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Food Subsidies in Developing Countries

Costs, Benefits, and Policy Options

EDITED BY PER PINSTRUP-ANDERSEN

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Preface

Governments of most countries attempt to influence the price consumers pay for food. In low-income countries the aim is frequently one of reducing consumer food prices below a free-market level. The results are what in this book is called consumer-oriented food subsidies. The goals of subsidy programs and policies vary among countries and over time and may include desires to improve the real purchasing power of all or certain groups of consumers, to reduce or eliminate calorie and nutrient deficiencies in low-income population groups, to maintain low urban wages, to assure social and political stability, and a number of other goals.

The design of subsidy policies and their implementation procedures vary widely among countries and include explicit price subsidies or food stamps targeted to selected population groups or food commodities, as well as explicit or implicit general price subsidies and food-related transfers with little or no targeting.

In some countries, consumer-oriented food subsidies place a heavy financial burden on either the government or food producers, while in others, subsidy costs are of little consequence to the government or farmers. Similarly, the benefits from food subsidies and their distribution as well as their cost effectiveness vary greatly among countries. Some subsidy programs greatly enhance poor people's purchasing power and nutritional status while others primarily benefit middle- and upper-income population groups. In some countries, consumer-oriented food subsidies are of such magnitudes that they exercise considerable influence in foreign trade, inflation, and the performance of the agricultural and other sectors, as well as on economic growth and equity in general.

The processes determining the effects of consumer-oriented food subsidies are complex, and reliable information on the effects of existing policies and programs and changes in these are often available only from relatively complicated analyses. Policy design and modifications based on simplistic reasoning may lead to disappointing results.

In spite of the widespread occurrence of consumer-oriented food subsidies in developing countries and their large magnitude in some of these countries, in-depth research aimed at assisting policymakers in estimating the effects of existing subsidies and predicting the effects of policy changes has been very limited.

It was against this background that IFPRI initiated a set of studies of food subsidies in collaboration with national institutions and individuals in several developing countries. These studies have now been completed. This book is based on the research, policy experience, and performance of subsidy policies and programs in more than a dozen countries in Africa, Asia, and Latin America. Most of the research was undertaken under the auspices of IFPRI during the period 1978–86. National researchers, government advisors, and policymakers from many countries, including those where studies were carried out, played a key role. Throughout the research, emphasis was placed on assuring a high degree of policy relevance and utility of research results for those responsible for making recommendations and decisions about subsidy-related policies and programs. For this purpose, interaction among analysts and policy advisors and decision-makers was pursued through frequent personal exchange of research findings and policy experience and expertise as well as through workshops and conferences. Such interaction also permitted the sharing of policy experiences across countries.

The purpose of this book is to summarize, synthesize, and interpret experience and findings from analyses of subsidy programs in various countries. Emphasis is placed on identifying lessons and relations believed to be of general validity and thus useful for policy analysts and policymakers concerned with assessment and possible modification or discontinuation of existing policies and programs or design of new ones both within and outside the countries studied.

It is not the purpose of this book to assess whether consumer-oriented food subsidies are good or bad or whether policies leading to subsidies are appropriate in specific countries. Although the studies reported here contributed to the formulation of policies in several countries, this book makes no recommendations for specific policy changes in specific countries. The actual choice and design of policies and programs most appropriate for a particular country must be based on a mix of economic, social, political, and cultural considerations. While this book may assist in assessing the consequences of policy options and thus help in assuring an informed debate about policy changes, it does not pretend to substitute for sound country-specific policy judgments regarding specific changes to be made.

The book is divided into four parts. A summary of available evidence about the effects of consumer-oriented food subsidies with emphasis on costs and benefits is provided first. Part two presents the results of the

syntheses across countries with respect to the effect of food subsidies on household incomes, income distribution, food consumption, and nutritional status of low-income population groups, as well as the implications for foreign trade, government expenditures, inflation, and other macroeconomic factors. Implications for the agricultural sector are also discussed along with syntheses of political considerations and lessons for program and policy implementation. Part two also presents a discussion of alternatives to food subsidies.

Findings from the individual country studies are discussed in part three, and the last part presents the implications of the findings for current and future food policies.

In addition to the authors of the various chapters, many persons and institutions contributed to the research reported in this book, including government officials and policymakers in the study countries, participants in two international workshops, and colleagues within IFPRI and collaborating institutions. In addition to IFPRI core funding, financial support for the research reported in this book was obtained from several sources, the principal ones being the United States Agency for International Development and the United Nations Development Program.

Preparation of the manuscript benefited greatly from the skillful assistance of Gaudencio Dizon, Phyllis Skillman, and Wendy Merrill.

PART I

Introduction

1 The Social and Economic Effects of Consumer-Oriented Food Subsidies: A Summary of Current Evidence

PER PINSTRUP-ANDERSEN

The social and economic effects of consumer-oriented food subsidies are wide ranging. While the immediate purpose may be relatively narrow—for example, assuring some or all consumers access to a given quantity of food at prices fixed by the government—the effects of subsidies may be felt in a variety of ways both at the household level and throughout the economy.

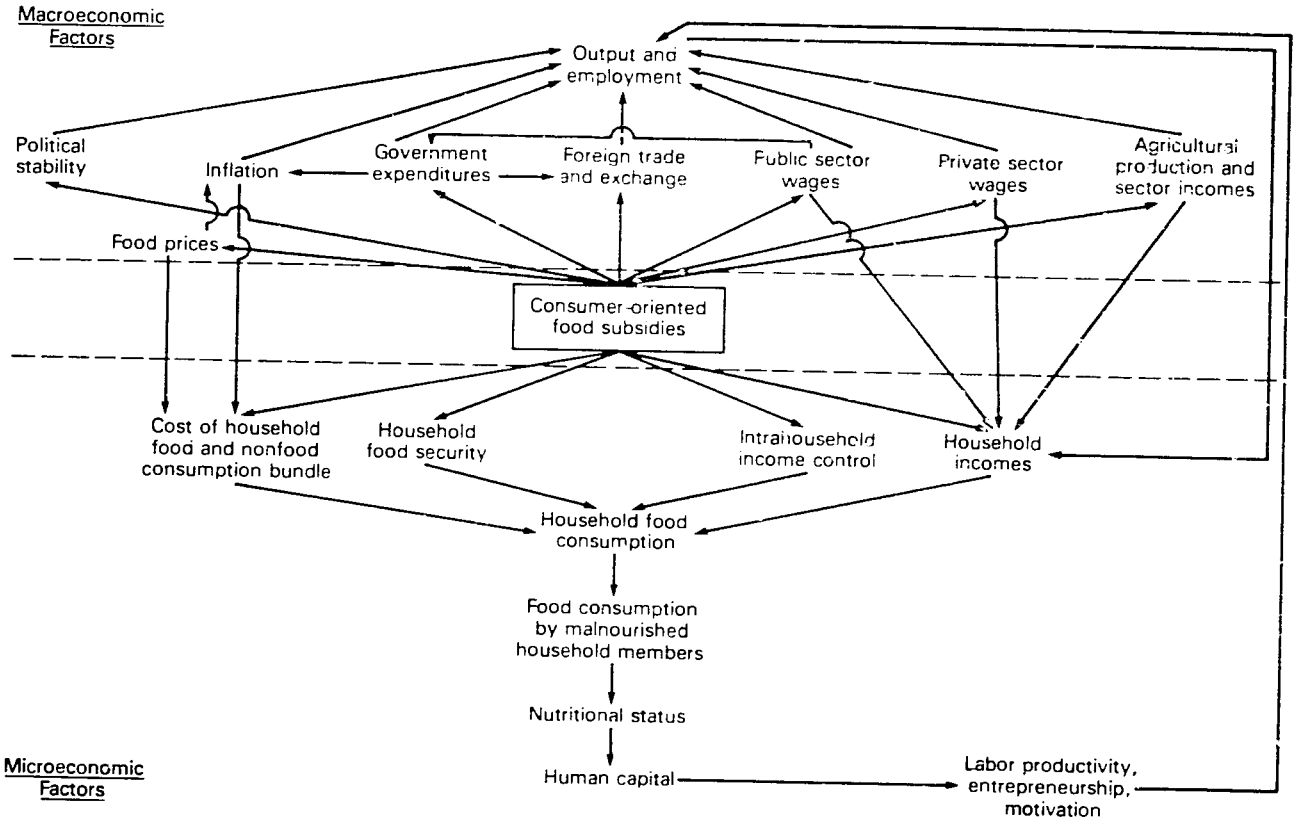
This chapter presents an overview of the most important potential effects in order to provide a framework for the rest of the book and summarizes the most significant empirical findings regarding these effects. The policy implications of the findings are discussed throughout the book and are summarized in chapters 23 and 24.

Figure 1.1 presents the factors and relations most likely to be affected by consumer-oriented food subsidies. For the purpose of presentation, a distinction is made between micro- and macroeconomic factors. The former refer to those factors that may be influenced by the individual household. The latter are either economywide or refer to groups of households while being beyond the influence of an individual household.

Each of these factors and relations will be discussed below in the light of available empirical evidence from studies and policy experience in a number of countries, including Bangladesh, Brazil, China, Colombia, Egypt, India, Mexico, Morocco, Pakistan, the Philippines, Sri Lanka, Sudan, Thailand, the United States, and Zambia. More detailed analyses of subsidy programs in nine of these countries are presented in chapters 11 through 22; chapters 2 through 10 provide more detailed syntheses of the findings with respect to the effect on the micro- and macroeconomic factors, shown in figure 1.1.

Table 1.1 presents an overview of some of the characteristics of the programs studied. Most of the programs and policies provide explicit—that is, government financed—food-related subsidies to consumers, while a few are based on implicit subsidies—that is, consumer subsidies financed by the agricultural sector through economic policies that make

FIGURE 1.1 Overview of the effects of consumer-oriented food subsidies



producer prices lower than they would otherwise be. Many of the foods that are explicitly subsidized also receive some implicit subsidy. A large majority of the programs provide price subsidies, while a few entail food stamps. In some cases, price subsidies are provided for the total quantity traded of one or more food commodities, most commonly wheat and rice, while in others, the subsidy is targeted, implicitly or explicitly, on certain population groups or limited to specified quantities or rations. Except for a few successfully targeted programs, such as the past food stamp program in Colombia and the food price discount experiment in the Philippines, the coverage of the programs is determined primarily by implicit targeting, which in most—but by no means all—cases is biased toward the urban population.

