipient is associated with an increase of .0358303. This is quite interesting when we relate this with the fact that for some years China received and gave food aid. Further research will be needed to gain a better understanding of this program. For these reasons, for now on we will exclude the results of China from our discussion.

Let us begin our analysis of the differences between donors' food aid distribution patterns by considering the variables from the gravity model. The variable distance confirms that when the donor and recipient are geographically closer, food aid flows tend to be larger with the exception of the European Community, Japan and the Scandinavian countries. On the other side, population is mostly negative when significant. This supports our previous findings. However, this result does not apply to Canada, the Netherlands and The United Kingdom food aid programs that seem to priories larger countries. For The Netherlands and The United Kingdom we can simply explain this phenomenon by the fact that for our period of analysis, respectively 65 percent and 76 percent of their food aid flows were for emergencies. As we previously showed, larger population induces more emergency food aid, because there is more mouth to feed. Nevertheless we cannot explicate why Canada gives more to larger countries this way and for now we do not have any clue of why Canada differs. It would certainly take more research on the Canadian program to gain a better understanding of this practice.

Table 5.11 Results for Total Food Aid Distribution Patterns by Country(1)

	USA	EC	Australia	Canada	China
Recipient food supply	-1.081*** (0.395)	-2.352*** (0.361)	-0.370 (0.533)	-2.622*** (0.355)	0.795 (1.572)
Recipient GDP per capita	-1.276*** (0.089)	-0.322*** (0.083)	-0.687*** (0.104)	-0.565*** (0.075)	-1.025 (0.290)
Trade	0.249*** (0.034)	0.074 (0.057)	0.142*** (0.041)	0.145*** (0.037)	0.036*** (0.137)
Recipient economic openness	0.094 (0.080)	-0.584 (0.075) ***	-0.059 (0.127)	-0.024 (0.080)	0.411 (0.451)
Recipient respect of democratic norms	-0.249** (0.108)	0.303*** (0.100)	0.352** (0.154)	0.046 (0.106)	-0.084 (0.499)
UN voting similarity	-0.775*** (0.136)	-2.284*** (0.674)	1.836 (1.225)	-1.339* (0.765)	5.720 (8.507)
Distance	-0.619*** (0.092)	-0.078 (0.100)	-0.851*** (0.209)	-1.090*** (0.121)	-0.135 (0.399)
Recipient population	-0.215*** (0.047)	-0.112* (0.058)	0.054 (0.063)	0.168*** (0.052)	-0.181 (0.241)
Num. of obs.	1366	1910	1863	1893	1884
Num. of grps	100	136	136	136	136
WALD CHI2	502.31	491.16	215.86	518.66	19.71

Table 5.12 Results for Total Food Aid Distribution Patterns by Country(2)

	Japan	Germany	France	Italy	The Netherlands
Recipient food supply	-2.004*** (0.383)	-1.732*** (0.331)	-0.483 (0.532)	-2.198*** (0.396)	-2.425*** (0.366)
Recipient GDP per capita	-0.791*** (0.073)	-0.675*** (0.070)	-0.601*** (0.109)	-0.519*** (0.081)	-0.531*** (0.074)
Trade	0.056 (0.034)	-0.026 (0.044)	-0.062 (0.054)	0.021 (0.045)	-0.008 (0.041)
Recipient economic openness	0.265*** (0.083)	0.142** (0.072)	-0.079 (0.117)	0.024 (0.089)	0.071 (0.077)
Recipient respect of democratic norms	0.371*** (0.119)	0.075 (0.102)	0.392** (0.181)	0.017 (0.123)	0.264** (0.113)
UN voting similarity	-7.100*** (1.127)	-3.552*** (0.662)	-1.742** (0.739)	-3.884*** (0.872)	-3.038*** (0.726)
Distance	0.484 *** (0.121)	-0.194** (0.087)	-0.386*** (0.113)	-0.337*** (0.099)	-0.324*** (0.104)
Recipient population	0.001 (0.048)	0.205 (0.053)	0.035 (0.062)	0.062 (0.054)	0.131*** (0.048)
Num. of obs.	1874	1934	1861	1916	1927
Num. of grps	134	138	137	137	138
WALD CHI2	592.18	692.62	128.01	352.55	525.12

