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Abstract

This paper surveys the economic literature on the impacts of food aid on recipient countries. The paper reviews the conceptual and empirical challenges associated with evaluating the impacts of food aid and surveys the main analytical techniques that are used in such evaluations. It then summarizes the available economic evidence on the impacts of food aid on national economic development, domestic agricultural production and markets, commercial trade and the nutritional status of recipients.

Key Words: food aid, aid effectiveness, nutrition, trade, production, prices.

JEL: F35, O19, Q17, Q18.

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1. Introduction

Food aid has different meaning for various people. Many who are unfamiliar with the complexities of food aid programs view it as homogeneous in its form and purpose. The popular perception is that food aid primarily serves as temporary humanitarian assistance freely given to provide relief to victims of natural disasters (e.g., famines, tsunamis) and man-made conflicts (e.g., civil war). In reality food aid is more than just humanitarian assistance and the accompanying allocation and distribution issues are much more complex. Modern food aid, which began with the passage of United States Public Law 480 (PL 480) in 1954, is normally classified into three broad categories: program, project, and emergency (humanitarian) food aid.

Historically, the vast majority of global food aid transfers fit the category of program food aid which is foreign aid in the form of food that is usually given bilaterally as a government to government grant or concessional sale or loan (Barrett and Maxwell, 2005). Program food aid could be used to alleviate the recipient countries' macroeconomic problems due to balance of payment or budgetary constraints. Given that food aid donations tend to replace some commercial imports, it could serve as a form of balance of payments support when some of the foreign exchange that would have been spent on food imports is saved. This form of food aid is usually monetized (sold at market prices) and the counterpart funds generated could be used for supplementing government budget allocations for economic development. This implies that program food aid is usually not used as food assistance directly targeted towards the most impoverished and undernourished segment of the population. The size and scope of this form of aid has declined in recent years partially because it has been widely criticized as being ineffective in reducing food insecurity problems in recipient developing countries (Clay et al 1996).

In contrast, project food aid is primarily given on a grant basis as support for specific social and economic development projects (e.g., food-for-work programs (FFW), and food

for education programs). It could be given to a recipient government, a multilateral development agency or to domestic and international non-governmental organizations (NGOs). The World Food Program (WFP) is the primary agency responsible for administering multilateral food aid. The WFP and various NGOs administer project food aid to support a wide range of developmental projects targeting the poor in developing countries. Food aid resources are used to relieve unemployment, provide physical infrastructure, and in nutritional programs to alleviate food insecurity of the poor (Shaw and Clay, 1993). In recent history, parts of this form of food aid are also monetized and the proceeds from such market sales are used to fund project operational costs of the concerned NGOs. Barrett and Maxwell (2005, p. 13) noted that “it has become increasingly difficult to differentiate project and program food aid flows as the former has become increasingly monetized by NGO recipients much as the latter has been monetized by government recipients”.

The overall performance and effectiveness of several decades of food aid programs have been under scrutiny by policymakers and food aid analysts. Since the inception of food aid programs, there has been an ongoing debate among analysts on the motivations of donors and the impact of food aid allocations on recipients. Some observers still espouse the virtues of food aid programs and contend that it has been effective in achieving its objectives. They highlight the positive contributions of food aid in disaster relief and in assisting several European and East Asian countries improve their economies. In contrast, many other analysts have argued that food aid has been ineffective and has produced dismal results (Clay et al., 1996). They contend that food aid programs have not fulfilled its promise to alleviate hunger and stimulate economic development in many Asian and Sub-Saharan African recipient nations. In between these two extreme views are those who recognize the positive contributions of food aid in reducing poverty and food insecurity, but advocate new and improved strategies to making food aid programs more effective in achieving its objectives (Barrett and Maxwell, 2005).

Critics of food aid have contended that it has the potential to create disincentive effects in recipient countries (Schultz, 1960; Isenman and Singer, 1977; Maxwell and Singer, 1979; Cathie, 1981; Clay and Stokke, 1991). In addition, the role of food aid in combating global food insecurity has received more attention recently as food aid levels fluctuate with international cereal prices. Less food aid donations are available when they are needed most by recipient countries facing chronic food deficits and more expensive food imports. The data from recent decades of food aid allocation also shows that the top recipients are not necessarily the neediest and most food-deficit countries (see table 1). Also, the recipient country governments have been known to not distribute food aid to the most malnourished households, but have rather favored their political constituents by using food aid as “payment” for political support.

Table 1. Major Recipients of Global Food Aid and Undernutrition Rankings, 1998-2000.

Country	% of total population undernourished	Per capita food aid receipts (in kilograms)
Congo, Dem. Rep.	73	0.56
Somalia	71	3.72
Afghanistan	70	7.9
Burundi	69	2.22
Tajikistan	64	16.75
Eriteria	58	40.47
Mozambique	55	7.86
Angola	50	13.66
Haiti	50	16.82
Zambia	50	1.81

Source: FAO (2002) and Barrett and Maxwell (2005, p. 9).

This review paper revisits the food aid effectiveness debate by assessing the impact of food aid on recipient countries. Specifically, the second section of this paper discusses the various analytical challenges to evaluating the impact of food aid while section three reviews the methodological approaches applied in previous empirical analyses of food aid impacts. Section four provides a brief survey and a review of existing empirical evidence from previous studies on the effectiveness of food aid in alleviating hunger and stimulating

economic development. The paper concludes with a discussion of some practical policy recommendations for using food aid in tackling food insecurity problems. However, due to the relatively short term nature of emergency food aid and the scarcity of rigorous empirical data evaluation of its broad impacts, this study focuses primarily on the performance of program and project food aid allocations.