Effect on Food Prices

Consumer prices below open-market or border prices for one or more food commodities are a common feature of most consumer-oriented food subsidy programs. Price reductions caused by subsidy programs may be large. It is not uncommon to find that the subsidy reduces the consumer prices by half or more, as exemplified by subsidies for wheat, sugar, and beans in Egypt and edible oil in the Philippines.

The size of the subsidy may change considerably over time. Failure to adjust the subsidized prices along with general price increases has resulted in large increases in subsidy costs in some countries, notably Egypt and Morocco. Devaluation of local currencies is one occasion when the explicit subsidy is often increased to insulate consumers from the effect of higher domestic prices of imported foods. In this case, an explicit subsidy may be substituting for an implicit one.

Rapidly falling real prices of wheat, rice, and sugar in the international market during the first half of the 1980s provided the opportunity for reducing the real value of the price wedge on imported subsidized commodities and therefore for reducing the costs of the subsidies. As further discussed in the section on costs, this opportunity appears to have been seized by a number of countries (Pinstrup-Andersen, Jaramillo, and Stewart, 1987).

Because they spend a large share of their budget on food, the effects of changes in the food prices on purchasing power are larger among the poor than among the better-off population groups. Thus a decrease of 10 percent in food prices is likely to result in an increase of 6 to 8 percent in the real incomes of the poorest population decile, while the increase may be only 1 to 3 percent among the richest decile (Pinstrup-Andersen, 1985a).

TABLE 1.1 Characteristics of subsidy programs, selected countries

Country	Principal Foods Subsidized	Type of Subsidy
Bangladesh	Wheat and rice	Mainly explicit
Brazil	Wheat	Explicit and implicit
China	Rice	Explicit and implicit
Colombia[a]	Selected processed food	Explicit
Egypt	Wheat	Mainly explicit
Egypt	Rice	Implicit
Egypt	Sugar, tea, frozen meats, fish, and certain other foods	Explicit
India	Wheat and rice	Mainly explicit
Mexico	Maize and certain other foods	Explicit
Morocco	Wheat	Mainly explicit
Pakistan	Wheat	Mainly explicit
Philippines	Rice and oil	Explicit
Sri Lanka (up to 1977)	Rice	Mainly explicit
Sri Lanka (from 1979)	Rice	Explicit
Sudan	Wheat	Mainly explicit
Thailand	Rice	Implicit
United States	Several foods	Explicit
Zambia	Maize	Explicit and implicit

[a]Discontinued.

Effect on Household Incomes

The most important immediate benefit of food subsidies is the positive effect on real incomes of households with access to the subsidies. The income transfers occur partly through lower food prices (as already discussed) and partly through direct transfers in the form of food stamps.

As further elaborated in chapter 2, food subsidies account for a significant portion of real incomes of the poor in a number of countries. In several of the programs analyzed, the value of the food subsidies received by low-income households account for 15 to 25 percent of their total real incomes. As a general rule, better-off households receive larger absolute benefits than poorer ones. However, benefits as a percentage of current incomes are larger for the poor. Both the value and the distribution of benefits vary among program types and countries. This variation offers oppor-

Type of Program	Food Distribution	Actual Coverage (implicit targeting)
Price subsidy	Targeted and rationed	Mostly urban
Price subsidy	General	Total population
Price subsidy	General	Mostly urban
Food stamps	Targeted and rationed	Poor households with preschoolers or women who are pregnant or lactating
Price subsidy	General	Total population
Price subsidy	Rationed	Mostly urban
Price subsidy	Rationed	Total population
Price subsidy	Rationed	Total population
Price subsidy	General	Mostly urban
Price subsidy	General	Total population
Price subsidy	Rationed	Mostly urban
Price subsidy	Targeted and rationed	All households in areas selected for high level of poverty
Price subsidy	Rationed	Total population
Food stamps	Targeted and rationed	50 percent of population, biased toward the poor
Price subsidy	General	Mostly urban
Price subsidy	General	Total population
Food stamps	Targeted and rationed	Qualifying low-income households
Price subsidy	General	Mostly urban

tunities for increasing benefits or reducing costs of consumer-oriented food price subsidies through appropriate program choice and design, as further discussed in chapter 24.

The effect of food subsidies on real incomes of the poor depends on the nature of the subsidy scheme, including the degree of targeting, the choice of commodities to be subsidized, and the design and implementation of the distribution scheme. Targeting is a particularly important consideration, because it is a means of reducing fiscal costs without reducing the benefits obtained by the target group. Only a few of the existing food subsidy schemes in developing countries are effectively targeted to low-income households. Some of the schemes are targeted to urban households either explicitly through the issue of ration cards or implicitly by limiting the distribution of subsidized commodities to urban areas.

A strong urban bias was found in programs in China, Bangladesh, Mexico, and Pakistan but none in programs in Sri Lanka and Kerala, India. Furthermore, the distribution of benefits from the Egyptian food price and subsidy policies as a whole is slightly biased toward the rural sector, landless labor and small farmers being the principal beneficiaries in that sector (Alderman and von Braun, 1984).

Since food subsidies tend to place downward pressures on wages, the real income embodied in existing food subsidies may overestimate the net effect of subsidies on incomes after accounting for the wage incomes forgone. This is further discussed in the section on wage effects.

Finally, it should be emphasized that the net effect of subsidies on household incomes depends not only on the value of the subsidy received but also on the incomes forgone due to the financing of the subsidy. Unfortunately, explicit subsidies are usually not financed from earmarked revenue sources, and information is lacking about how the incidence of public sector revenues would change in response to changes in food subsidies.

Household Food Security

Household-level food security concerns are commonly found among the goals of subsidy programs.[1] Programs currently found in many developing countries—for example, ration shop schemes in India, Pakistan, and Bangladesh and some of the food subsidies in Egypt—were initiated for the purpose of assuring consumers (usually but not always urban consumers) access to a specified quantity of one or more food staples at prices fixed by the government. Many of these programs were introduced or expanded during wartime or following poor harvests or extreme foreign exchange crises. The principal purpose of the schemes when initiated was clearly one of reducing uncertainty at the household level concerning the ability to acquire a certain minimum amount of basic staples.

These programs frequently provide basic rations to households at fixed prices irrespective of household income. The implication is that price fluctuations are transferred from the consumers who obtain the rations to the government or to the rest of the market. Because of its traditionally large price fluctuations, the sugar market provides a good illustration of this point. While maintained at a constant nominal level throughout, domestic sugar prices to the Egyptian consumer varied from 22 percent of the international prices in 1974 to approximately parity in 1977, to 144 percent in 1978, and down to 29 percent in 1980 (von Braun and de Haen, 1983). Thus domestic sugar consumers were effectively protected from wide price fluctuations in the world market by being subsidized in some years and

1. Household-level food security is here defined as a measure of access to food over time.

taxed in others. Such protection is a key consideration for poor households, since price fluctuations are an important source of food insecurity. Other food subsidy schemes, such as food stamps with fixed nominal value, do not protect the consumer from price fluctuations, as exemplified by the current Sri Lankan food stamp program, in which the real value of the stamps has decreased dramatically since the beginning of the program in the late 1970s (chapter 18).

Periodic adjustments in the nominal value of food stamps could maintain their real value, and thus food stamps would be as effective as fixed quantity schemes in terms of long-term household food security. However, such adjustments require decisions that may be conveniently postponed—and were in fact postponed in food stamp programs in Sri Lanka and Colombia for the purpose of reducing costs. Furthermore, fixed nominal-value stamps do not protect the consumer from short-term price fluctuations even when they are periodically adjusted for inflation. The drawback of programs that assure the consumer a fixed quantity of food at a fixed price is that the effects of price fluctuations are transferred either to the rest of the market or to the government, causing fluctuations in fiscal and economic costs and influencing other parts of the economy.

In general, programs providing fixed-quantity rations, whether fixed per person or per household (for example, the Indian ration shop schemes) have been successful in reaching the population groups they were directed toward and in providing these groups with a constant supply of the rationed food at low prices. Targeting has not played a major role in these programs. Instead, the programs have been viewed as providing access to basic rations for all urban and, in some cases, rural households.

Findings from the case studies illustrate the difficulty of achieving both universal household food security (rationing) and targeted income transfer goals in one program in a cost-effective manner. The reason is that targeting, which is essential to achieve cost-effective income transfer to target groups, by definition excludes nontarget households from food security provided by the program. This conflict may, of course, be overcome if food security is sought only for those households targeted for transfers. However, this has not been the case in most subsidized rationing schemes.

Intrahousehold Income Control

One reason why income transfers are linked to food, whether through reduced food prices or food stamps, is a belief that the effect on food consumption will be larger than if the same real income was transferred in cash. While this is clearly true in the case of price subsidies for unlimited quantities--wheat subsidies in Brazil, Egypt, and Morocco; maize subsidies in Mexico—because they lower prices at the margin, the evidence is

mixed when it comes to food stamps and price subsidies limited to rations smaller than the quantities consumed in the absence of the subsidy—that is, inframarginal quantities.

Results from studies of two food stamp programs providing inframarginal subsidies (Sri Lanka and Colombia) show that the effect on household food consumption was not significantly different from the effect of wage incomes of the same magnitude. Similarly, a study in Puerto Rico found no difference in the marginal propensity to consume food from food stamps and cash transfers (Fraker, Devaney, and Cavin, 1986).[2]

There is evidence from other studies, however, that the marginal propensity to consume food varies with income source. Thus results from a Philippine study indicate that the income transfer embodied in food subsidies for inframarginal rations have a larger effect on household calorie consumption than an equal amount of wage income (Garcia and Pinstrup-Andersen, 1987). Similarly, Senauer and Young (1986) in a study of the U.S. food stamp program found that the marginal propensity to consume food increases with increasing share of total household incomes originating from food stamps. One possible explanation for different marginal propensities among income sources is that the intrahousehold budget control is a function of the source of income and that the marginal propensity to consume food varies among members of a household. For example, Kumar (1979) found that in Kerala, India, the marginal propensity to consume food varied among women's incomes, men's incomes, and in-kind incomes from home gardens. Other reasons are discussed in chapter 2.