Table 5.13 Results for Total Food Aid Distribution Patterns by Country(3)

	The United Kingdom	Sweden	Norway	Denmark	Without USA and EC
Recipient food supply	29.226*** (0.265)	-1.159*** (0.378)	-1.191*** (0.419)	0.113 (0.455)	-1.054*** (0.130)
Recipient GDP per capita	-19.242*** (0.118)	-0.805*** (0.075)	-0.728*** (0.081)	-0.446*** (0.077)	-0.484*** (0.025)
Trade	9.270*** (0.050)	0.084** (0.035)	0.015 (0.029)	0.156*** (0.040)	0.048*** (0.009)
Recipient economic openness	-0.387*** (0.040)	-0.105 (0.081)	-0.186** (0.093)	-0.192** (0.098)	0.006 (0.029)
Recipient respect of democratic norms	-2.320*** (0.043)	0.451*** (0.119)	0.034 (0.134)	-0.129 (0.131)	0.166*** (0.041)
UN voting similarity	-13.004*** (0.082)	-2.566*** (0.890)	-4.578*** (0.935)	-1.902** (0.933)	0.164 (0.195)
Distance	-7.719*** (0.638)	-0.143 (0.100)	0.089 (0.142)	-0.133 (0.157)	-0.231*** (0.032)
Recipient population	2.584*** (0.151)	-0.0560 (0.050)	0.005 (0.047)	-0.177*** (0.054)	0.023 (0.014)
Number of obs	1929	1916	1865	1899	22761
Number of groups	138	138	138	135	1641
WALD CHI2	112646.04	493.21	408.47	60.48	1316.73

Furthermore, the variable trade is only found positive and significant for the United States, Australia, Denmark and Canada. Taken together these four countries account for 65% of all food aid flows. Thus, we may suspect that these countries are the only ones to consider trades in their food aid allocation patterns, but since they represent so much of the food aid regime we found trade to be significant in the main regressions of this research.

It is also worth noticing that the democratic commitment variable, LNDEMOC is found negative for the United States and the United Kingdom. This may indicates that these countries put more emphasize on governance in the recipient countries. There are two interesting facts about these results. First, as we just said, the United Kingdom gives mostly (76%) emergency food aid but they give it to countries with better governance. It may indicate that the United Kingdom is more sensible to the good governance in the recipient

countries event in emergencies situations. Also, in chapter three and four we presented the results of Fariss (2007) that indicated that the United States give more food aid to recipient countries with poor governance. The present results contradict the findings of Fariss and thus temper its theory about legal boundary and food aid allocation patterns[3]. Furthermore, breaking down data into each different national program allows us to confirm again the robustness of the needs variables. All donors considered the GDP per capita and most of them send food aid to countries with less food availability.

In this section we have been able to see differences between donors food aid program. Even if this section was too brief to assess all differences between all donors (It would have taken another fifty pages to do so), it helped us to confirm some previous finding and to attribute some practice to some donors precisely. However, it is important to take the results from the present section with great care for two reasons. First, when elaborating their food aid distributional patterns donors may consider gift from other donors. Thus taken separately some determinants could not seem to be significant, but it is because we need to have a large number of donor countries to have the right picture of food aid regime. Secondly, we did not break down the data into its different categories and delivery modes. We will now summarize all the findings of chapter five.

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[3] See chapter three for more details .

