

PN-AAS-320 . 39159

MICROECONOMIC IMPACTS OF PL-480 FOOD AID

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Paper to be presented at PL-480 Conference April 5-7, 1983.

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Washington, D. C. 20036**

March 1983

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There is a growing catalogue of case studies investigating the impacts of food aid. When attempting to draw conclusions from that body of examples and counter examples one is well advised to keep in mind the observation of Drs. Clay and Singer that the developmental value of food aid depends crucially on the policies of the recipient government. Food aid reinforces existing patterns as much as it creates new ones. To a degree, there is a parallel to the impact of new agricultural technology which, even if neutral in its potential, has been seen to have different impacts depending on the institutions in the region where it is introduced.

Yet a discussion is not very instructive if we are unable to go beyond the comment "which country? When?" Even after discarding the studies with flawed methodologies, the studies which infer a causal relationship from temporal concurrence and the studies which rest on counterfactual historical scenarios, can we draw any general conclusions about the microlevel impact of food aid? We must caution against an overall judgement as to whether it is beneficial or detrimental for the simple reason that we have not agreed upon a criterion for evaluating its impacts. Food aid is called upon to serve multiple goals. It is not surprising, then, that proponents and opponents can find praise or fault at the same time. One philosophical school which strove for "the greatest good for the greatest number" was criticized

for desiring one "greatest" too many. In a similar vein, policy makers are admonished by economists that for every independent target there should be a corresponding independent instrument. Clearly, the topic for discussion at the workshop is whether food aid must be designed somewhat as a blunt instrument - merely as an exogenous shift of supplies - or whether it can be included in a package designed for the economic conditions of the recipient country.

There are a number of issues of household decision making which will condition the response to the policies adopted. Some of these involve areas in which consensus is still far from achieved, for example, the role of intrafamily distribution of income and food, the role of time in household decision making and the causes of divergent preferences for increased food consumption in households which appear to be at risk of malnutrition. Nevertheless, these issues of how households react to their economic environment are less likely to engender impassioned debates than determining how that environment is formed. We are somewhat at a disadvantage in discussing this interface of macro and microeconomics for although it is obvious that governments are crucial actors in the arena, we lack an understanding of how governments determine policy.

In a typical country the majority of grain imports and exports are handled by a governmental monopoly. Similarly much of domestic trade in agricultural commodities is handled by parastatal corporations. It is not novel to point out that our microeconomic theory of the firm is only a partial guideline to understanding the decisions of the managers of such agencies, or that consumer utility maximization must be

tempered with political science when explaining a government choice of policy. Yet commonly it is a failure to agree on what decision rules influence actions within this governmental black box that determine differing views on the impact of food aid. For illustration, let us consider a few examples of decision rules and likely impacts of food aid that follow. The rules are simple ones. Indeed it is hoped that frustration with the simple forms, will stimulate discussion of more realistic typologies of government behavior which by their very complexity offer more degrees of freedom for designing appropriate food policies.

Presume initially an economy where the bureaucrats are instructed to manage as little of the economy as possible; specifically they do not interfere with free trade of goods and avoid setting prices. In this textbook case of an open market the food will be supplied perfectly elastically at the world market price plus transport. A change in domestic demand or production will not effect prices. Nor will food aid. In the absence of restrictions each additional unit of aid will substitute one for one with initial imports. To the degree that aid is concessional, rent accrues to the government. This represents the difference between the market value of the food aid and the cost to the government. This will be a savings in foreign exchange which in a truly open economy will have a impact on the exchange rate which in turn will make imports somewhat cheaper. The price effect, likely small, will increase demand and reduce production as a new equilibrium is established.

As a laissez-faire attitude to force imports and prices in such an economy is fairly rare, let us take up an example of an economy in which the government retains a complete monopoly on prices. Suppose, further, that the logistics agency is given instructions to provide a regular flow of grain so as to maintain that price level. Despite the difference from the first case, this agency's decision rule, in effect, ensures an elastic supply, hence the impact of food aid would be the same as the previous case. Without usual marketing requirements (UMR) the food aid would affect the consumer or producer only indirectly through the revenue and foreign exchange enhancement of the concessional terms.

Indeed, it is possible to assume a variety of plausible import decision rules that when taken by themselves promote one for one substitution between food aid and commercial imports. For example, food security rules which maintain stocks at predetermined levels, or rules which fix quantities imported based on calculation of target levels of average caloric consumption might have this effect. Suppose, however, that food aid has been available in the past. Will a government adapt its expectations and, hence, reissue guidelines to the import agency? That is, does it instruct the appropriate agency to defend a lower price ceiling, or increase the total import quota? Clearly, this is an empirical question. In some circumstances a government may use the availability of food aid to relax the procurement quotas assigned to rural offices. In others, the government may moderate inflation by allowing falling relative food prices. Because it is difficult to assign causality in these forms of adaption, partly because they are

beyond economic theory, they are one major area of debate in the discussion of food policy.