2. Challenges to evaluating food aid impacts

In recent years there has been numerous empirical studies examining the effectiveness of foreign aid in general. The impact of aid has been investigated both from both microeconomic and macroeconomic perspectives using various methodological frameworks and datasets. However, relative to general foreign (non-food) aid analyses, many fewer empirical studies have focused on the effectiveness of food as a form of aid and its effects on recipients' economies. Rather, the majority of the discussions of food aid effects have been descriptive in nature. The scarcity of such empirical analyses of food aid impacts can be, directly or indirectly, attributed to several limiting factors that pose major challenges to an accurate evaluation. These challenges includes: diversity of views on the proper definition of food aid and food security, lack of consensus on the measurement of undernourishment and food insecurity, lack of detailed data on important variables, and various methodological limitations.

Furthermore, the complexities of food aid in terms of its delivery, procurement, and distribution present a challenge for defining the role and impact of food aid. An accurate assessment of the impact of food aid on domestic agricultural producers in recipient countries would depend on whether food aid is given as grant (donation) or as concessional sale; whether it is procured via direct bilateral transfer, triangular or local cash purchase; whether it is distributed freely (e.g., school feeding program) or as payment in-kind (e.g., food-for-work (FFW) program) or sold on the open market.

2.1 Defining and measuring food aid and food security

There is a lack of consensus on the definition of both food aid and food security (Barrett and Maxwell, 2005). Thus, the evaluation of the nature of the relationship between the two variables poses both a conceptual and empirical challenge. There are various, and sometime conflicting, definitions of food aid in the literature. A constant point of contention has been focused on the how various donors define and distinguish between the two forms of global food transactions: “sales on concessional terms” versus “commercial sale” (Shaw and Singer, 1996). Also, there is a gap between the conceptual definitions adopted by food aid practitioners and that favored by academic analysts. The former group’s view of food aid is broader and includes all forms of food supported interventions to abate food insecurity in all countries (including rich donor nations). The latter group which represents much of the empirical literature on food aid tends to use a more limited definition of food aid.

Food aid defined too broadly could be misleading as it may incorrectly include all forms of food assistance programs (e.g., food stamps, school lunch programs) in developed countries (Barrett, 2002a). In contrast, food aid defined too narrowly may implicitly exclude important aspects of various food aid programs and thus underestimate their impact on recipients in developing countries. Barrett and Maxwell (2005) argue that an accurate definition of food aid must include three attributes that distinguishes the international food aid programs from all other forms of food assistance programs: international transfer; payment has concessional component; and focus on providing food. At the very least, the definition of food aid must reflect the international nature of the transactions.

The lack of consensus on the appropriate definition and measurement of food security limits the general inferential scope of the existing empirical evaluations of the effectiveness of food aid programs as a tool for fighting food insecurity. For example, the controversy about the proper definition of undernourishment and hunger poses a practical challenge for analysts interested in an empirical evaluation of the relationships between

food aid and food security. There is a significant gap between the two most commonly cited estimates of the number of undernourished people in the world: the Food and Agricultural Organization (FAO) and World Health Organization (WHO) estimates. The FAO model, based on national per capita calorie availability, finds that undernourishment is most severe in sub-Saharan Africa. In contrast, the WHO model, based on anthropometric surveys and heavily weighted toward children, suggests that undernourishment is most pronounced in South Asia. According to Svedberg (1998), the margin of error of the FAO model results ranges from 21-61 percent. This large discrepancy between these two estimates is significant to food aid and food security policy because these numbers are widely used by food aid researchers, professionals, and policymakers in discussions and decisions related to global food security issues. Although there is room for future improvements, these two key estimates play a significant role in how we currently measure the level of global hunger and food insecurity.

Since food security is unobservable and analysts have to use a variety of proxy indicators, empirical analysis of food aid effects are only as accurate as the measures of food security employed. Earlier indicators of food security were predominantly based on measures of food supply and availability. Thus, the focus was on developing accurate estimates of expected levels of food production volumes in comparison to minimum caloric requirements. The demand side and other related factors were essentially ignored. More recently, the indicators of food security have been broadened to account for the role of market prices, income, and nutritional risk factors (Barrett, 2002a, p. 2126; Sen, 1981, 1990). The indicators of food security employed by recent empirical studies include measures of food availability (stock), food deprivation and malnutrition risk (Babu and Pinstrup-Andersen, 1994; Strauss and Thomas, 1998).

2.2 Data limitations

Empirical studies of food aid are also constrained by the lack of accurate data on food aid distribution and the extent of food insecurity. The assessment and measurement of food insecurity can be very problematic as the reliability of the data from various survey and

statistical sampling processes may be very questionable. This is true primarily because of the lack of socioeconomic institutions and physical infrastructures necessary for accurate data collection in many of the recipient developing economies. For example, accurate data on food security may not be available for inaccessible rural communities and unsafe regions of the countries experiencing major political and social conflicts (e.g., war and guerrilla activities). Also, when data is actually collected, the variables for which data is available are limited in scope and excludes information on some rather important variables. These problems are due to the high costs of data collection and the need for speedy response to food scarcity during emergencies.