Household Food Consumption

Food consumption by low-income households is influenced by food subsidies through changes in food prices, household incomes, household food security, and possibly through changes in the intrahousehold income control, as discussed above.

Both income and price elasticities for staple foods tend to be large in absolute value among the poor (Alderman, 1986; and Pinstrup-Andersen, 1985a). This implies that food price subsidies—whether limited to certain rations or not—are likely to result in increasing household food consumption. This is borne out by empirical evidence from the case studies.

However, in the case of subsidies on individual foods, the increase in the consumption of subsidized foods is not fully reflected in household energy and protein consumption because of changes in the diet composition. The degree of substitution among foods consumed in response to changes

2. The marginal propensity to consume food is a measure of the change in food consumption associated with a change in incomes of one unit of currency.

in relative prices appears to be higher among the poor than previously believed (Alderman, 1986). This implies that the adjustment in the consumption of the subsidized food in response to the subsidy (the direct price elasticity of demand) is a poor indicator of the adjustment in total energy or protein consumption.

The subsidized ration-shop scheme in Sri Lanka increased daily energy consumption by 63 calories per capita on the average and by 115 calories among the poorest decile (Gavan and Chandrasekera, 1979). A pilot food price subsidy scheme in the Philippines increased average daily calorie consumption per adult equivalent unit by 130 calories (Garcia and Pinstrup-Andersen, 1987). Ahmed (1979) estimated that low-income urban consumers in Bangladesh consumed about 250 calories more per person daily due to the rations. And George (1985) estimated that the poorest Indian consumers increased their calorie consumption up to 18 percent. This is similar in magnitude to the effect of the Sri Lankan food stamp program, which was estimated to have increased calorie consumption among the poorest population decile by 15 percent in 1981 (Edirisinghe, 1987). Finally, data from a study by Rogers (1981) in Pakistan illustrate the differential effect in urban and rural areas of programs that are urban biased. She found that the Pakistani ration-shop scheme increased the daily per capita calorie consumption of the urban poor 114 calories but for the rural poor, only 16 calories.

The choice of commodity as the carrier of the subsidy is important, as illustrated by Williamson-Gray (1982) for Brazil. She found that the current wheat bread subsidies caused a slight decrease in total calorie consumption by the poor because the increased bread consumption was associated with larger decreases in the consumption of rice and other foods through substitution. Shifting the current government outlays on wheat subsidies to rice would greatly increase total calorie consumption by the poor.

Food Consumption by Malnourished Individuals

It is often assumed that expanded household food consumption results in higher food consumption by malnourished household members. However, very little is known about the effect of food subsidies on intrahousehold food distributution and on individual consumption.

Evidence concerning the effect of subsidy programs on food consumption by preschool children is available from Mexico (chapter 9) and the Philippines (Garcia and Pinstrup-Andersen, 1987). In both cases the effect was positive and significant. In the case of Mexico, the increase in the consumption of milk (the subsidized commodity) by preschoolers was partially offset by their decreased consumption of other commodities. Furthermore,

in both cases calorie consumption by other household members increased significantly due to the subsidies. In the Philippines, a disproportionately large share of the net increase in household food consumption went to adults, although the goal of the program was to increase food consumption by preschoolers. Although this implies large leakages from the point of view of program goals, the households that received the subsidies were very poor, and all groups of household members, including adult males, were calorie deficient.

Nutritional Status

The extent to which increases in household food consumption lead to improved nutrition depends on the degree to which malnourished household members share in the increase and on the importance of food deficiencies (as opposed to such factors as infectious diseases, diarrhea, parasites, and poor sanitary conditions) in existing nutrition problems. If food deficiencies are not the most limiting constraint to improved nutrition, increased food consumption may have little or no effect. In Egypt, for example, partly due to existing food subsidies, food consumption is high even among the poor, and while malnutrition is significant, the critical constraint to improved nutrition appears to be poor sanitation and diarrhea rather than lack of food.

There is very little direct empirical evidence on the effect of food subsidies on the nutritional status as measured by anthropometry. Kumar (1979) found that the weight for age of children in Kerala would fall by 8 percent if the ration scheme was discontinued. Similarly, results from a pilot food price subsidy scheme in the Philippines showed a positive effect on the weight for age of preschoolers (Garcia and Pinstrup-Andersen, 1987).

Human Capital

Food subsidies may contribute to the formation of human capital by reducing food prices or by making more income available for the poor to purchase health services, nutrition, education, and training. Improved human capital, in turn, is expected to result in increased labor productivity, expanded entrepreneurship, and higher incomes. A number of studies have shown positive effects of health and nutrition improvements on labor productivity. While some of these studies suffer from methodological deficiencies, others appear to provide reliable evidence of positive effects (Latham, 1985; and Strauss, 1985). As illustrated by a study in Chile (chapter 5), the economic rate of return from investment in human capital through food subsidies may be high. If programs can be designed to assure

such high returns, food subsidies may contribute to, rather than dampen, economic growth.

Fiscal Costs

The magnitude of government costs is a key consideration in most food subsidy programs. Thus while benefits are important, the feasibility of a program is determined in large part by its fiscal cost.

The fiscal cost of a subsidy program depends on the magnitude of the total subsidy and the distribution of cost between the government and the agricultural sector. Untargeted, explicit consumer-oriented food subsidies are usually very expensive, as exemplified by the Egyptian food subsidies, the cost of which has been around U.S. $2,000 million annually during the first half of the 1980s. This corresponds to 16 to 18 percent of total government expenditures (Pinstrup-Andersen, Jaramillo, and Stewart, 1987). On the other hand, government costs of highly targeted subsidy schemes, such as the discontinued food stamp program in Colombia, may be low.

Fiscal costs of food subsidies in many of the countries studied increased during the early 1970s. This increase was primarily due to attempts to protect domestic consumers from the adverse effects of rapidly increasing food prices in the international market. As real prices returned to a decreasing trend around mid-1970, so did the real fiscal costs of food subsidies in most but not all of the countries studied. In some (for example, Sri Lanka, Egypt, and Morocco), expansions in the subsidies continued along with falling real prices resulting in real increases in the fiscal costs of food subsidies up through the latter half of the 1970s.

Since 1980, real fiscal costs have decreased in most countries whether measured in absolute terms or as a percentage of total government expenditures or gross domestic product (Pinstrup-Andersen, Jaramillo, and Stewart, 1987). While these decreases were due largely to falling real prices of food procured by the government, a few countries—notably Sri Lanka—made explicit cost-saving modifications in the subsidy programs, including a shift from ration shops to food stamps with a fixed nominal value, liberalization of food prices, and exclusion of about half the population from the program. These modifications reduced fiscal costs from more than 15 percent of government expenditures during the late 1970s to less than 3 percent in 1985 (Edirisinghe, 1987).

The Sri Lankan experience illustrates two approaches to reducing fiscal costs—with very different effects on the poor. One is targeting on the poor and the other is reducing the real value of the subsidy received by a target household. While both may be very effective in reducing fiscal costs, the latter results in reduced benefits for the poor while the former need not. These reductions may be severe, as illustrated in Sri Lanka, where the

real value of food stamps has decreased rapidly since 1979 due to large price increases and a fixed nominal value of the stamps. The negative effect on food consumption and nutrition among the poor has been severe (Edirisinghe, 1987; Cohn, 1986).

As pointed out by Scobie (chapter 4), high fiscal costs do not necessarily mean inefficient allocation of resources. The critical issue is whether the stated goals of the subsidies could be achieved at a lower economic cost. Therefore the cost effectiveness relative to alternative means to reach the goals and the effect of the fiscal costs on economic efficiency are key factors.

The evidence from the country studies clearly show that the untargeted or poorly targeted food subsidy programs found in most countries are not the most cost-effective means to reach the goals of transferring incomes from better-off to poor households, improving food consumption among the poor, or improving their nutritional status. This does not mean these programs have not been effective in reducing poverty and improving food consumption and nutrition among the poor. Many of them have. But it means that these accomplishments could have been achieved at much lower fiscal and economic costs.

Some of the programs—for example, the ration-shop schemes in the Indian subcontinent—appear to have been rather cost effective in improving household food security, particularly among urban households. Also, although formal analysis on this matter is very limited, it is possible that political goals—including social and political stability and rent seeking by groups in power—have been achieved through food subsidies in a cost-effective manner. Furthermore, in some countries, food subsidies may have made a cost-effective contribution to the maintenance of the existing social contracts. Whether or not political gains have been captured in a cost-effective manner, experience from a number of countries, including Morocco, Tunisia, Egypt, and the Dominican Republic, clearly shows that, once introduced, food subsidies are difficult to abolish. The strong opposition to reduction in or elimination of existing food subsidies implies that some population groups capable of expressing their discontent are benefiting; but it says nothing about the cost effectiveness.

Regarding the effects of food subsidies on economic efficiency, the most important are probably those on inflation, foreign trade and exchange rates, market distortions, and investment. These are discussed below. The opportunity cost of the fiscal resources and the sources of financing the subsidies are important considerations. Foreign food aid has been an important source of financing for many of the larger programs, including those in Bangladesh and Egypt. However, except for food aid, it is difficult or impossible to link subsidy costs to specific revenue sources, because subsidies are financed out of the general treasury. Furthermore, it is

not clear from available information how the funds used for explicit food subsidies would have been spent in the absence of the subsidies. Lack of evidence regarding the incidence of the fiscal revenues used to finance explicit subsidies makes an estimate of the net distributional effects incomplete. Finally, it should be noted that explicit food subsidies have made it possible for some governments—for example, those of Egypt and Bangladesh—to keep wages lower in the public sector by providing what might be viewed as in-kind payment in the form of food subsidies. Where this occurs, existing estimates overstate the net fiscal cost of subsidies. This is illustrated by Edirisinghe (chapter 18), who estimated that a large share of the savings in fiscal costs associated with a shift from untargeted ration shops to targeted food stamps in Sri Lanka was spent on increasing wages in the public sector to compensate for the losses in subsidy benefits.

