Responsiveness of Food Aid in Cereals to Fluctuations in Supply in Donor and Recipient Countries

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Abstract: This paper attempts to analyze quantitatively the link between food aid and surplus production in the major food aid donor countries. Simple regression models were estimated for wheat, coarse grains, and rice using data for 1962-82, depending on the commodity and donor. Carryover stocks and world prices proved to be significant variables in explaining the variability of food aid flows for all three commodities. Relative to the volume of food aid in each commodity, the effects of carryover stocks were substantial for rice, moderate for wheat, and relatively small for coarse grains. The price effects were considerable for wheat, moderate for coarse grains, and relatively small for rice. In terms of individual food aid donors, the two variables proved to be significant in explaining food aid shipments in the case of Canada, Japan, and the USA, which have generally provided food aid much in excess of their minimum commitment under the Food Aid Convention (FAC). For the other two major donors (Australia and the European Community), food aid shipments were closely related to minimum commitments under the FAC. This paper further analyzes the response of food aid to production fluctuations in low income, food deficit countries. The response has been partial, estimated to cover only about 13 percent of cereal production shortfalls.

Introduction

Since the beginning of food aid operations in 1954, the total volume of food aid in cereals has substantially changed. The 1954/55-1965/66 period was characterized almost entirely by food aid shipments from the USA under its "Food for Peace" programme and to a small extent by shipments from Canada. Food aid increased rapidly, reaching a record of nearly 17 t of cereals in 1965/66. The bulk of food aid during that period was given as balance of payments support, channelled bilaterally, directed mainly to Asia, and consisted primarily of cereals, particularly wheat.

The 1966/67-1976/77 period saw a sharp decline in the overall volume of food aid in cereals, coupled with increased year-to-year variability. The pattern of food aid transfers underwent a considerable transformation. By the late 1960s, donors other than the USA and Canada began to provide food aid, and, in 1967, the first Food Aid Convention (FAC) was signed, with 17 donors undertaking to provide a minimum of 4.2 t of food aid in cereals per year. However, by the late 1960s, the substantial surplus stocks held by the USA had been depleted, and, despite the emergence of other donors, total shipments decreased to less than 6 t in the food crisis of 1973/74. The volume of food aid remained highly variable in the following 3 years, recovering to 9 t by 1976/77.

Since 1976/77, the total volume of food aid in cereals has hovered around 9 t a year. While the number of donors increased to over 25, USA, Canada, EC, Japan, and Australia accounted for most shipments in cereals—their combined share in recent years amounting to over 94 percent. A large part of food aid shipments in cereals since 1976/77 represented minimum commitments under the FAC, which were increased in 1980 to 7.6 t a year.

Most food aid used to be provided in bulk for sale, but the share of food aid used as a wage good or input into specific projects has increased. Project food aid now constitutes about 30 percent of the total. That changing pattern in the use of food aid can be attributed partly to an increase in the proportion of food aid that is multilateral (which is mostly project and emergency aid) and partly to an increased desire to avoid possible disincentive effects by targeting food aid more directly to vulnerable groups and priority purposes. Over one quarter of food aid is now provided multilaterally compared to less than 5 percent in the late 1960s.

The geographical distribution of food aid has also undergone large changes. The significant and sustained growth in domestic food production in several major countries in Asia has made that region less dependent on food aid. Thus, compared with the early 1970s when Asia received over 70 percent of total food aid, its share fell to only half of that by the early 1980s. On the other hand, food aid to sub-Saharan Africa increased sixfold during the period. Aside from meeting part of the growing chronic food deficits in sub-Saharan Africa, the shift is also the result of donors' responses to emergencies that have stricken sub-Saharan Africa during the past decade. During the crisis in 1984/85, food aid shipments to sub-Saharan Africa reached about 5.6 t or about 47 percent of global shipments during that year.

Factors Influencing Food Aid Shipments

The developments briefly outlined above indicate that an increasingly complex international food aid system has evolved over the past 3 decades, in terms of both logistics and institutions involved (see Wallerstein, 1980; Cathie, 1982; Hopkins, 1983; and Singer, 1983). The purpose of providing food aid undoubtedly now includes development objectives and the specific needs of recipient countries. The potential of food aid in support of development objectives was recognized early in the food aid literature (Blau, 1954; and FAO, 1955), and principles for safeguarding an orderly disposition of surplus commodities were subsequently devised.