Summary of findings

By using the methodology elaborated in chapters three and four to different governance indicators, by differencing between two periods; 1988-1995 and 1996-2002, and donors, we confirmed many previous findings, but foremost we augmented the knowledge about food aid allocation patterns with original contributions. Here is a brief recapitulation of what we learned in chapter five. First, we found that most variables were qualitatively and quantitatively robust to both periods with the exception of population. It seems that inversely to the first portion of this study, the second period analysis predicts that countries with larger populations would receive more food aid. According to total food aid regressions, food aid would flow more to countries with good governance. But this section does not offer us any proof that donors give less food aid to corrupted potential recipient countries. But, we found when assessing the different categories of food aid, that donors were giving more food aid to countries with better control of governance with the exception of emergency food aid. We also found that for project food aid, donors consider all governance dimensions and we suspected that this might be linked to the previous findings of Burnside and Dollar (2000). Our results also indicate that emergency food aid flows more to countries with bad governance and this because bad governance enhances the need of emergency food aid. Furthermore, we find some dimension of governance to be very robust to the different categories and delivery modes. When business risk variable and government were found positive, they always were positive with the exception of emergency food aid for the previously given reasons. Also, as we explained in the section about the food aid delivery modes, regulatory quality and government effectiveness of

recipient countries were almost always significant and positive (not for emergency food aid) and often with a greater quantitative impact than other governance variables. Furthermore and more importantly, we proved that any studies on food aid distribution patterns should break down data as we have done. Chapters 4 and 5 both illustrate how by using this methodology we could avoid much misinterpretation of the data. However, we did decide it was important to do a quick differentiation between the different donor programs and found that some food aid practices were specific to some donors. To only note one, trade was only significant and positive for the United States, Australia, Denmark and Canada. Thus, chapter five did augment the knowledge about food aid allocation patterns in three ways; by differencing between two periods, by analyzing each donor programs separately and by assessing the relationship between good governance and food aid.

CHAPTER 6: CONCLUSION

International assistance is an important element of North-South relations. The current context of global food crisis enhances the importance of food aid in the international food security system and hence urges the international community to improve the knowledge about it. Many aspects of international assistance have been investigated, but we believe that our analysis fills a void in the food aid literature. We did not try to understand what motivates the absolute level of food aid, but the distribution of it between possible recipient countries. At the beginning of this thesis we identified three major points to be improved regarding food aid distribution patterns literature. First, we noticed that the majority of the previous researches on food aid were mainly on the three or four largest donors taken separately. Thus we applied a gravity framework to assess what really motivate all the major food aid donors. We also studied these fourteen programs separately to investigate the specificity of each donor. Secondly, we found it was important to better control for all potential food aid determinant. Therefore, in chapter two we developed a theoretical framework that account for determinants from all the categories previously identified in the literature on food aid (needs, political and economic interests of donors and recipient good governance). Thirdly and most importantly we advocated it is possible to gain a better understanding of food aid practice by breaking down the data into its different categories and delivery modes. Results are stunning. It is certainly the key contribution regarding the methodology of food aid studies that we do. In both chapter of results analysis we showed that we would have misinterpret many results. However our contributions to the food aid literature do not stop there, we also proposed a methodology

to better address the high proportion of zeros flows and possible heteroskedasticity, presented an original theoretical framework, and provided findings that have tremendous implications.

Before presenting the implications, let us remind the major findings of this research. First, in chapter four we found that two variables were robust to every food aid aggregation that we tested. Indeed, a higher gross domestic product per capita is always associated with less food aid. Even in chapter five when differencing between donors we always found recipient GDP per capita negative. Also, contrary to the findings of Neumayer (2005) we presented robust proofs that those economic interests of donors in form of trade matter. Although, breaking down the data into the different donors programs tempered those findings by indicating that only the United States, Australia, Denmark and Canada consider the level of trade they have with the potential recipient in the elaboration of their food aid allocation patterns. Surprisingly, the variable recipient food supply that represented the availability of food in the recipient countries has been found less robust. We explicate this paradox by the fact that programme and project food aid do not aim at food security precisely, but at poverty alleviation. Therefore, when programme and project food aid is given, donors consider less the food availability than the economic development of the potential recipients. Results also showed that as for trade flows, food aid flows are negatively impacted by distance without regard to the food aid delivery mode. Thus, as we explained, donors give more to nearby countries and this because of the transportation cost, the unfamiliarity effect of distance and because they want to have a regional influence. However, on the contrary to trade flows, food aid is generally negatively associated with the population of the recipient country. We understand those findings by hypothesizing