Furthermore, it is challenging to reconcile data on similar variables collected by different agencies. In several cases, many researchers have discovered that apparently similar variables in both FAOSTAT and INTERFAIS (WFP) databases could not be easily merged or reconciled (Osakwe, 1998; Lowder, 2004). The INTERFAIS database classifies food aid into three categories: program, project, and emergency (relief) food aid. Since these three categories are broadly defined, they have overlaps and fail to capture some important information about the food aid transfers. For example, there is a difference in how a year worth of data for variables are aggregated in both databases. While the INTERFAIS annual data are measured over July – June, the annual data for FAOSTAT defines a year as January-December. In addition, neither the FAOSTAT nor the INTERFAIS databases contain important information on donors term of delivery (grant or concessional) or how food aid was distributed in the recipient countries (free or monetised). Although program food aid is usually monetized, the same is not true for project food aid where just a portion of the total is sold on the local market. Obviously, there are opportunities for future improvements in the process of food aid data collection and documentation. Also, more project and program specific food data are needed for more accurate empirical analysis of the impact of various food aid programs.

2.3 Methodological constraints

Both qualitative and quantitative methods are necessary in the evaluation of the impact of food aid programs. While there are several qualitative evaluations of food aid program effectiveness, studies based on rigorous empirical analyses are scarce. As previously noted, data availability is a significant constraint to comprehensive quantitative analyses of the impact of food aid programs on recipient economies. Barrett (2002a; p. 2152) discussed several methodological shortcomings inherent to the analysis of food aid effects. First, the omitted variable problem is common to empirical model specifications of food aid impact on various measures of food security. This is a potential problem because some of the relevant variables in the models may not be quantifiable or observable. There may also be significant measurement errors inherent to several of the available variables on various aspects of food aid program activities.

Second, empirical estimates of food aid effects are subject to simultaneity bias and inefficiency of the estimates as several of the control variables included in the model are endogenously determined and they do not have reliable proxies that could be used as instruments. These methodological shortcomings points to a more fundamental problem of data collection inadequacies and other measurement error issues prevalent in empirical studies of food aid impacts. These methodological and data limitations explains why many of the existing studies on food aid are predominantly qualitative and comparative in nature. There is a need for more rigorous empirical evaluations of food aid impacts and an even more pressing need for improved data collection on food aid activities that better lends itself to empirical testing and analysis.

3. Review of analytical and empirical methods

The choice of empirical methods adopted in previous analyses of the impact of food aid depended on the focus and scope of the studies. Several earlier studies were interested in assessing the impact of food aid on the overall economy. Thus, case studies focusing on individual countries were particularly common. In general, the methods used in evaluating the impact of food aid programs can be classified into two broad categories: qualitative

(descriptive) and quantitative (statistical) approaches. Furthermore, past studies could also be classified as either household and/or country level analyses. These classifications are not overly rigid as some previous studies have applied a combination of various analytical methods in their analyses. Maxwell and Singer (1979) and Shaw and Clay (1993) provide a comprehensive review of the early literature on the performance and effectiveness of food aid programs. Barrett (2002b) contains a good synopsis of the statistical methods used in more recent empirical studies.

3.1 Qualitative (Descriptive) methods

Many of the earlier evaluations of food aid effectiveness consisted of individual country evaluations of a particular food aid program or project. In general qualitative studies describe the changes in various policy alternatives and provide an assessment of the impact by comparing the pre- and post-intervention circumstance of the beneficiaries of the policy intervention. Qualitative assessment approaches apply a range of descriptive summary and analysis. They also attempt to generalize their findings for particular countries to other recipient nations. The emphasis was usually placed on *ex post* assessment of the overall economic development impact of food aid donations. Cassen and Associates (1986, p. 105) note that this type of food aid impact assessment is usually done "... jointly by the donor and recipient, or by the donor alone, at the time donor involvement ends, or at the end of each phase of a longer term programme". These types of food aid program evaluations usually provide voluminous reports which focus on issues related to program implementation and performance over the course of several years.

For example, McClelland (1998) documents the methods and results of USAID's comprehensive evaluation of the impact of American PL 480 food aid programs in various recipient countries. McClelland (1998, p. 15) notes that this study was primarily qualitative in nature as "no attempt was made to gather data amenable to statistical analysis". Also, the USAID program evaluation did not involve the use of questionnaires or formal surveys. According to McClelland (1998), the USAID reviewers based their analysis of food aid impacts on brief site visits and oral interviews of government officials, NGOs,

and other donors. This type of descriptive evaluation approach is typical of most food aid donors and agencies.

Comprehensive evaluations of the performance and effectiveness of food aid donations pose several challenges. Unlike the private investors who could evaluate success by comparing pre- and post-project financial returns, the success of public projects could not be so easily determined. Food aid project evaluations must also consider other factors which may not be easy to measure or evaluate. These factors include the economic rate of return on construction-type development projects and the impact of food aid resources on the overall welfare (nutrition, income, and employment) of particular groups and households in the recipient economy.

Furthermore, the determination of the impact of non-emergency food aid on the economic development recipients is problematic due to the complex and non-homogeneous nature of food aid. In order to accurately assess the development impact of food aid on a recipient nation, a thorough knowledge of various facets of the domestic economy is required. In addition, it is important to properly control for the effect of other variables (unrelated to food aid) that may account for changes in a nation's economic welfare. By definition and implementation, program food aid is not targeted. Thus, the lack of proper targeting of program food aid also makes it difficult to adequately evaluate its impact on the poorest and most food-deficit households in the country. Furthermore, the data on the necessary project performance variables are usually difficult to obtain as they could not be easily measured. The proxy variables, when available, tend to do a poor job of capturing the real impact of food aid resources.