To the extent that food aid could be viewed as a transfer of economic resources from rich countries to poor countries, the amount provided might be expected to depend on general economic and political factors determining the overall level of development assistance. However, in general, such a link between food aid and overall development assistance has been rather weak. In fact, food aid disbursements as a percent of total development assistance have declined and have been much more volatile than other forms of development assistance, indicating that, by and large, food aid programmes of major donor countries have been influenced first and foremost by conditions in their own agricultural sectors and only secondarily by development objectives.

The agricultural sectors of many developed countries over the past 30 years have been characterized by increases in agricultural productivity and policies aimed at improving farm incomes. Those factors, in combination, often resulted in the accumulation of excessive food surpluses. Donor governments found it desirable to dispose of surplus commodities as food aid. Surplus disposal is often a consideration within the food policy environment of the donor countries, and, thus, the amount of food aid provided each year may be as much or more a function of supply availability in donor countries as of the needs of recipient countries.

The expenditure on food aid by a donor is determined by budgetary allocations for such aid, which are made in monetary terms well ahead of shipments. For some donors, the setting of budgetary allocations for food aid may be independent of developments in the food sector. Prospects in the cereals market are, however, more likely to have some influence on the setting of budgetary allocations for food aid. For those donors whose food aid shipments have been directly related to their minimum obligations under the FAC, budgetary allocations would need to change in the same direction as prices to ensure that their minimum commitment were achieved. For those donors who ship in excess of their FAC obligations and whose food aid baskets cover a wide mix of commodities, possibilities exist for substitution among the commodities provided. Substitution may be motivated in part by the need to maintain a certain volume of food aid (even when prices are high) by decreasing the share of relatively expensive commodities. The motivation for substitution between commodities may also arise from donors' needs to meet their commercial obligations in certain commodities.

To the extent that prevailing prices at the time when allocations are made have an effect on setting budgetary allocations, that effect should be captured by lagged prices. Once budgets for a given year are set, the quantity to be provided would largely depend on commodity prices at the time of shipment. Thus, both current and lagged prices could have determining effects on the volume of food aid shipments.

Current production in the rest of the world may also have an effect on food aid shipments. In particular, that would be the case if donors' food aid shipments are responsive to the variability in cereal production in recipient countries.

The general model that incorporates all the above factors and that is considered in the estimation of the level of food aid of a given commodity provided by a given donor has the form:

$$F_{ijt} = f(Q_{ijt}, S_{ijt}, P_{it}, P_{i,t-1}, Q'_{it}, C_{jt}, t),$$

where:

F_{ijt} = quantity of food aid in commodity i provided by donor j in year t;

Q_{ijt} = level of domestic production of commodity i in donor country j in year t;

S_{ijt} = beginning level of stocks of commodity i in donor country j in year t;

P_{it}, $P_{i,\,t-1}$ = world export price of commodity i in year t and $t-1$, respectively;

Q'_{it} = level of production in commodity i in the rest of the world, other than the major exporters of commodity i, in year t; and

C_{jt} = commitment of food aid in cereals under the FAC by donor j in year t.

The above model does not take into account other factors that may have influenced the level of food aid, such as commercial market development objectives or foreign policy considerations. Nor does the above model attempt to incorporate the underlying factors that may have been responsible for observed long-term trends in food aid in cereals. To the extent that such trends were important, they should be captured by the time trend variable, although without explaining any underlying causality. Finally, not all the explanatory variables included in the model specification are independent from each other. However, to exclude one altogether from the estimation, *a priori*, is not appropriate. To isolate the most significant factors, several subsets were considered in the estimation.

The explanatory power of the model varies considerably between the different commodities and donors; however, a certain pattern emerges with respect to the degree of importance of the various variables considered. The level of carryover stocks and export prices explain a considerable part of the year-to-year variability of food aid provided by the USA, Canada, and Japan, which have generally shipped much in excess of their minimum FAC commitments. With respect to the price effect on food aid shipments, a noticeable difference exists between wheat and other grains. For wheat, the current year world price is the significant factor, but for coarse grains (and to some extent rice), world prices of the previous year are more significant. Overall, carryover stocks and prices explain between 68 to 90 percent of the observed variability in food aid shipments by the three donors. On the other hand, for the other two major donors (Australia and the EC), the level of food aid shipments is very closely linked to their minimum commitments under the FAC.

The extent to which carryover stocks have influenced food aid shipments differs for the three cereal commodities. The effect of carryover stocks is substantial on food aid in rice, moderate for wheat, and relatively small for coarse grains. A change of 100 t in the volume of rice stocks resulted in a change in the same direction in rice food aid shipments of about 10 t. The corresponding change in food aid shipments in wheat is estimated to be 5.3 t and that for coarse grains only 1.1 t. The lower response of food aid to carryover stocks for coarse grains than for wheat and rice is partly attributable to the fact that not all coarse grains are readily acceptable for human consumption, for a variety of reasons.