that in most situations needs are regionalize or affect only some part of the recipient population and that in larger countries other people of the same country may be able to help their own fellows, but in smaller countries it is not the case. Therefore when a country is larger in term of population, there are more possibilities to gain help within the country where food is needed and thus less needs of international food aid.

Furthermore, breaking down data into food aid delivery modes helped us understanding the relation of food aid and political and economic interests of donors in form of political affinities between donor and recipient and economic openness of the recipient countries. Indeed, we found that when donors give food from their own production they are less fussy about whether they are helping a friendly country or an economically closed country because in fact they are helping their own economy. But on the other hand, if they buy the aid on a foreign market, it is to help an open economically country and with which they have political affinity. Also we found in chapter four that the democratic commitment of the recipient countries may be related to its capacity to prevent famines. However, we decided that we did not understand enough the effect of the governance in the recipient countries on the food aid distribution patterns. Therefore in chapter five we tested the effect of many dimensions of good governance on the food aid allocation patterns. When doing so, we found that some dimensions of good governance were less considered than others. Indeed, donors do not seem sensible at if recipient respect the physical integrity rights of its population. However we found that the government effectiveness and the regulatory quality of recipient countries were almost always significant and positive when food aid is given in non-emergency situations. Results of the corruption indicator are stunning. It seems that donors will give more project and program

food aid to countries with more control of corruption, but will do the contrary for emergency food aid. We also found that all governance indicators are significant for project food aid. Thus when donors aim at development, they put more emphasis on how the recipient countries are governed. On the other side, emergency food aid flows more to countries with bad governance because governments from donor countries give less importance to the good governance in the case of an emergency, but those situations where emergencies happen are more common in countries with bad governance. This explanation was supported by the findings of locally purchased food aid that indicates it is easier to buy food aid in a recipient country with good governance.

Implications

At the inception of this research project we asked: *What are the factors conditioning the volume of food aid sent to potential recipient countries?* We found it was important to answer this question because food aid may really mitigate the harmful consequences of food shortage in some countries as long as the donor's own interests are aligned with the interests of the targeted countries. What we found in this research partially support that donors' actions are conditioned by the recipient needs. Indeed, results indicate that donors mostly consider needs indicators. However, some programme food aid regression and some individual donor regressions show that in some situation donors do not considered the needs in forms of food availability in the recipient countries. Knowing that programme food aid does not aim at food security but at the alleviation of poverty in recipient countries, we may argue that food aid is not the better way to do so. Indeed, as we said in

chapter two, food aid has huge consequences on the economy and the agricultural production of the recipient countries. Therefore if donors do not aim at diminishing hunger, we suggest that they use other ways to transfer money to the beneficiary. We may believe that this shift of paradigm may be already enhanced when we notice that the portion of program food aid diminished of 30% in the last two decades.

Furthermore, we found that political and economic interests of donors still matter in the elaboration of their food aid distribution patterns. Also, our results show that donors give tied food aid (food that come from donors own production) more easily than when they need to buy the food. Our research thus indicates that economic and political interests of donor countries are more important in the case of tied food aid. To be more efficient, donors need to stop considering their economic and political interest when elaborating their food aid allocation patterns. By sending food aid to recipients only for humanitarian motives, food aid would have a greater impact in alleviating hunger. In practice, it is sure hard to accomplish. However, donors need to diminish the importance of their own interests to give a better respond to the recipient needs.