In general, descriptive impact assessments are limited in scope and application as they are often project-specific. The findings could not be not easily generalized across projects or sectors within a particular country. Neither are such results comparable across countries. Furthermore, these studies often lack specific information on how food aid affects particular economic variables of interest. They are primarily technical reports on the

implementation of various food aid programs funded by the donors. For instance, important questions about the nature of the additionality of food aid and its potential disincentive effects on local food production and employment are often ignored.

3.2 Quantitative (Statistical) Methods

In more recent times, the application of quantitative modeling methods to the analysis of food aid effects has become increasingly popular. This trend has been fueled by the increasing sophistication of statistical modeling techniques and the availability of faster and more powerful computing technology. In general, the quantitative modeling approaches involve the development of a theoretical economic framework that captures interactions between food aid and other economic variables (agricultural production, trade, etc). The specific methods used in empirical analyses are diverse and are applicable to both household and national level data.

The quantitative modeling framework could be either partial or general equilibrium analysis and the time dimension could be static or dynamic. The estimation technique could be non-parametric or parametric. By definition, partial equilibrium models ignore inter-sectoral linkages within an economy but focuses on a specific economic sector. In contrast, general equilibrium models are more comprehensive in coverage as they explicitly account for inter-sectoral relationships within the economy.

Although some statistical analyses employ non-parametric testing methods (e.g., Levinsohn and McMillan, 2005), they are the exception. Thus, this review focuses on parametric modeling approaches which account for the majority of empirical studies of food aid effects. Parametric quantitative testing methods can be classified into two categories: Computable general equilibrium (CGE) and regression-based models. The regression models can be further sub-divided into the following sub-groups: static cross-sectional and dynamic time series data modeling techniques. The remainder of this section briefly summarizes the empirical estimation and testing techniques employed by previous studies and provide some examples in the literature that used each approach. However, the

discussion of the empirical results from previous analyses is not included yet as it will be presented later in section 4.

3.2.1 Computable general equilibrium models

Although most of the literature on food aid impacts adopted the partial equilibrium modeling framework, the general equilibrium modeling approach is particularly relevant to the quantitative analysis of the impact of food aid on the overall economy as this usually involves multi-sector and multi-market impact analysis. CGE models are primarily based on linear and non-linear programming methods and their analytical scope could entail just a single region or it could multi-region. However, the large data requirements needed for most CGE models have precluded a wider application of this approach to the analysis of food aid effects. The few exceptions include studies by Bezuneh et al (1988) and Arndt and Tarp (2001) for Kenya and Mozambique, respectively. There are some other studies which emphasized the importance of CGE models in the context of the interactions between international trade, food aid allocations and food security needs (see Tyers and Anderson, 1992; Hertel, 1997; Pinstrip-Andersen et al., 1997).

3.2.2 Static cross-sectional regression methods

Regression analyses are popularly used to estimate the “influence” that exogenous variable(s) have on endogenous variable(s). Regression-based empirical models of food aid effects could be either static or dynamic. The majority of the previous regression-based studies of food aid emphasized static econometric analysis of cross sectional data. Many previous studies applied the ordinary least squares (OLS) estimator and its variants such as probit, tobit, and fixed effects models. Since these classical econometric techniques are well-known, this section will only provide references to specific food aid studies that applied these methods. Several studies employed OLS models (Hoffman et al, 1994; Diven, 2001) while some others used the probit and tobit modeling methods (Barrett, 2001; Jayne et al, 2002; Gupta et al, 2004; Abdulai et al, 2004; Yamano et al, 2005). Also, some researchers used the fixed effect model specification to analyze food aid data over a cross-

section of countries (Dercon and Krishnan, 2001; Barrett and Clay, 2003) and a few studies employed a demand systems specifications, such as the AIDS model (Bezuneh et al, 1988).

3.2.3 Dynamic times series methods

Several studies used time series modeling methods to investigate the dynamic relationships between food aid allocations and various economic variables. Time series model specifications are particularly relevant to food aid data analysis as they allow for modeling the dynamic relationships inherent to food aid data available through the FAO and WFP databases. Time series data uses modeling techniques such as vector autoregressions (VAR), developed by Sims (1980), and cointegration and error correction models, proposed by Engle and Granger (1987). In these types of analyses, the emphasis is on testing for Granger non-causality and the tracing of the impact of market and/or policy shocks on other economic variables.

In contrast to more traditional over-identified and less dynamic econometric models, VAR-type time series models are widely used in empirical research because they require the use of minimal zero restrictions. The dynamic adjustment path of policy interventions can be traced over time through the analysis of forecast error variance decompositions (FEVD) and impulse response functions (IRF) computed from VAR models. Relative to standard static regression coefficients analyses, IRFs and FEVDs could provide more accurate and informative inferences about the effect of food aid interventions. For additional readings on time series modelling techniques, see the following sources: Sims (1980), Engle and Granger (1987), Johansen (1988), Hamilton (1994), and Enders (2003).