Effect on Wages

Since most food subsidies are linked to staples—that is, wage goods—a depressing effect on wage rates would be expected. If this occurs, benefits to consumers are less than the value of the transfer, and existing estimates overstate consumer benefits. The subsidies may be viewed in part as wage subsidies, with a corresponding positive effect on employment and economic growth.

The extent to which benefits or costs from food price changes are captured by consumers rather than passed on in the form of lower or higher wages varies among countries, and empirical evidence is scarce. The period of adjustment of wage rates is likely to vary depending on institutional and other aspects. Informal interaction with policymakers in several countries, including Egypt, Sri Lanka, and Bangladesh, indicates that public sector wages would be adjusted if food subsidies were changed. As mentioned above, such adjustments were in fact made in Sri Lanka when the subsidies were changed in the late 1970s (chapter 18). Pending additional empirical evidence, it may be concluded that the long-run positive effects of food price decreases on real incomes of poor wage earners are smaller than the immediate effects. However, Scobie (chapter 4) concludes that the effect on wage rates is "likely to be swamped by the real income effects."

Effect on the Agricultural Sector

The effect on the agricultural sector varies greatly among the programs, depending on agricultural price and procurement policies, price-depressing effects of imports and food aid, degree of subsidy targeting, supply response, and a series of fiscal and macroeconomic relations. While

foodgrain subsidies in India and Bangladesh were supported in part by domestic procurement at relatively low prices, the ration-shop schemes in Sri Lanka were managed alongside relatively high producer prices, thus requiring higher rates of government subsidies. In Mexico, producer and consumer price subsidies for maize coexisted during some years. Price policies for wheat in Brazil resulted in a shift from producer to consumer subsidies over a period of a few years. In Egypt, rice price subsidies are financed totally by the producers, while the Egyptian government and consumers finance meat and livestock subsidies to the producers. Implicit taxation of wheat producers in Egypt through low procurement prices was reduced in the late 1970s and early 1980s, while food subsidies grew along with the improved foreign exchange situation. The burden of financing low food prices for consumers was gradually shifted from agriculture to the government. This shift may be reversed if the foreign exchange situation worsens or the availability of external food aid is reduced.

Thus there is no consistent pattern among the programs with respect to the effect on the agricultural sector. It is clear, however, that explicit consumer food subsidies need not have adverse effects on agricultural incentives. On the contrary, such subsidies enhance the purchasing power of consumers who, in turn, increase their demand for food and thus provide opportunities for increasing prices to the producers. Implicit consumer food subsidies, on the other hand, are likely to be harmful to producers because they are usually maintained through artificially low producer prices, which in turn result in lower production and lower farm incomes. Countries having explicit subsidies frequently also have implicit ones, and the effect of each of these on agricultural incentives is often confused.

A negative effect may occur if government expenditures on explicit subsidies would have been spent on public investment in agriculture—for example, agricultural research and technology, irrigation, and infrastructure—in the absence of the subsidy. The study of Egyptian food subsidies (chapter 13) found that, while gross fiscal support of the agricultural sector increased with increasing fiscal costs of the food subsidies during the 1970s and early 1980s, the share of public investment in agriculture was reduced. It is not clear whether the reduction was caused by increasing food subsidies.

Effect on Inflation

Whether and to what extent explicit food subsidies influence the rate of inflation depends on the way they are financed. As already discussed, it is very difficult or impossible to identify the specific source of subsidy financing within government revenues. If it is assumed that changes in subsidy costs will be reflected in similar changes in government deficit spend-

ing and that deficit spending is financed through increased money supply (a reasonable assumption in some but not all cases), then the subsidies will cause inflation. Thus while the prices of the subsidized goods are kept low, the prices of other goods will increase and the net benefits derived by consumers will be lower than the value of the transfer. This effect is often overlooked in the debate regarding food subsidies. In fact governments often justify subsidies in part as a measure to control inflation by keeping food prices low. The apparent contradiction originates from a confusion between a one-time change in the prices of certain commodities caused by subsidies and a continued rate of change in the general price level caused by monetary expansion to finance the subsidies (chapter 5).

Empirical evidence of the inflationary effects of food subsidies is scarce. Results from Egypt and Korea indicate that the effect can be large (chapter 5). Thus Scobie (1983) found that a 10 percent increase in food subsidies in Egypt would result in a 5 percent increase in the rate of inflation.

Effect on Foreign Trade and Exchange

The effect of food subsidies on foreign trade depends on the nature of the subsidy programs and other existing economic policies. Reduced consumer prices result in increased demand, which is often met through expanded imports. In the case of general price subsidies, the resulting increases in imports may be very large, as exemplified by wheat in Egypt and Brazil (chapters 13 and 19). Furthermore, import demands associated with subsidy programs that fix consumer prices for an extended period of time do not easily adjust to price fluctuations in the international market. In the absence of adjustments in quantities imported, the variation in the cost of importing subsidized foods increases. This is reflected in the availability of foreign exchange for other imports. Scobie in a study of Egypt (chapter 13) estimated that a 10 percent increase in the cost of imported food would result in a fall of 1 to 2 percent in industrial output as importation of raw materials is reduced to provide the necessary foreign exchange for food imports.

Implicit subsidies have an even stronger effect on foreign trade because, in addition to increased demand, they tend to reduce domestic supply through lower producer prices, thus reducing self-sufficiency. Some countries—for example, Thailand (Trairatvorakul, 1984)—maintain implicit consumer subsidies through export taxes, thus reducing production and exports while keeping domestic prices low. The effect of implicit consumer subsidies on production, export, and self-sufficiency may be severe, as illustrated by rice in Egypt, the export of which has steadily declined from relatively large quantities to the point of making Egypt a net rice

importer. Decreasing exports or increasing imports increase demand for foreign exchange and pressures on the exchange rate. Such pressures may also occur due to the financing of explicit subsidies.

Effect on Output and Employment

Food subsidies may influence national economic growth and employment in a variety of ways—through price distortions and reduced investment in the agricultural and other sectors, through improved human capital, through the effect on wages and inflation, or through the availability of foreign exchange for import of captial goods and raw materials. The net effect on output may be positive or negative. A number of analyses based on general equilibrium models (Eckaus and Mohie El-Din, 1980; McCarthy and Taylor, 1980) have concluded that reductions in existing food subsidies would cause significant reductions in real output. However, because of certain assumptions and rigidities of these models, estimates of macroeconomic consequences of food subsidies may be misleading, and Scobie (chapter 4) concludes that "there is no evidence that expenditure on food subsidies impedes or fosters output and growth. The answer hinges on other distortions and accompanying policies."

PART II

Syntheses of Findings

2 The Effectiveness of Consumer-Oriented Food Subsidies in Reaching Rationing and Income Transfer Goals

PER PINSTRUP-ANDERSEN AND
HAROLD ALDERMAN

The goals of consumer food subsidies vary among countries and over time. Analyses of food subsidies in a number of countries reveal that one or both of two goals are commonly found. These are (1) to assure that all or certain groups of households—frequently urban ones—have access to a specified minimum quantity of staple foods at "reasonable" prices, and (2) to transfer incomes to certain population groups through lower food prices or food stamps. In this chapter these two goals will be referred to as rationing and income transfer.

Although the relative importance of the two goals varies among countries, one or both are clearly of great importance in virtually all past, current, and planned consumer food subsidy programs in the developing world. In order to assist policymakers in their efforts to assure cost effectiveness in subsidy programs—or alternative measures to reach rationing and transfer goals—this chapter synthesizes and interprets experiences and findings from analyses of subsidy programs in various countries and attempts to identify program elements and relations that influence cost effectiveness.

Food Subsidies and Rationing

Food subsidy programs currently found in many developing countries were initiated for the purpose of assuring consumers—usually but not always urban consumers—access to a specified amount of one or more food staples at prices fixed by the government. Many of these programs were introduced during wartime or following poor harvests or extreme foreign exchange crises. The rationale was frequently more in terms of quantity planning than of price policy. The ration-shop schemes in India, Pakistan, Bangladesh, and Sri Lanka (now discontinued) fall into this category, along with some of the food subsidies in Egypt. The principal purpose of these schemes was clearly to reduce uncertainty at the individual house-

hold level concerning ability to acquire a minimum amount of basic staples.

These programs frequently provide basic rations to households irrespective of income level and are important components of local marketing infrastructure. The ration size is usually based on household size and age composition. Food rations in Egypt have reached more than 90 percent of the population in urban as well as rural areas (Alderman and von Braun, 1984). The subsidized food distribution system in Kerala, India, was designed to provide a fixed allowance of rice to every individual, except food-grain producers, at a subsidized price irrespective of income level (Kumar, 1979). Similarly, up until recently, sugar rations were available to virtually all households in Pakistan, while wheat rations are not available in areas where wheat is produced in surplus (Rogers, 1978).

Ration schemes have also been used as part of policies to stabilize prices and insulate the domestic economy from price fluctuations in the international market. Thus when international wheat and rice prices skyrocketed during 1973–74, the price of wheat and rice rations in Bangladesh increased much less. As a result, the ration price of rice fell to about 24 percent of the open-market price, compared to 37 percent the year before and more than 70 percent during the mid-1970s (R. Ahmed, 1979). Sugar prices in Egypt provide another illustration: domestic sugar prices to the Egyptian consumer, while constant in nominal terms, varied from 22 percent of the international prices in 1974, to approximately parity in 1977, to 144 percent in 1978, and down to 29 percent in 1980 (von Braun and de Haen, 1983).