Results of the regression of good governance indicators on food aid flow have also tremendous implications in practice. Regressions in both chapter four and five indicate that countries with better governance are less prone to need food aid. Therefore, recipients really need to improve their governance and by the same token they will ameliorate their food security. Results on the indicator of corruption are also really important. As we demonstrated, donors give more food aid to countries with better control of corruption, with the exception of emergency food aid. In emergency situations, corruption may be related to

needs. Thus it may be good that food aid flows more to those countries with less control of corruption. However, knowing that emergency food aid tends to flow more to countries with less control of corruption, donors need to monitor this kind of aid more closely than in other food aid. By doing so they would ensure that food aid go to the person really needing it.

Also, this research has important methodological implications for future researches on food aid flows. First, we clearly demonstrated that we understand a lot more food aid practices by breaking down food aid data into its different categories and delivery modes. We advocate, that when it is possible to do so, researchers should always do so. Also, we presented econometric estimators that better account for the presence of zeros and heteroskedasticity. Food aid studies need to be supported by estimators adapted to its reality. Therefore, future researches should always consider the presence of many zeros and the possible heteroskedasticity in their choice of estimators.

Naturally, our analysis could still be augmented. To begin with, even though we account for domestic interests in the donor countries, there could be other and perhaps better ways of accounting for domestic determinants. Also, our study did not account for Non-Governmental Organizations (NGOs) and for private donor food aid programs. Future research endeavors may take those ways to continue improving the general knowledge that we have of the international food aid regime. Furthermore, as for any other gravity analyses, our analysis is mainly a positive one and, thus, overlooks the normative aspect of food aid distribution patterns.

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APPENDIX 1

Previous Studies

Study and donor looked at	Period of Study	Estimation technique	Explained variable	Donor interests (DI) variables	Recipient needs (RN) variables	Good governance (GG) variables	Economic interest (EI) variables	Other variables	Main findings
Ball and Johnson (1996) US	1971-90	Pooled time-series and cross-section regression	Different combination of title of PL 480	1. Arms transfers 2. UN voting 3. Surplus grain stocks	1. GNP per capita 2.Per capita agricultural production 3.Infant mortality rates		1.Annual growth of per capita 2.GNP 3.Per capita holding of foreign exchange reserves	1.Population	Support for DI, RN and EI in 1980s humanitarian concern were more important than in the 1970s
Eggleston (1987) US	1955-79	Pooled sample, cross-sectional time-series: Tobit	Share of US food aid	1.Share US military and education grants of recipient. 2.US stocks of agricultural commodities	1.Per capita agricultural production (at t, t-1 and t-2) 2.non-agricultural production per capita		1.US commercial sales of agricultural commodities. 2.Foreign exchange reserves of recipient as proportion of total import 3.Net export of recipient as a proportion of GNP	1.Population 2.Population squared 3.Dummy: republican or democrat	Support for DI, RN and EI. Food aid influenced by political party elected in US
Barrett (2001) US	1961-95	Tobit	Food aid flows per capita	1.Non concessional food availability 2.Deviation from non concessional food availability				Region	There is no evidence that food aid responds to shortfall and goes to lower food availability country

APPENDIX 1 (Continued)

Study and donor looked at	Period of Study	Estimation technique	Explained variable	Donor interest (DI) variables	Recipient need (RN) variables	Good governance (GG) variables	Economic interest (EI) variables	Other variables	Main findings
Zahariadis et al (2000) US	1978-90	Two stage : Probit and OLS	Standerdize aid allocation as share of US food aid and by population of recipient	1.U.S. military assistance 2.British colony 3.French colony 4.Development assistance (non US)	1.Agricultural production 2.Refugees 3.Financial pressure				Support DI, RN, EI are more influential in stage 1 than 2. Under title 2 no influence of DI and EI.
Shapouri and Missiaen (1990) US, Can and EU	1975 and 1985	OLS	Level of food aid	1.Political ties	1.Growth in agricultural production 2.Food self sufficiency 3.Trade balance 4.Income per capita 5.Emergency dummy	1.Polyarchy	1.% trade with US 1.Donor export as a share of country total import and its growth		Support DI, EI and Rn for US, CAN and EC Support surplus disposal hypothesis No change between 1975-1985.
Barett and Heisey (2002) WFP	1975-98	Tobit	Food aid flows per capita		1.Non concessional food availability 2.Deviation from non concessional food advailability 3.Agricultural production			1.Lagged food aid 2.Region	Multilateral food aid distribution by the WFP flows counter cyclically