Despite the potential benefits from the application of time series modelling methods, very few empirical studies on food aid effects have explicitly accounted for the time series properties of the data used. Probably the first empirical food aid impact study that explored dynamic issues was Lavy (1990) which examined the validity of the claims that food aid allocations create production disincentive effects. Subsequent studies that considered VAR

modelling techniques includes: Barrett (1998), Barrett et al (1999), and Donovan et al (1999). More recent studies extended dynamic time series models to panel data and also applied generalized methods of moments (GMM) modeling techniques (Lowder, 2004; Quisumbing, 2003).

Overall, the choice of modeling methods in the analyses of food aid effects should be informed by the nature of the research question and the tested hypotheses. In many cases, the options and alternatives available to the analysts are usually constrained by data quality and availability. Since the majority of available macroeconomic data on food aid are time series, it is important that future research on food aid effects take advantage of recent developments in time series econometric modeling methods.

4. Empirical evidence on food aid effects

Different types of food aid may have different socio-economic impacts. Thus, it is reasonable to analyze the impact of food aid by examining each of the three major categories: program, project, and emergency. Program food aid could be evaluated in terms of its impact on national economic development and poverty reduction. Thus, much emphasis is placed on how recipient governments use counterpart funds from monetized food aid as additional budgetary support for various economic developments projects. In contrast, project food aid is assumed to be more targeted as a means for funding specific developmental projects that enriches the lives of the poorest and most food-deficit households and communities. So, it is reasonable to evaluate the effectiveness of the various forms of developmental projects (e.g., FFW; health and nutritional enrichment programs) supported by this form of food aid. Lastly, emergency food aid which is often a multilateral effort could be evaluated, relative to bilateral food aid allocations, in terms of its effectiveness in meeting food security needs. As earlier stated this paper focuses primarily on the impact of program and project food aid and leaves the analysis of emergency food aid effects to future studies.

4.1 Food aid effect on national economic development (poverty reduction)

One of the earliest justifications of program food aid is its potential for serving as a source of balance of payments and foreign exchange support for recipient countries. Thus food aid could be a tool of economic development and poverty reduction in food-deficit and foreign exchange-constrained developing nations (Shaw and Clay, 1993). Monetized food aid could potentially serve as a key source of income for the recipient government and help relax budgetary and balance of payments constraints. The additional resources from domestic food aid sales could be used by the recipient government to reduce the taxation of its agricultural sector and rather increase investment in agriculture (Colding and Pinstrup-Andersen, 2000, p. 202).

In spite of this argument for food aid, it is still debatable whether program food aid has effectively reduced food insecurity in food-deficit low income countries. The degree and extent of the macroeconomic impact of food aid in helping the poor has been a point of controversy among analysts. Some argue that program food aid (monetized food aid in general) has not been very effective in achieving sustainable economic development and poverty alleviation goals. For example, Clay et al (1996) assessed the contributions of EU's program food aid and concluded that EU food aid donations have been ineffective in alleviating food security concerns in recipient countries. They found that the recipient's domestic food assistance and subsidy programs funded through counterpart funds from program food aid tend to be anti-poor. Such programs often target the urban "middle class" population in these countries and they are relatively inaccessible to the poorer households who mostly live in rural communities.

Furthermore, in their comprehensive evaluation of the impact of US PL 480 food aid allocations to various developing countries, McClelland (1998) also found that program food aid has not been very effective in fighting poverty in recipient nations. This conclusion about the relative ineffectiveness of program food aid is one of the reasons for the recent decline in the volume of this form of food aid donations (Clay et al., 1998). As evidence mounts on the ineffectiveness of program food aid and as donors' agricultural

surpluses decline, the landscape of food aid donations has gradually been shifting from development to emergency relief (Clay, 2003).

4.2 Food aid effects on recipient's food markets (production and prices)

Much has been written on the disincentive effects of food aid since Schultz's (1960) widely influential analysis of the potential for a negative impact of food aid on recipient countries' agricultural production. There are several ways that food aid can create disincentives to recipient's agricultural economies (Maxwell and Singer, 1979; Maxwell, 1991). The supply of inexpensive food aid may have a negative *policy effect* as the recipient governments may ignore needed policy reforms and shift developmental resources away from the agricultural sector (Wallerstein, 1980). For example, a developing nation's government may delay or ignore politically sensitive structural economic reforms needed to alleviate persistent food shortages and inaccessibility to food by low-income households. Food aid then serves as a stop-gap measure which would not result in sustainable economic development.

Furthermore, a negative *price effect* for domestic food producers is possible as large volumes of food aid imports may cause an outward shift in the domestic supply curve and depress local producer prices. Thus, the lower producer price is a disincentive to local production. For example, EU food aid in the form of milk powder had a negative effect on the local dairy industries in several recipient countries (Singer, et al, 1987, p. 189). Although there have been several empirical investigations of the validity of the price and production disincentive effects, the results have been mixed. While earlier studies found some evidence in support of the disincentive effects of food aid, several more recent empirical analyses found little or no evidence in its support.

For example, Mann (1967) evaluated the impact of food aid in India and found support for the notion of disincentive effects. He showed that food aid imports resulted in a significant decline in Indian agricultural output. In a subsequent study on India, Isenman and Singer (1977) found that the disincentive effect has weakened considerably in the presence of

improved government food distribution policy. In a comparative study of three food aid recipients in Sub-Saharan Africa, Maxwell (1991) found weak support for the disincentive effects of food aid and suggested that the effect of food aid on local prices and production depends on the prevailing institutions and policies. Fitzpatrick and Storey (1989) also found some evidence in support of the disincentive effect of food aid.