There are many reasons why governments may wish to control prices and assure household access to certain quantities of basic staples. Periodic food shortages or rapidly increasing food prices create social and political instability and can cause severe hardships for poor consumers. A lack of government confidence in the private food marketing system, including a perceived risk of speculative and exploitative behavior of marketing agents, may lead to direct government intervention. Furthermore, governments may wish to keep prices low for commodities generally believed to be good indicators of inflation and purchasing power, such as rice in many Asian countries and meat in parts of Latin America.

Ration schemes need not involve large price subsidies. Their success depends on whether they are able to assure households access to a certain amount of staples on a regular basis at reasonable prices. Indeed, when quantity restrictions limit imports, the domestic price of the rationed good may exceed the import price. This was observed in Egypt and Sri Lanka in the 1970s. Even in such cases, however, the ration price will not exceed the price that the same import quota would command on the open, or black, market.

Ration systems are seldom flexible in the face of changing economic conditions. Programs to stabilize the price of a certain ration often become permanent subsidies. Whether or not governments wish to do so, it is often politically difficult to increase the price of the ration at the same rate as the increase in nominal prices in the open market. The results are falling real prices of the rations, increasing subsidy, and higher government costs. The risk of an increasing gap between ration and open-market prices is particularly high in cases of local currency devaluation and rapidly increasing international prices for the rationed commodity.

Rationed commodities in Egypt are a case in point. While the consumer price index tripled during the 1970s, the nominal price of sugar and rice rations stayed constant (Alderman, von Braun, and Sakr, 1982). Similarly, although the price of the rice ration in Bangladesh increased from the mid-1960s to the mid-1970s, the increase was considerably less than the increase in open-market rice prices (R. Ahmed, 1979). Some countries with large ration schemes—for example, Sri Lanka up to 1979—have, however, not experienced such increasing gaps between ration and open-market prices (Gavan and Chandrasekera, 1979).

How successful have consumer food subsidy programs been in reaching rationing goals and what are the key conditions for success? Two indicators of success may be applied: first, the proportion of the target population covered and the cost; second, the extent to which the households covered were actually assured a fixed quantity at a reasonable price.

In general, programs providing fixed-quantity rations, whether fixed per person or per household, have been successful in reaching the population groups they were directed toward and in providing these groups with a constant supply of the rationed food at low prices. In many cases, that is achieved by using the private sector as the final outlet in the distribution network, as exemplified by the Egyptian and Pakistani ration schemes. However, some programs did not reach the population groups most in need. For example, food subsidies in Bangladesh benefited primarily urban consumers, even though a large majority of the absolute poor is found in rural areas (chapter 15). In some cases (including rural Pakistan and Bangladesh), the poor do not always draw the full quota to which they are entitled, most likely reflecting cash constraints and the costs of visiting ration centers. On the other hand, some programs, such as wheat flour rations in Pakistan, appear to have been most beneficial to low-income households (Khan, 1982), while in others, such as rice subsidies in Kerala, the poorest appear to have benefited less than the better-off consumers (Kumar, 1979). The reasons for such differential benefit distribution will be discussed later.

Food Subsidies and Income Transfers

Consumer food subsidies may be important income transfer mechanisms, thus influencing absolute as well as relative income distribution among population groups. In some cases, such income transfers are an explicit goal of subsidy programs; in others, the transfers are an outcome of subsidy policies pursued for other reasons. Income transfers through low consumer prices of foods may be pursued to strengthen the purchasing power of low-income consumers or to keep wages low. In some countries, food subsidies cause transfers from agriculture to the nonagricultural private and public sectors through low producer and consumer prices and corresponding low wages both within and outside agriculture; in others, the costs of the subsidies are covered by government outlays.

The size of the income transfers and the distribution of benefits and costs among population groups vary among programs, depending on the nature of the subsidies. Furthermore, the amount of income transfer captured by a particular population group may change over time due to adjustments in the economy. For example, the net gains to wage-earning consumers from a new food price subsidy may decrease over time if wages adjust to the lower food prices. Most of the available evidence on the effects of consumer food subsidies on income distribution refers to the short term. Very little is known about net effects after adjustments in wages and employment and other relevant economic factors have taken place. This section is focused primarily on the short-term effects; the effect of food prices on wages is discussed in chapters 4 and 22.

Distribution of Transfers Among Income Groups

Consumer food subsidies may account for a large share of the purchasing power of consumers. Because poor consumers spend a large proportion of their incomes on food, low food prices are particularly beneficial to them. There is evidence from a number of countries that food subsidies have significantly increased incomes among the poor, particularly but not exclusively among the urban poor. Thus a study of an earlier Sri Lankan food ration-shop scheme "indicates that the scheme contributed to a better standard of living among low-income groups and a more even pattern of consumption and relative income distribution throughout the society" (Gavan and Chandrasekera, 1979). The subsidized ration scheme that existed in Sri Lanka until 1979 contributed 16 percent of total incomes of the poorest 10 percent of the population in 1978/79 but less than 2 percent of incomes of the richest half of the population. The food stamp program that replaced subsidized rations contributed a slightly smaller but still very sig-

nificant proportion (14 percent) of total incomes of the poorest 10 percent in 1981/82 (chapter 18).

Research on the food ration shops in Kerala, India, shows that about half of total incomes of low-income families was accounted for by ration income, and the author concludes that "the removal of rationing would have a very serious impact on these low-income consumers" (George, 1979). Kumar (1979) found that rations supplied the bulk of rice eaten by low-income groups in Kerala and that the subsidy scheme "greatly improved the distribution of income." She further concludes that the "subsidy program was effective in raising nutrition and consumption levels of the poorest households and was more effective than other forms of direct resource transfers." In a study of the ration shops in several Indian states, George concludes that, for India as a whole, about two-thirds of the subsidies are obtained by households with annual incomes below Rs 3,600, another 20 percent by households with incomes between Rs 3,600 and 4,800, and the rest by households with higher incomes (chapter 16). The relative share of the subsidies received by the poor varies considerably among states. Thus in Kerala, the poorest 59 percent of the population received 87 percent of the subsidized grain, while in Tamil Nadu, the poorest 65 percent received only half of the subsidy. In Gujarat, the share of the subsidy received by the poor was equal to their share of the population (chapter 16).

The distribution of the benefits of food price subsidies may vary among groups of poor households, as illustrated by Trairatvorakul (1984) for Thailand. Increases in rice prices by 50 percent through reductions in export taxes and associated consumer price subsidies would increase the percentage of urban households below the poverty line from 8 to 13, while reducing the percentage of rural household below the line from 28 to 27. However, certain rural poor would experience large losses, while others would gain.

In Pakistan, subsidized food rations had a very limited effect on incomes of the rural poor in general, while the urban poor gained more than 10 percent of their real incomes from these subsidies (chapter 17).

In a study of the food ration-shop scheme in Bangladesh, R. Ahmed (1979) concludes that "rationing has aided the urban poor quite successfully, since without it the consumption levels of the poorest 15 percent of the urban population would have been 15 to 25 percent lower in 1973-74 than they were." A strong urban bias was found in food subsidies in Bangladesh. Thus while most of the poor people reside in rural areas, two-thirds of the subsidized grain was distributed to urban areas. Yet the study concludes that expanding the rationing program in the rural areas would be extremely expensive and would, if based on external food aid, cause

strong downward pressures on domestic food prices and disincentives to domestic producers.

A strong urban bias was also found in food subsidies in China, where it is estimated that only 10 percent of the benefits were captured by the rural population (Lardy, 1983). Urban bias, however, is far from universal. For example, no urban bias was found in the previous ration-shop and the current food stamp programs in Sri Lanka, in the previous Colombian food stamp program, and in ration shops in Kerala.

Similarly, the distribution of benefits from the Egyptian food price and subsidy policies as a whole is not biased toward urban dwellers. Some of these policies, such as those involving public food distribution, do have an urban bias, while others, such as price policies for meat, have a strong rural bias.

Subsidies associated with public food distribution in Egypt account for 6 percent of household incomes in urban and 7 percent in rural areas (chapter 11). The transfer to urban households exceeds the transfer to rural households by about 50 percent. The absolute value of the subsidy is slightly higher for upper- than for lower-income households in both urban and rural areas. However, the poor receive a much larger percentage of total income from subsidies than do the rich. Thus food subsidies account for about 16 percent of the incomes of the poorest quartile of the population but only about 3 percent for the richest quartile. These findings illustrate a feature common to most untargeted food subsidy programs: the absolute value of consumer benefits from food subsidies is higher for the rich than for the poor, while the benefits account for a larger percentage of total incomes of the poor than of the rich.

Government intervention in food pricing outside public distribution channels in Egypt resulted in negative subsidies to urban households and positive subsidies to rural households. The negative subsidies to urban dwellers are due to policies that keep meat prices to producers and consumers above free-market prices. The net transfer from all food subsidies (public distribution and open-market price policies) to the poorest quartile of the urban population was estimated to be about 13 percent of their incomes, while the richest quartile experienced a small net loss. Urban households as a whole gained about 3 percent of their incomes from these price policies. The rural poor gained 17 percent of their incomes and the rural rich about 3 percent, with an overall average of 6.7 percent for all rural households. Landless labor and small farmers were the principal beneficiaries. Thus contrary to common beliefs prior to the study, a rural rather than an urban bias was found for the food price and subsidy policies as a whole (chapters 11 and 12).

The income transfer effects of consumer food subsidies depend on the type of subsidy scheme—whether the subsidy is given as a price discount or

as a direct income transfer such as food stamps. It also depends on which commodities are subsidized,[1] whether the scheme is targeted to specific population groups, and how the scheme is implemented.

The importance of the choice of commodity and commodity quality in price subsidies is illustrated by evidence from studies in Brazil, Egypt, Mexico, and Pakistan. In the Brazil study, it was found that a shift of explicit subsidies from wheat to rice would lower incomes to the rich, increase incomes of the middle-income group slightly, and slightly lower incomes of the poor. Shifting the subsidy to milk would result in a large decrease in incomes of the poor and a corresponding increase for the rich. The opposite would occur if the subsidy were shifted to cassava (Williamson-Gray, 1982). Thus if the goal is to transfer purchasing power to the poor through a fixed government outlay on food price subsidies, the choice of commodity is important. Similarly, commodity choice is important if nutritional improvements are a goal (chapter 3).