APPENDIX 1 (Continued)

Study and donor looked at	Period of Study	Estimation technique	Explained variable	Donor inerest (DI) variables	Recipient need (RN) variables	Good governance (GG) variables	Economic interest (EI) variables	Other variables	Main findings
Herrmann et al (1992) EU	1983-85	OLS			1.Per capita calory supply as a percentage of the daily calorie requirments. 2.GNP Current account 3.Food production per capita 4.Self sufficiency ratio		Cereal import per capita		Support RN and EI for EU
Neumayer (2005) US, EU, WFP and NGO	1990-1999	2 stages: probit and GEE	1.Food aid 2.Emergency food aid	1.Colony 2.Distance 3.US military grant 4.UN vote 5.Religion	1.GDP per capita 2.Per capita calory supply 3.Self sufficiency 4.Refugees		Donor export to recipient	Population	Dn bias in form of preferential treatment of geographically close countries,. Support for m
Young and Abbott (2008) US EU and WFP	1990-02	OLS and Tobit	1.Food aid Emergency, 2.projet and programme	1.Prod. shortfall 2.Average calories per capita 3.UN LCD 4.Violent conflict					Support m, and increasingly after 1995 Difference between type of food aid.

APPENDIX 2

VARIABLE	*HYPOTHESIS*	*INDICATOR*	*SOURCE*	*PREVIOUS STUDIES*
Recipient food supply	Recipient needs	Total amount of food available for human consumption expressed in Kcal/per capita/per day	FAO	Hermann et al, 1992; Young and Abbott, 2008; Neumayer, 2005; Eggleston, 1987
Recipient GDP per capita	Recipient needs	Gross domestic product per capita	United Nations Statistics Division	Ball and Johnson, 1996; Shapouri and Missiaen, 1990; Hermann et al, 1992; Neumayer, 2005
Trade	Donor economic interests	The sum of exports and imports of the donor country to and from the recipient country	Correlates of War Project	
Recipient economic openness	Donor economic interests	The sum of exports and imports divided by GDP	Penn World Tables	
Recipient respect of democratic norms	Good governance	Measure of civil liberty and political rights in recipient countries	Freedom House	
UN voting similarity	Donor political interests	The index of United Nations voting similarity	Erik Gartzke (2006)	Neumayer, 2005
Distance	Gravity equation	Harmonic distance	CEPII	
Recipient population	Gravity equation	Population	The World Bank, Penn World Tables	Ball and Johnson, 1996; Eggleston, 1987; Neumayer, 2005

APPENDIX 3

Variable Risk Composition

RISK (100%)	**Political Risk** (50%)	Government Stability (6%)
		Socioeconomic Conditions (6%)
		Investment Profile (6%)
		Internal Conflict (6%)
		External Conflict (6%)
		Corruption (3%)
		Military in Politics (3%)
		Religious Tensions (3%)
		Law and Order (3%)
		Ethnic Tensions (3%)
		Democratic Accountability (3%)
		Bureaucracy Quality (2%)
	Economic Risk (25%)	GDP Per Head (2,5%)
		Real GDP Growth (5%)
		Budget Balance (5%)
		Annual Inflation Rate (5%)
		Current Account % GDP (7,5%)
	Financial Risk (25%)	Foreign Debt % GDP (5%)
		Debt Service % XGS (5%)
		Current Account as % XGS (7,5%)
		Net Liquidity in Months (2,5%)
		Exchange Rate Stability (5%)

Source : http://www.prsgroup.com/ICRG_Methodology.aspx#PolRiskRating