In contrast, several empirical studies found that the case for food aid disincentive effect is generally not supported by the data. For example, Lavy (1990) found no support for disincentive effects using data for Sub-Saharan African countries. Rather, he found that food aid imports encourage additional local food production in cases where food aid complements domestically produced cereals. More recent studies by Barrett et al (1999) and Abdulai et al (2004) provide further evidence indicating the absence of significant disincentive production effect in recipients' economies. Lowder (2004) also shows from a cross-country panel data analysis that there is no significant disincentive effect on domestic agricultural production in recipient economies, irrespective of whether program or targeted food aid was analyzed. Lowder's (2004) finding of lack of support for disincentive effects hypothesis for targeted food aid is consistent with results from earlier analyses (Maxwell, 1991; Arndt and Tarp, 2001). Other studies that investigated the impact of food aid on recipients markets include Hoffman et al (1994) and Tschirley, et al (1996).

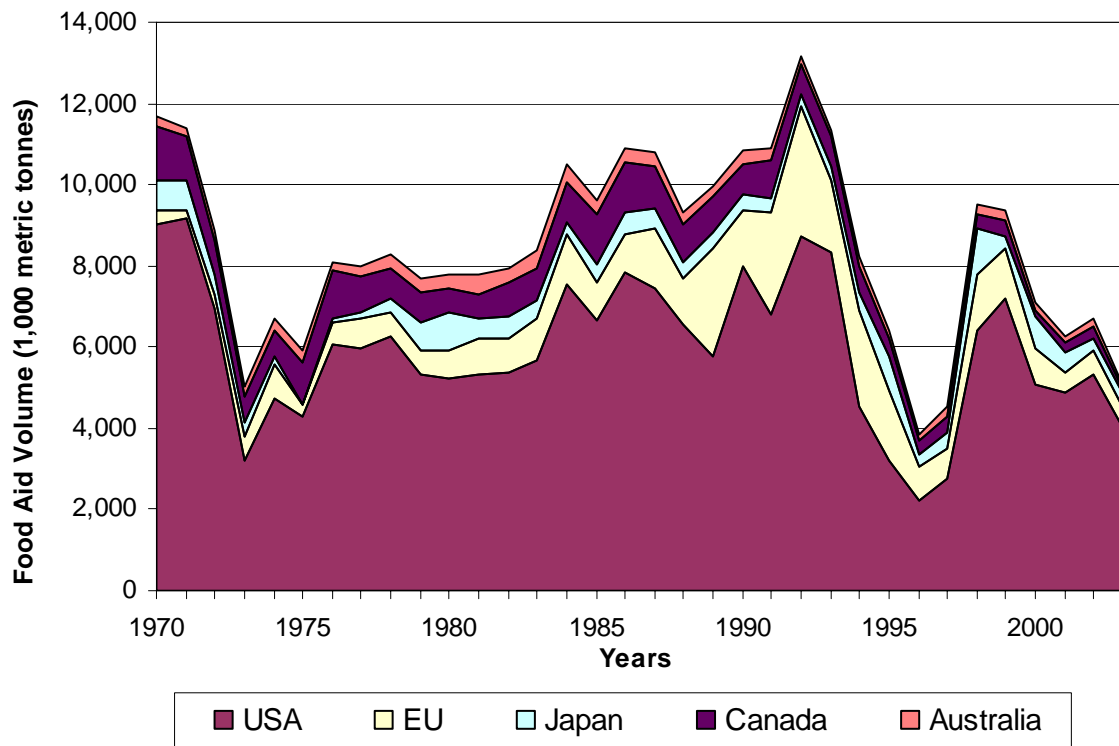
The mixed empirical evidence from the assessments of the food aid disincentive effects could be partially attributed to some implicit assumptions in Schultz (1960) original propositions. First, it is assumed that the recipient country is a closed market economy where prices are determined domestically without outside influences from domestic government or international trade. Second, it is also assumed that the food aid basket is identical to the domestically produced food basket. Third, food aid is assumed to be non-targeted to the most food insecure and poor segment of the population. Food aid is also assumed to be additional to regular food imports (i.e., no commercial food import displacement). If all these assumptions hold, then food aid can be expected to depress domestic food prices and production. Only then would there be disincentive effects.

However, the sum of these assumptions is unrealistic and thus the validity of the disincentive effect argument may be weak. For instance, it is unrealistic to assume a closed economy for recipient countries because most food aid recipients participate in international trade and experience significant government interventions in the food market. Furthermore, Mohapatra et al (1999) attribute the ambiguity of the existing evidence to the cancelling out of both the positive input and negative output market effects of food aid on the domestic agricultural economy. They argue that the net effect of food aid on the recipient's economy is analytically ambiguous because the outcome depends upon diversity in the recipient countries investigated and specific food aid program characteristics.

4.3 Food aid effects on commercial food trade

The potential impact of food aid on commercial international food trade has been a recent source of debate and controversy at the Doha Round of the World Trade Organization (WTO) negotiations (Hoddinott, et al 2003; Clapp, 2004). The current debate focuses on the potential for the use of food aid as a means by donors to circumvent the WTO disciplines on export subsidies reductions. Given the complexities of concessional food aid allocations, which are usually sold at prices lower than prevailing world market prices, it could be used by donors to achieve the same objectives as export subsidies and credits. For example, Title I of US PL 480 food aid program, administered by the US Department of Agriculture (USDA), explicitly used concessional sales of food aid to promote the development and expansion of foreign export markets for US agricultural commodities (Diven, 2001; Clapp 2004; Barrett and Maxwell, 2005).