Findings from the Egypt study show that subsidies on bread are more beneficial to the urban poor than subsidies on wheat flour, while the opposite is the case for the rural poor (Alderman and von Braun, 1984). A study for Bangladesh concludes that distribution of sorghum at the ration shops would provide larger relative gains to the poor than currently distributed rice and wheat, because sorghum is acquired almost exclusively by the poor (Karim, Majid, and Levinson, 1980).

A study of maize subsidies in Mexico provides further insights into the importance of the choice of product to be subsidized (chapter 20). In Mexico, maize prices to producers are supported through a policy of government price guarantees, while consumer prices of tortillas—a commonly consumed processed maize product—are subsidized. The price of unprocessed maize for final consumption purposes, however, is not subsidized. Although maize is a basic staple for both urban and rural households, the former usually buy subsidized tortillas while the latter make tortillas at home and thus do not benefit from the subsidy.

Limiting price subsidies to products that are perceived to be inferior offers another possibility for altering the transfer patterns in favor of the poor. In Pakistan, distribution of subsidized wheat flour with a high extraction rate is a case in point (Rogers and Levinson, 1976). In a study of wheat flour consumption in Rawalpindi City, Khan (1982) found that, although subsidized wheat flour was available to all consumers, its purchase

1. Income elasticities for individual commodities provide a rule of thumb regarding the distribution of benefits from untargeted single-commodity subsidies. If the income elasticity of the subsidized good is negative, the subsidy to the poor will be higher in both relative and absolute terms. If it is positive and less than one, it will be relatively higher for the poor but absolutely higher for the rich. If it is greater than one, then greater shares and greater amounts will go to the rich.

decreased from more than thirty kilograms per month for poor households to about twenty kilograms per month for the highest income households, while purchases of nonsubsidized wheat flour from the open market increased from about sixteen kilograms per month for the poor to fifty-eight kilograms per month for the highest income group. Thus the perceived low quality of the subsidized commodity resulted in self-targeting to the poor.

In some countries—Egypt and Zambia, for example—subsidies on transport are used to keep prices of certain foods uniform within the country. Although such policies are allocatively inefficient, they are in effect geographically targeted subsidies that influence relative income distribution.

Distributional Effect of Sources of Financing

The net transfer effects of a subsidy program depend on the manner in which it is financed. In cases where subsidies are available to most or all the population irrespective of income level, the most important income distribution effects may occur as a consequence of the distribution of the subsidy financing burden. Unfortunately, there is little information on the marginal sources of public sector revenues for most countries. Few developing countries derive a significant share of their total revenue from progressive income or payroll taxes.

In the study by Binswanger and Quizon (chapter 22), the distributional effect of various subsidies is shown to differ according to the source of financing. However, financing for subsidies is seldom distinguished from overall budgetary concerns, and it is frequently difficult or impossible to determine which part of total government revenues covers the cost of explicit food subsidies or how savings associated with a reduced subsidy bill would be spent.

Some sources of revenue, such as profits from public sector enterprises and foreign aid, may have little direct effect on income distribution. However, when used for current consumption rather than investment, they influence intergenerational distribution of incomes. To the degree that subsidies improve health and nutrition, they may be considered productivity-increasing investments in human capital rather than consumption. Loans needed to cover subsidy costs also represent a claim on future generations. Furthermore, deficit financing may influence inflation (chapter 4). Inflation generally favors owners of assets and fixed debts and harms individuals with fixed salaries or pensions. However, if a larger percentage of the purchases of the poor are subsidized with fixed prices, subsidies may shift the burden of inflation toward middle-class consumers.

Some governments follow cheap food policies through implicit rather than explicit taxation. Such policies, which include various combinations

of exchange rate manipulations, domestic price fixing, export taxes, forced food procurement, and government monopolies in foreign or domestic food trade, also have distributional effects. Combined with similar measures for nonfood agricultural commodities, these policies have resulted in the extraction of economic surplus from agriculture for use in promoting growth in nonagricultural public and private sectors, with the simultaneous reduction of investment and production incentives in agriculture. Policies to extract economic surplus out of agriculture and policies to maintain low food prices to consumers are often closely linked. However, they need not be. In some countries, governments pursue consumer and producer subsidies simultaneously either for the same commodity—examples include rice in Sri Lanka (Gavan and Chandrasekera, 1979) and maize in Mexico (chapter 20)—or for different commodities—for example, taxing producers of basic staples and protecting producers of meat in Egypt (von Braun and de Haen, 1983). Some subsidy programs are financed solely by government revenues, such as the food stamp programs in Sri Lanka, Colombia, and the United States. Such programs would be expected to increase food demand, which, unless reflected in foreign trade adjustments, would tend to increase producer prices and thus have a favorable effect on producers.

In many cases, however, consumer food subsidies are financed partly or totally by producers. Losses to producers may be large, as illustrated by the price policy for rice in Egypt (chapter 12). In this example, low producer prices are enforced by a combination of forced procurement and export taxes. During the 1970s, the procurement price varied from 11 percent of international prices in 1974 to 50 percent in 1972 and 42 percent in 1980, thus reflecting a relatively constant and low procurement price in the face of price fluctuations in the international market (von Braun and de Haen, 1983). Large producer losses were also experienced by rice producers in Thailand because of high export taxes resulting in low domestic prices to producers and consumers (Trairatvorakul, 1984).

Distribution of Benefits between Urban and Rural Poor

As illustrated earlier, the design of consumer subsidy schemes has important implications for the distribution of costs between producers and governments, which in turn is an important determinant of the effect on income distribution. Moreover, commodity choice and other subsidy design considerations may influence the distribution of benefits and costs among farmers.

The effect of pricing policies on the rural poor depends upon the causes of rural poverty. Different groups of the poor may be affected differently, the most obvious distinction being whether or not they depend on

food production for their incomes. Furthermore, the immediate effect may be quite different from the effect in the intermediate and long run.

The effect of food price increases on those poor who derive their incomes from food production would be expected to be positive provided that the retail price increase is reflected in higher farmgate prices. Higher prices would add to revenues obtained from marketable surpluses, and labor demand in food production would be expected to increase. However, total demand for rural labor need not increase if the food price increases cause substitution of less labor-intensive for more labor-intensive commodities, for instance, the substitution of rice for jute in Bangladesh (R. Ahmed, 1981).

Findings from recent research indicate that food price increases may be much less favorable for the rural poor than might be expected. In some countries, many of the rural poor do not derive a large share of their incomes from either cultivation or wage labor in food production. Furthermore, a large proportion of cultivators are net purchasers of food. Mellor (1978) concludes that the poorest 20 percent of the rural population in India would lose from increasing foodgrain prices. Similar results have been reported by Binswanger and Quizon (chapter 22) and by de Janvry and Subbarao (1984). Sahn (1986) concludes that only 3 percent of the rural poor would be better off from an increase in the price of rice in the short run—that is, ignoring any long-term effects on wages and employment.

In Thailand, the rural poor would also not benefit greatly from rice price increases (Trairatvorakul, 1984). Even though many of them are rice producers, the marketable surplus is often small, and a large proportion are net buyers of rice. Such results, however, may be specific to the Asian context. The distribution of benefits from food price changes among rural Africans has not been studied in similar detail.

As mentioned, estimates of the long-run effect of food price changes on the poor—urban or rural—must include the effect on wages and labor demand, both direct employment in food production and stimulation through farm and nonfarm growth linkages.

When the long-run implications of reductions in food price subsidies are expected to benefit the poor, the poor may be compensated for short-run negative effects. The need for such compensation depends on the ability of a government to phase in the price rises in coordination with the growth in employment and incomes of the poor.

Targeted Food Price Subsidies

Because of the high fiscal costs of maintaining general food price subsidies, efforts have been and are currently being made to target food subsidies to groups of households expected to be particularly vulnerable to high

and increasing food prices. If the sole goal of food subsidies is to increase or sustain the purchasing power of the poor, targeting could greatly reduce the costs and still reach the goal, provided that targeting is politically and logistically feasible.

The cost effectiveness of explicit subsidies, in terms of the government's cost of improving the ability to acquire food among food-deficit households by a certain amount, is positively correlated with the degree of targeting up to a certain level. This is because targeting excludes some or all nondeficit households from sharing in the benefits from the subsidies. However, the administrative costs of operating a food price subsidy program increase as the degree of targeting increases. This is of particular concern in developing countries where both trained administrators and household income data are scarce (chapter 8). Thus there is a point beyond which increases in administrative costs exceed the cost savings from further reducing benefit leakages to nondeficit households. Furthermore, as a program becomes more narrowly targeted, the risk of omitting target households from the program increases. Targeting implies a restriction on eligibility or on participation. In addition, targeting may limit subsidies to particular periods of the year, for example, the lean months, in cases where seasonal fluctuations in food supplies or purchasing power are a major cause of malnutrition.

Eligibility may be based on a number of criteria, the most obvious being household income or a combination of household income, size, and composition. Although individual household incomes are used as criteria in certain programs, it is usually difficult to obtain an accurate estimate of these incomes. In Sri Lanka, initial targeting was based on self-reported incomes. Even if such initial targeting is possible, however, it is difficult to obtain information on changes in household incomes over time in order to make appropriate adjustments. Moreover, some households are in a better position to underreport incomes than others. For example, the Sri Lankan food stamp program excludes a large portion of the estate workers because their incomes are more easily documented than income in other sectors, although health and nutrition indicators show that many of these households are in need of food subsidies.