The effect of world market prices on the level of food aid also varies for the three cereal commodities. The price effect is considerable for wheat, moderate for coarse grains, and relatively small for rice. An increase of one dollar in the per ton price of wheat resulted in a reduction in wheat food aid by nearly 13,000 t. The corresponding effects are about 7,000 t for coarse grains and 600 t for rice.

Very high prices resulted in sharp reductions of wheat food aid shipments by up to 1.4 t, but the maximum increase in food aid during periods of relatively low prices, such as those experienced in recent years, was less than 600,000 t. Similar impacts of about the same relative magnitudes were observed for coarse grains and rice. Various factors may be responsible for the observed relationship between food aid and price changes. Whereas prices are not constrained on the upper side, prices are usually supported by government intervention on the lower side. Also, an asymmetry exists in the options available to balance supply and demand between low and high price years. Fixed budgetary allocations limit the volume of food aid in years of high prices; but low prices do not necessarily lead to higher food aid shipments as surpluses could be placed in stock. Finally, the absorptive capacity of recipients for food aid is limited, precluding major expansions of food aid shipments in the short term.

Donors' Response to Recipient Countries' Needs

The level of production in the rest of the world has been, in general, negatively correlated with food aid shipments. To analyze the extent to which that negative correlation implies a responsiveness on the part of the donors to production fluctuations in the food aid recipient countries, relationships between food aid flows to selected recipient country groups and the deviation of their cereal production from trend have been estimated.

The results show a statistically significant relationship between food aid flows and deviations of cereal production from trends, indicating that donors have, in general, responded to the increased needs of the recipient countries arising from short-term production shortfalls. However, that response has been partial, estimated to have covered only about 13 percent of cereal production shortfalls for low income, food deficit countries as a whole (excluding China and India). For the most seriously affected countries within this category (i.e., the least developed countries), the response is estimated to have been somewhat better, covering about 20 percent of production shortfalls. Because of aggregation, however, donors' response to cereal production shortfalls of individual countries is not revealed by the results, although other evidence suggests that donors' response has been roughly of the same magnitude. For example, in the case of India for the 1957-71 period, about 20 percent of cereal production shortfalls were covered by food aid.

Overall, within their availabilities of food aid, donors have given higher priority in the implementation of their food aid programmes to low income, food deficit countries. However, in relation to the food aid needs of those countries, the volume of food aid provided has been inadequate. Although donors substantially increased the share of food aid shipments to those countries between the early 1970s and the early 1980s, total food aid provided accounted for only 18 percent of food imports of the low income, food deficit countries in the latter period compared to 30 percent in the former.

The partial response of food aid flows to meet the rising requirements of low income, food deficit countries is mainly due to the stagnation of the overall level of food aid availabilities at around 9 t for the past several years. At the same time, current food aid requirements have been estimated at over 20 t of cereals a year (FAO, 1983). Other recent assessments made by Huddleston (1984) and USDA (1984) also point to levels of food aid needs that are much higher than current availabilities.

Conclusions

In the 30 years since the beginning of the food aid system as a permanent mechanism of transferring resources from rich to poor countries, the motives of providing food aid have shifted considerably from a surplus disposal régime towards development objectives and consideration of the specific short-term needs of the recipient countries. The availability of a large part of food aid has now been institutionalized through successive Food Aid Conventions. However, the extent to which food aid varies from year to year above that level still depends to a considerable degree on the availability of surpluses in the donor countries.

The observed link between cereal aid shipments and carryover stocks in the major donor countries implies that short-term prospects for increasing the volume of food aid would depend to a considerable extent on the size of cereal surpluses in those countries. However, in view of domestic considerations in donor countries, their farm policies aim increasingly at controlling the level of cereal production. The volume of food aid in the coming years could thus be significantly influenced by the degree of success of those policies to bring about a balance between production and demand.

Other factors have an increasing influence on donors' decisions concerning the level of food aid provided, particularly relating to the role of food aid as an effective development resource and its more specific role as one component in the complex process of strengthening food security in developing countries.

Food aid has an undeniably vital and irreplaceable role in increasing access to food by the poor, improving the diet of vulnerable groups, and relieving famine. Food aid's more important contribution, however, is as a development resource to promote long-lasting rural development in low income, food deficit countries (FAO, 1985). Thus, the extent to which development assistance resources will be increasingly in the form of food aid also depends on the success of devising innovative approaches to the use of food aid to maximize the benefits realized by the recipient countries.

Note

[1]Commodities and Trade Division, FAO.

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