But seldom does food aid include all the options mentioned already. Specifically, aid programs are designed to ensure that commercial imports remain at historical, or trend, levels. Before discussing the impact on the trading economics in our illustrations let us consider an economy in which food aid would not compete with imports. An obvious polar case of such a typology is the closed economy, perhaps, for our illustration, one which is self sufficient in grain, but at a low level of average consumption. As commercial imports are zero at the outset, there can be no substitution. Food aid would shift the domestic supply curve outward. In the expected equilibrium markets would clear with prices lower than originally. The increase of total consumption, however, would be less than the amount of aid, as farmers would reduce production and marketing in response to the new price environment.

It should be apparent that when we include the UMR in our trading economics the impact on domestic supply resembles that of the closed economy. Indeed, the laissez-faire economy, admittedly a polar case, would have to create new institutions in order to meet this restriction. Similarly, other economies in which the government does take an interventionist role in food policy would need to modify their guidelines. Most simply, in order to increase domestic consumption to accomodate the increment in food imports through aid, the country can lower the ceiling price it chooses to defend. As in the closed economy, this price would signal agriculture to reduce production. If

the government intervenes directly in agriculture through procurement and/or acreage planning it could influence a reduction of domestic production of crops now imported in increased quantities. We should note, however, that in an interventionist economy in which prices do not reflect scarcity costs, the shifting of cropping patterns that result may not represent an economic loss to the society even if they result in commercial losses to a portion of farmers. Indeed a common faulty methodology employed in evaluating the impact of food aid on an economy is to look at production of individual crops without full consideration of comparative advantages and the economic costs not fully indicated by a distorted price environment.

Since most governments are becoming increasingly aware of the importance of agriculture in economic growth and of the importance of price incentives in agricultural production, it is worthwhile asking whether it is possible to avoid shifting domestic production in response to increasing total food imports. Most commonly, it is pointed out that an outward shift of the demand curve can maintain domestic prices following an increase in total supply. An additional appeal of such an approach is that the increase of demand may be targeted to a segment of the population particularly at risk of poor nutrition, thereby achieving one of the stated goals of food aid. One approach is through employment generation, typically food for work. Another is to recognize that food aid represents revenues to the government embodied in the concessional forms. If domestic prices exceed the concessional price, then food aid may be used to raise revenues with which to fund either income transfer (including food

stamps) or price support schemes which seek to increase food consumption of targeted groups.

Both Lane and Mellor have argued that this is an important role of food aid. With an understanding of the nutritional status of the population and their response to income and price changes one can evaluate the effectiveness of various schemes in meeting such goals. The benefits, however, can not be fully quantified in economic terms and, therefore, a full cost-benefit appraisal is not attainable. Assuming that nutritional targets are agreed upon goals can they be simultaneously used to shift demand sufficiently to avoid a decline in the price of agricultural production? Not from the revenue generated from food aid alone. Specifically, one can show that unless the marginal propensity to consume food (MPC) out of additional income is 1 - that is, that the target group spends all additional income on food - and that, also, food aid is totally concessional, the increased demand will not offset the increased imports in the short run.

Formally we can equate the change of commercial imports as a function of the degree of concessionality and the MPC.

$$1) \quad \Delta CI * P_d = MPC * (P_d - P_c) * A - A * (P_d)$$

where CI are commercial imports, P_d and P_c are domestic and concessional prices respectively and A is the volume of food aid. The smaller the degree of concessionality the larger the reduction in commercial imports necessary to prevent downward pressure on prices.

(see appendix) if increasing consumption, then, is a goal of a food aid package that includes commercial import restrictions and a goal of maintaining agricultural prices, additional revenues or a grant would

be needed. The same would be true, of course, in a country which has no commercial imports. This grant would need to be equal to one minus the MPC times the value of food aid at domestic prices. A portion of this grant can be embodied in the concessional terms of the food itself, but as indicated earlier, except under unrealistic assumptions, additional revenue will be required.