A second criterion that is used relates to the location of the outlets for subsidized foods (geographical targeting). The approach is to select neighborhoods with a high proportion of poor households and to place outlets for subsidized foods in those neighborhoods. This approach was the basis for the Philippine food price discount experiment (chapter 14; Garcia and Pinstrup-Andersen, 1987). In Bangladesh, however, the choice of neighborhoods had little relation to poverty (R. Ahmed, 1979). A third criterion may be that of selecting malnourished individuals at existing health clinics. This approach is used in a number of integrated health and nutrition

programs—for example, the rural health clinics in Costa Rica and the recently terminated food stamp program in Colombia. The latter is in fact a combination of geographic targeting and health clinics.

Target households may also be identified as those having malnourished children, as indicated by low weight for age. Such an approach is used in the food price discount experiment in the Philippines. Administratively, it may be easier to target programs to all households with nutritionally vulnerable individuals irrespective of nutritional status—for example, infants and pregnant and lactating women. However, such an approach would result in a larger number of households in the target group.

A certain degree of targeting may also occur where the customers desiring to purchase subsidized foods must wait in line a long time. Whether the long wait is intentional or merely a result of inefficient operation of the program, a higher opportunity cost of time may discourage participation by higher income groups. Of course, if the subsidy is sufficiently large higher income groups may hire persons to wait in line for them. Furthermore, if the quantity purchased per visit is not restricted, the higher income groups may be more willing to participate than the poor, as their larger purchases justify the waiting time. This was observed in Egypt (Alderman and von Braun, 1984).

Targeting can also be accomplished by offering foods of lower quality or foods generally not desired by higher income groups and that occupy a large budget share among the poor. The earlier-mentioned distribution of subsidized wheat flour perceived to be of low quality in ration shops in Pakistan is an example.

The implementation of targeted food price subsidy programs may be difficult. Correctly identifying target groups and assuring that subsidized food is in fact obtained by these groups may be a much greater and more costly task than envisaged prior to initiating the program. As a result, a large proportion of the subsidized food may actually go to nontargeted households, while administrative costs run high.

The flexibility of a targeted system can influence how it is perceived by the general public. Although income-related targeting may carry the stigma of recipients being labeled as poor, a system that is flexible enough that families with temporary fluctuations in their incomes may enter and drop out of a subsidy program could be considered more as a safety net. Thus the number of families that have the potential to use the program—say, during a spell of illness, unemployment, or off season—may exceed the average number of beneficiaries. Such a program may have broader political support. This is a major concern because, as illustrated by the termination of the Colombian food stamp program, diminishing the number of recipients through targeting runs the risk of narrowing the pro-

gram's base of support so much that the program, without influential backers, may be eliminated.

Lessons Learned

In summarizing lessons learned from studies of consumer food subsidies in several countries, only those specifically related to rationing and income transfers are discussed here.

The fiscal costs of subsidies, as well as the economic costs stemming from the price distortions that accompany subsidy programs, contribute to pressures to eliminate such programs. This poses a dilemma for planners who also recognize the contributions of subsidies to the economic well-being of the poor.

Consumer food subsidies have significantly increased the purchasing power of the poor in a number of countries and have reduced the risk of food shortages and price fluctuations for households. Attempts to eliminate existing subsidies could result in severe hardships and are likely to be met with strong resistance. And not only the poor would resist, because most food subsidy programs have also provided significant benefits to better-off consumers. Furthermore, the economic costs of food subsidies and other price distortions are not necessarily perceived by the general population.

The net effect of food price subsidies on incomes of wage earners is likely to be considerably less than the income transfer embodied in the subsidies, because wages tend to adjust to changing food prices; thus at least part of the transfer is passed on to other sectors of the economy. This implies that consumers (wage earners) would be better off with a change from food subsidies to a wage increase equal to the real income embodied in the subsidy. It also implies that government savings from reduced food subsidies would be partly offset by increasing public sector wages. This occurred in Sri Lanka (chapter 18) and would be likely to occur in Bangladesh and Egypt. In some countries, food subsidies may in fact be viewed as partial wages to public sector employees, including military personnel, and may be designed with this in mind.

The sizes of benefits and costs, the way they are distributed, and the extent to which rationing goals are met vary among programs and are influenced by program design and implementation. Modifications of existing programs may improve their performance. However, for such modifications to be successful, program goals must be clearly specified. Pursuing rationing goals efficiently may require programs that are different from those needed to assure efficient targeted income transfers. Many existing programs and policies have changed over time from being primarily public

distribution schemes aimed at assuring households access to certain rations of basic staples at fixed prices to much more costly food-linked income transfer programs. In some cases, it appears that the transition has been by default and has been caused by an inability to increase the prices of food rations at the same rate as prices increase in the open market.

Household targeting is a key element in efforts to achieve transfer goals at reduced costs. However, targeting conflicts with rationing goals if the latter are interpreted to include all households. But targeting is compatible with efforts to pursue rationing goals for the poor. Modifications in current general subsidy programs toward such targeting would be likely to reduce fiscal and economic costs, but they would also result in economic losses for nontarget households and therefore would incur political opposition.

Ideally, household targeting would be based on incomes of households adjusted for size and composition. However, reliable estimates of the income of each household are usually not available, and efforts to obtain and periodically update such estimates would be extremely expensive and often impossible. Nevertheless, income level and asset holdings may be used to exclude the highest income groups.

A large number of other targeting mechanisms have been tried, some with success and others not. These include geographical targeting, targeting by the nutritional status of household members or by employment status, choice of inferior commodities or commodity qualities for subsidization, and targeting in certain periods of the year where seasonal fluctuations severely limit the ability to acquire sufficient food. The most appropriate choice among the various targeting approaches depends on the particular circumstances within which subsidies are introduced (chapter 8). As a general rule, however, targeting approaches that contradict household behavior the least are most likely to be successful. Lack of success in targeting or high costs of targeting are frequently due to the desire and ability of nontarget households to circumvent targeting efforts that do not correspond with household preferences.

The cost effectiveness of food subsidy programs may also be improved by choosing the right program for particular circumstances. The most common types are price subsidies for specific rations or unlimited quantities and food stamps. The transfer effects of price subsidies for inframarginal rations would not be expected to differ greatly from food stamps for a given household. However, the degree to which rationing goals are achieved may vary greatly between the two program types. The critical issue is whether the household is assured a certain physical quantity at a fixed price or a certain monetary transfer. In the former, recipient households are assured a constant transfer in real terms, whereas in the latter, price fluctuations and increases in open-market prices may erode the real

purchasing power of the transfer, as illustrated by the food stamp program in Sri Lanka (chapter 18). In theory, the difference between the two program types could be eliminated if the ration price was increased as fast as the open-market price or if the nominal value of food stamps was increased at the same rate as the open-market price. However, inaction by the government results in increasing fiscal costs and in constant or increasing benefits to the recipients in the former but in decreasing benefits and fiscal costs in the latter.

The issue of appropriate adjustments in subsidized food prices and the effect on rationing and income transfers is particularly important during periods of devaluation of the local currency or rapid food price increases in the international market. Maintaining fixed nominal prices for food staples in the face of devaluation and rapidly increasing domestic prices may result in large and unsustainable increases in the cost of food subsidies. On the other hand, if sharp increases in domestic prices are fully reflected in the price of basic staples, the poor may experience severe hardships that would be economically and politically unsustainable. Social unrest caused at least in part by increasing food prices in a number of countries during the recent past illustrates this point.

Recent efforts to solve foreign debt and deficit-spending problems have included devaluation, higher agricultural prices, and reductions in spending on food subsidies and social programs in a number of countries. In some cases, it appears that the poor have borne a disproportionately large share of the burden of economic adjustment (Pinstrup-Andersen 1988c). Although these measures may be necessary to solve immediate economic problems and may result in accelerated long-term economic growth and employment, short-term implications for the poor may be such that compensatory measures are needed. Before such measures are designed, it is important to clarify which consumer groups the government wishes to compensate and whether such compensation will meet the stated goals.

Subsidies are, of course, only one means of keeping food prices low to the consumer. Improvements in the efficiency of food production through technological change, improved rural infrastructure, and expanded input use, as well as improved marketing efficiency, offer great opportunities for reduced consumer prices without adverse effects on producers. The improved capacity of the poor to generate sufficient incomes to meet these requirements and other demands provides the long-term means to meet welfare goals. Consumer food subsidies should be viewed as temporary but important means to assure that the poor are able to acquire sufficient food to meet nutritional requirements in the interim.

3 Food Consumption and Nutritional Effects of Consumer-Oriented Food Subsidies

SHUBH K. KUMAR AND
HAROLD ALDERMAN

An examination of the experience of the various countries operating food subsidies reveals great diversity in the objectives, instruments, and effects of these programs. However, three broad observations can be made that are relevant to the analysis of their nutritional consequences. First, although improved nutrition is seldom an explicit objective, promoting food security for those segments of the population perceived to be vulnerable is a rationale in the majority of the cases examined.[1] Second, this rationale is translated in many cases into a combination of interventions in agricultural pricing and procurement alongside a distribution mechanism that protects consumers of these commodities through subsidized prices. Third, although food security may be the overriding concern in the majority of consumer food subsidy programs, the choice of commodities often includes nonbasic food items, such as sugar, and nonfood items, such as kerosene, tea, salt, and soap, which have also been considered essential commodities and therefore were included in the subsidy.

Implicit in most subsidy programs is a reluctance to leave the distribution of commodities to the private sector alone. Whatever the justification for that position may be, securing availability at stable prices, if only for a portion of food and other essential commodities, may have an important stabilizing effect on consumption. Imported food, including food aid, has played a role in many of the subsidy programs examined. In many such instances, production incentives such as input subsidies and guaranteed producer prices were also instituted.

If nutritional improvement has not been among the major objectives of the food subsidy programs, why should it be used as a yardstick for

1. Two instances in which nutrition improvement was an explicit objective are the Colombian food stamp scheme and the Philippine food discount experiment. The Sri Lankan food stamp scheme may also have had this as an indirect objective, in that it was intended to blunt the adverse consumption consequences of the elimination of the ration shops.

success? Why should program characteristics be examined to determine whether they have contributed to an improvement of the nutrition situation? Perhaps at the root of this question is the widely held but erroneous perception that nutrition problems stem from a protein or micronutrient deficiency rather than from a lack of calories and basic foods. Consequently, although some of these subsidy programs have been in effect for decades, their possible nutritional contributions have not been recognized until recently. It has only recently been recognized that a program designed with goals other than nutritional ones may still have a significant effect on nutrition. According to the currently accepted general model of causality in nutrition, nutritional status is affected by the amounts and kinds of food available, the ability of households to obtain the available food, the desire of households to allocate resources for additional food, the intrafamily distribution of acquired food, and the physiological utilization of ingested food (Pinstrup-Andersen, 1985b).