Figure 1. Global Food Aid Shipments by Major Donors, 1970-2003.



In spite of the commercial motives of major donors, current food aid shipments have significantly declined from its historical level (see figure 1). This trend is driven by recent decline in agricultural production surpluses of major food aid donors. This decrease in food aid supply is closely associated with the agricultural policy reforms and liberalization in both the US and EU in the 1980s and 1990s which resulted in a fall in donors' commodity stocks and higher world food prices (Saran and Konandreas, 1991; Taylor and Byerlee, 1991; Ruttan, 1993). Thus, as world food prices increase and donor cereal stocks fall, less food aid is allocated.

Relative to the empirical literature on food aid disincentive effect on local production, the issue of food aid's potential to displace commercial food imports remains an empirical question that requires more attention. Little empirical evidence exists on the relationship between food aid and commercial food trade (Cathie, 1981; Barrett, 1998; 2002b). The

existing empirical literature on the relationship between food aid and commercial food trade has focused primarily on the issue of whether food aid displaces commercial food sales. Although FAO's (1980) "Principles of Surplus Disposal and Consultative Obligations" require that food aid should not displace commercial food imports, but should be additional to the Usual Marketing Requirements (UMRs), this has not always been the case. Several recent studies have shown that food aid is only partially additional (approximately 30-60 percent) as it displaces a significant amount of commercial food imports by recipients (Clay et al., 1998; Barrett, 2002b).

In contrast to popular views, Barrett and Maxwell (2005, p. 81) argue that the claim that food aid works as a market development tool for donors is a myth and that it is not supported by empirical evidence which indicates that food aid actually displaces donors' commercial food exports in the short run. The available empirical evidence on food aid effects on trade suggests that it partially displaces commercial food imports (Abbot and McCarthy, 1982; Fitzpatrick and Storey, 1989; Clay et al., 1996; Barrett et al., 1999). In a seminal empirical study, using data for 18 recipient countries, Barrett et al (1999) tested the hypothesis that a J-curve effect exists between US PL 480 food aid shipments and commercial food trade volumes. They found that support for the J-curve effect as commercial imports falls in the short run since it is initially displaced by food aid; but commercial food imports by recipients increase in the long run due to the dynamic income multiplier effect.

Furthermore, Barrett (2002b) notes that "food aid receipts consistently replace 60-80 percent of the commercial food imports recipient economies would have made." Several other studies came to similar conclusions that non-emergency food aid has the potential to displace commercial imports of food in the short run (von Braun and Huddleston, 1988; Saran and Konandreas, 1991; Clay et al., 1998). Barrett (2002b) argues that the proper targeting of food aid distribution plays a key role in determining if food aid displaces commercial food sales to recipient countries. He found that in the absence of effective targeting, empirical studies indicate that food aid displaces recipient countries' commercial

food imports. This implies that when food aid is well targeted, it would be additional and would be less likely to displace commercial food imports.

4.4 Food aid effects on nutritional status of recipients

There is an established link between poor human nutrition and poverty. The extent of poverty is particularly severe for vulnerable groups such as women and children in low income households. Despite the claims that food aid may displace recipients' local food production, it can play an important role in fighting malnutrition and poverty via its consumption effect on low income consumers. Food aid increases the total domestic supply of food and thus leads to reduced food prices which could then have a positive impact by reducing poverty and malnutrition in low income households. In principle, food aid could be used to build human capital when it is used to as a tool to improve the nutritional status of children and pregnant and lactating women.

The performance of food-for-work (FFW) and supplementary feeding programs could be a good indicator of the effectiveness of food aid in combating malnutrition. A significant proportion of food aid (63 percent) is distributed through FFW programs and the remainder is distributed as free direct transfers, such as in school feeding programs (Dercon and Krishnan, 2001). Usually, free distribution programs are targeted toward those who cannot work while FFW programs target those who could physically participate in some form of community development programs and receive food aid as a form of payment.

Few empirical studies exist on the nutritional impact of food aid on recipients. The findings from previous analyses on the effect of various direct distribution and supplementary feeding programs on nutritional status have been mixed (Clay, et al, 1998). While some studies found that FFW and supplementary feeding programs have positive short term effects, others found weak and inconclusive evidence to support a positive impact of these programs in the long run. In a survey of supplementary feeding programs, Beaton and Ghassemi (1982) concluded that, relative to the programs' cost, their long term nutritional impact on participants is rather limited.

FFW programs in Bangladesh and India are two examples of food aid programs that were relatively successful in reducing food insecurity. The projects facilitated guaranteed employment for low skilled workers in rural areas who participated in various labor-intensive rural infrastructure development projects (Dev, 1995; Ahmed, et al, 1995; Clay, et al, 1998). Also, Bezuneh and Deaton (1997) reported significant nutritional gains for participants in Kenya's FFW programs. This could be attributed to direct increase in food consumption and/or indirectly through increased household income associated with the FFW program.