Given the likely downward pressure on prices subsequent to food aid to food aid and commercial import restrictions what other mechanisms to support producer incomes exist? In many countries forced procurement at below market prices, and/or export levies serve as taxation of agriculture. In principle, a country could substitute revenues raised from sales of concessional food aid to either reduce such taxation or, equivalently, to subsidize farm incomes. Since, however, the value of sales lost by the agricultural sector equals the value of aid at domestic prices plus the domestic price decline times the post aid share of domestic trade, revenues generated from sales of concessional imports can not, by themselves, offset the loss of farm revenues. A subsidy scheme, then, needs additional funding to maintain farm revenues in a manner analogous to the consumption subsidy proposal. A few caveats apply. Firstly, loss of farm revenues are not equivalent to loss of farm earnings; the latter are typically smaller. Secondly, as mentioned, where prices are imperfect indicators of scarcity costs, loss of earnings do not necessarily indicate economic losses to the nation. Furthermore, although both consumption

and agricultural subsidy schemes can, in principle, be designed as income transfers, the latter are more prone to introduce allocative distortions. Both however, are prone to the political fates that lurk in transfer programs. Finally, although it should be obvious, revenues generated from food sales and used for targeted consumption generation can not be used for a direct agricultural subsidy and vice versa.

Recognizing that most food aid and commercial import packages are likely to reduce demand for domestic production does not, however, necessarily imply agricultural stagnation or reduced farm earnings. Counter-examples of impressive net growth or even growth in production of a commodity received as aid are possible. (Sri Lanka and Bangladesh are both examples, though causality can not be indicated.) At this point we should remove our focus on the market clearing price and consider the costs of production. If the revenues generated by the concessionality, or included in an overall aid package, are used to lower the costs of production then net farm earnings may increase even with declining market prices. This could be in the form of infrastructure generation including transport and irrigation, or in the form of agricultural research. Frequently, returns to the latter are appreciable and, also commonly, governments tend to underinvest in such research. The advantages and pitfalls of new agricultural technology are well known. The question that directly affects the design of a food aid package is whether the availability of aid discourages a government from investing in research. It is not

necessarily the case that investment in a public good will follow the same price signals as a commercial enterprise. Were the real world a textbook case, research would follow shadow prices. Of course, the world is not such a textbook case yet recent research at IFPRI does indicate that government investment in agricultural research is more strongly correlated with total import volume than with domestic prices.

Suppose, then, that a food aid program included a provision for market sales to raise revenues for agricultural research. Or alternatively suppose that food aid is used as a lever to change development strategies to raise the incomes of the poor. The problem here, as with other self-help measures is that of fungibility of revenues. The extra revenues are likely to be divided up amongst competing claimants much in the manner of any other revenue enhancement. Only in a case in which revenues generated from food aid exceed previous allocations for research and are separately accounted are increased levels of funding assured.

In summary, we see that the multiple development and commercial objectives of food aid along with logical behavior of recipient governments pose inherent obstacles to simultaneous fulfillment of stated objectives. The challenge is both to explicitly acknowledge trade offs between objectives and to devise flexible programs to maximize benefits in those areas deemed of highest priority.

APPENDIX

Equation 1 addresses the possibility of using income transfers to increase food consumption. One can derive a similar formula for price subsidization that indicates the % of grain that can be subsidized from food aid receipts, for any predetermined level of import reduction.

- 2) change of supply = $\Delta S = A - C$ where $C = \Delta CI$
 where λ is total grain consumed by the target group and ϵ is their price elasticity. Total initial consumption is $(1-\lambda)+\lambda$.
- 3) change of demand = $\Delta D = \lambda \epsilon \frac{\Delta Pd}{Pd}$

- 4) The revenues raised by sales of food aid are

$$(Pd - Pc)A$$

This gives change in unit price ΔPd for the target group as

- 5)
$$\frac{-(Pd - Pc)A}{\lambda + A - C}$$
 assuming all increase consumption in this group.

6)
$$\Delta S = A - C = - \frac{(Pd - Pc)A(Pd)\epsilon(\lambda)}{\lambda + A - C}$$

7)
$$\lambda = \frac{(A - C)^2}{-Pd - Pc)A(Pd)\epsilon - (A - C)}$$

Note that this value is frequently negative implying that the subsidy scheme can not be funded by food aid alone. For example, suppose initial consumption was one, of which .2 were imports. If aid is .2 and $\Delta CI = -.1$, normalizing Pd at one, (consistent with our normalizing the value of initial consumption and subsequent food aid) even totally concessional aid would generate a negative value for λ at any absolute

value of price elasticity less than 1. While more price responsiveness would increase the ability of a subsidy scheme to work, aggregate own price elasticities for aggregate food consumption are not likely to be far out of the range of $-.1$ to -1 . With a less price responsive group one needs a greater amount of aid relative to decreased commercial imports for a self funding program to reach a non trivial portion of the population while maintaining producer prices at previous market levels.