Nevertheless, while FFW programs have been relatively successful in meeting the nutritional needs of food-deficit households in the short-term, they have not been as effective in providing long-term food security. Rural infrastructure projects supported by FFW programs are not equipped to adequately address both short and long range food security goals (Clay, et al, 1998). In another study for rural Ethiopia, Yamano et al (2005) found that relative to households who do not receive food aid, recipients of food aid experienced less child malnutrition and stunting. They conclude that "food aid has indeed been effective in protecting early child growth from droughts and other income shocks in food aid receiving communities."

In contrast, other studies were unable to find conclusive evidence in support of significantly positive nutritional effect of various food aid programs. Two separate studies by Brown et al (1994) and Webb and Kumar (1995) examined nutritional impact of FFW in Niger and found inconclusive evidence. Although they found a positive relationship between nutritional status and participation in the FFW program, they were unable to establish causality due to limitations from using a single cross-sectional data. More recently, Quisumbing (2003) investigated the "effects of food aid on individual nutritional status, as measured by indicators of child nutrition" in rural Ethiopia and found that although food aid has a positive effect on nutrition, the impact differs by gender of the child and the form of food aid distribution. Participating households tend to devote income

from free distribution to girls nutrition while FFW income relatively make a more significant contribution to nutrition improvements in boys.

Although the various supplementary feeding programs are effective tools in increasing the caloric intake of the recipients, it is not enough to eliminate malnutrition. Beyond the increase in the quantity of caloric intake, the quality of the nutrient content of food aid is also important. In addition, other factors may contribute to sub-optimal caloric intake and increased prevalence of malnutrition. These factors includes, poor treatments for infectious diseases, nutritional imbalances in local diets, and various social and cultural conditions that give priority to adult males rather than mothers and children. More research is needed on the nature of the interaction between food-based interventions with other health-related factors and how they collectively impact the nutritional status of the poor in developing countries.

5. Concluding remarks

Since the inception of the US PL 480 food aid program in 1954, food aid has been an important tool in the global fight against poverty and hunger. The potential macroeconomic benefits of food aid for low income recipients have been widely discussed. It is reasonable to assume that food aid provides extra foreign exchange as it could substitute for normal spending on food imports. The saved foreign exchange could then be used for other pressing economic development needs such as funding for non-food imports, addressing balance of payment deficits, and the repayment of foreign debt. Food aid also has the potential of serving as a tool in addressing food security challenges in many developing nations. However, many analysts question the extent of the contribution of food aid allocations in facilitating economic development and reducing malnutrition in food-deficit low income countries.

In recent years, the political and economic landscape of food aid allocation has changed significantly. There has been an increasing shift in the emphasis of food aid allocation from development to relief (Clay, 2003). As the demand for humanitarian food aid

allocation has increased the level of food aid for development purposes have declined. While humanitarian concerns are central to food aid donations for disaster relief, a significant portion of bilateral program and project food aid were motivated by both political and economic interests of the donors (Eggleston, 1987; Shapouri and Missiaen, 1990; Ball and Johnson, 1996; Clay, et al 1998; Neumayer, 2005). In the context of current debates on the effectiveness of food aid programs, a review of existing empirical studies of food aid effects is needed.

The existing empirical studies on this issue fail to provide conclusive evidence on the relative performance and effectiveness of food aid allocations. The scope and applicability of many of the past empirical studies have been hampered by food aid data limitations and various methodological constraints. While many studies have focused on the microeconomic impacts of food aid, the limited studies on the macroeconomic effects of food aid have predominantly examined the disincentive effects of food aid on recipients' agricultural production. Not much empirical analyses have emphasized the relationship between food aid and commercial food trade. Given the current discussions on the role of food aid at the Doha Round of the WTO negotiations, this is an issue with significant agricultural policy implications for both developed and developing nations.

Overall, the evaluation of the effectiveness of program food aid as an instrument in fighting poverty and food insecurity is problematic because its effects cannot be measured directly. There is no one-to-one correspondence between the funds generated from monetized program food aid and government-sponsored food expenditures on the poorest households. Since the budgetary allocations of funds from monetized food aid are usually spent at the discretion of the domestic governments, potentials for mismanagement exist. In many cases, counterpart funds from food aid seldom trickle down to the poorest and most food insecure households. Furthermore, the success of food aid in alleviating poverty and reducing malnutrition in low income countries depend on the effectiveness of targeting (Barrett, 2002b; Barrett and Maxwell, 2005; Jayne et al, 2002). If food aid is not well targeted to the most undernourished people, then food aid cannot be effective in helping to

improve the nutritional status of the poor in recipient nations. Food aid distribution policies of donors and recipient governments and NGO's play a pivotal role in determining whether the right groups receive food aid and whether aid arrives at the right time. Unfortunately, bilateral food aid donor allocations are not always motivated by altruism and concern for alleviating malnutrition and poverty in recipient countries.

The absence of effective targeting of program food aid to the poor and food-insecure makes it a weak tool for alleviating poverty and promoting food security. Although food aid may provide additional resources to recipient countries, its overall impact on recipients' economic and social development are limited and are constrained by various political and economic institutional factors (Isenman and Singer, 1997; Burnside and Dollar, 2000). In order to ensure improvements in the effectiveness of food aid allocations, there is a great need for better food aid targeting at all levels. In addition to improved food aid targeting, donor agencies, recipient governments, and NGOs need to allocate more resources to the collection of food aid data on various variables necessary for rigorous empirical evaluation of the impact of food aid on recipient economies. It is feasible that improvements in food aid data collection and availability could serve as a catalyst for more empirical research in this area.

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