Food subsidies can influence both food availability and the ability of households to obtain food and consequently have the potential for improving nutrition. In addition, the choice of commodities and ease of access by different population segments can also influence the desire to obtain additional food and its intrahousehold distribution. Since availability is influenced indirectly by production and marketed supply through prices, and ability to acquire food is influenced through incomes, the discussion in this chapter will be concerned primarily with the income and price effects on consumers that influence their ability to obtain additional food, and with design elements that influence targeting and hence the net consumption increment.

The size and distribution of the nutritional improvement is determined by the design of the program as well as by the underlying nature and distribution of the nutrition problem. In many instances—in Mexico, India, Bangladesh, and Zambia, for example—the most visible part of the problem, urban food supply, is more likely to be addressed by a subsidy program. Although it has not been possible to examine whether this distribution provides an additional direct impetus for rural to urban migration, there is occasional reference to its role in subsidizing growth in urban employment. Any judgment on whether or not these consequences are favorable will have to be made in context. In addition to a locational bias, explicit targeting within locations may be considered, using income or nutrition status criteria, choice of commodities, rationing, or other targeting approaches as discussed in chapters 2 and 8.

As a general statement, it may be said that, for a given amount of income transfer achieved, the maximum nutritional benefit may be expected for those with the largest nutritional deficit, which is generally the

lowest income group. Consequently, improvements in cost effectiveness can be expected from measures that explicitly or implicitly target the transfers to the most malnourished.

Effects Mediated through Income Changes

While income transfers of any form will influence the food consumption of the poor, for various political and administrative reasons, food-related income transfers are more common than cash transfers (chapter 2). Food stamps are a well-known example of food consumption programs that have their principal effect through enhancement of income. Such programs are generally expected to cause a larger increase in food expenditures per dollar transferred than cash income transfers when the recipient is required to purchase the stamps for a price up to the prestamp expenditure on food (Reutlinger and Selowsky, 1976). Such a requirement was originally included in the U.S. food stamp program, which is the oldest and most studied program of its type. However, the requirement was removed during the second decade of the program. This reform increased the participation of elderly and rural poor, whose limited or irregular incomes prevented them from meeting the monthly purchase requirement (Fersch, 1981). In so doing, however, the change also moved the program closer to becoming an income guarantee program (C. Davis, 1982). Although the U.S. program has been shown to increase food expenditure and nutrient intake, the general economic situation in the United States as well as differences in administrative and marketing infrastructure between it and developing nations preclude generalization from its example.

Two other countries—Sri Lanka and Colombia—have had food stamp programs, both of which have had an effect on food consumption. In the absence of a purchase requirement and with the value of stamps appreciably less than prestamp food expenditures, the Sri Lankan program has served primarily as an income transfer. The average increase in calorie intake attributed to this transfer came to 15 percent of total calories for the poorest decile in 1981. This percentage declined to 5 percent of the calories consumed by the fifth income decile (chapter 18).

In many respects, the Colombian food stamp program was designed to explicitly focus on nutritional goals. The program included elements of nutrition education and surveillance. It recruited families with children under five years and pregnant and lactating women. It was unusual in that the stamps did not pay the full value of the food, but it differed from a subsidized ration in that the family could choose to allocate its stamps to any of the included foods. On average, the package of services caused the recipients to increase their calorie consumption by 15 percent. However, because of the low value of the stamps, very little of that increase—less

than 1 percent of requirements—can be attributed to the income embodied in the stamps. As the stamps were primarily for the purchase of food with high protein content, including enriched products, the effect on protein consumption attributable to the stamps was estimated at three grams per person per day (Pinstrup-Andersen 1984).

Increases in income are the primary reason for the nutrition effects of many ration schemes. Most commonly, ration programs offer quotas of certain commodities at subsidized prices, while additional amounts of the commodities are also available in the open market at higher prices. If resale of rations is possible or if the ration quota is less than the amount the family would buy at open-market prices, the ration serves as an income transfer. This is true of the Egyptian ration scheme and for most of the recipients of grain rations in Pakistan, India, and Bangladesh. The subsidy program in Pakistan led to an average increase of 114 calories and 3.8 grams of protein daily for the urban poor. The rural poor, on the other hand, increased their average net calorie intake by only 16.1 calories and their protein consumption by 0.6 grams (chapter 17). However, as only a quarter of the rural population received wheat rations, the effect per rural *recipient* was much greater. Although this calorie increment was still less than in urban areas, rations provided 27 percent of grain consumption in rural regions where it was available (Rogers, 1981).

Although no direct measurements are available for assessing the contribution of the ration system to nutritional status in Bangladesh, the program contributed appreciably to grain consumption. The average increase in daily calorie consumption attributable to the income effect of the ration was more than 250 calories per person per day for urban consumers with incomes less than Tk 100 per month in 1974, and 200 calories a day per person for households with per capita income ranging between Tk 100 and 200 (chapter 15). Estimates from two states in India indicate increases in calorie consumption from the fair-price shops of similar magnitudes (chapter 16). For the poorest Indian consumers, the income effects of the ration system increased their calorie consumption up to 18 percent above their estimated intake without the system. The effect of the ration system, however, varied greatly between states in the volume of foodgrain distributed, ranging from six kilograms per capita annually in Rajasthan to forty-seven kilograms in Kerala in 1981. A separate study in one of these states, Kerala, indicates that the nutritional status of children as measured by weight for age was positively associated with the rationed rice subsidy. For the poorest 50 to 60 percent of the households, ration rice contributed 60 percent of rice calories and 22 percent of total dietary calories. It was estimated that elimination of the ration would reduce household calorie consumption by 7 to 14 percent and child nutritional status, as measured by weight for age, by 8 percent. Factors such as dietary protein and diet diver-

sity, which reflect the quality of food consumption, were also positively influenced by access to the ration subsidy (Kumar, 1979). Similarly, preliminary results from a pilot project in the Philippines show that the income transfer from the ration contributed more than 8 percent of total calories, or 140 calories per day (chapter 14). The discontinued ration system in Sri Lanka increased calorie consumption by 63 calories per capita per day on average, and by 115 calories, or over 10 percent, among the poorest decile (Gavan and Chandrasekera, 1979).

Food-for-work (FFW) programs also contribute to food consumption via an increase in family income. Such programs, however, are generally short term. The largest, the Bangladesh program, provides more than 100 million person-days of employment annually (Bangladesh, 1981). This employment-augmenting scheme increased seasonal income of participating households as much as 50 percent, although the increase in annual earnings was about 10 percent (BIDS IFPRI, 1983). The short duration of such a program may mitigate against observing nutritional effects. Because FFW programs distribute relatively large volumes of grain, they may have a significant effect on local prices in areas in which market infrastructure is underdeveloped. In such cases, the program may have an additional effect on food consumption, as lower local prices tend to increase the grain consumption of all landless and small farmers in the area, irrespective of their participation in the program. Whereas low grain prices may work to the detriment of grain producers, a seasonal FFW program is more likely to affect the interseasonal price variation than long-term price expectations. The latter have the greater influence on production and supply response.

In addition to the short-run direct employment and income effects, substantial long-term benefits can accrue from well-designed, well-constructed, and properly maintained structures in FFW programs. Infrastructure made possible with such projects (irrigation canals, flood protection embankments, and roads) has been shown to contribute to growth in agricultural productivity as well as in nonagricultural activities in rural areas in Bangladesh. The importance of nonagricultural employment growth for improving the incomes and food entitlements of poor households and of the significant role of various rural infrastructure in this process should be stressed (BIDS IFPRI, 1985).

Price Effects

Consumer price response may lead to changes in nutrient intake distinct from the income effects discussed above. When the quantity of a subsidized commodity that a household may obtain is not restricted, the household tends to consume more of that good than it would if the price

was higher and its income was the same. This effect is the result of the combined income and substitution effects of the price change. The income effect is determined by the budget share devoted to the commodity and the income elasticity of consumption. The substitution effect results from changes in relative prices of different food items that in turn lead to shifts in the diet composition (Mellor, 1978). In addition to these, if food price changes also lead to employment and production effects, there would be a further effect on the levels and distribution of food consumption. In the short run, the maximum consumption effect of a price subsidy results when the budget share is large and substitution for other foods does not offset the increase in the consumption of the subsidized food. Thus Thailand's export tax on rice increased domestic rice consumption by reducing the domestic price in much the same way as an untargeted explicit price subsidy. Thailand's rural and urban poor were quite price responsive, increasing their total calorie intake 5 percent for each 10 percent decrease in rice prices (Trairatvorakul, 1984).

In some countries the net effect on calorie consumption from a price reduction in a staple good, however, may not be this large. Consumers may reduce consumption of nonsubsidized foods as they increase consumption of the subsidized ones. Thus subsidies on wheat bread in Brazil slightly *reduced* the calorie consumption of the poor because the increased bread consumption was offset by decreases in rice and other foods. However, subsidies on rice, and to a lesser degree on milk, would increase total calorie consumption as increases of rice are further augmented by increases of oil and sugar consumption (Williamson-Gray, 1982).

Targeting Consumption to Those Nutritionally at Risk

Whereas increases in food consumption are usually indicators of consumer welfare, the effects of such increases are dependent on a number of factors. In general, the increase in calorie intake is greater when the initial intake is low, although in such cases poor health and the prevalence of infectious disease may reduce the effect. There are, however, few studies of subsidy programs that measure nutrition effects. As reported earlier, growth standards indicate positive effects from subsidies in Kerala. In Sri Lanka, the relatively low infant mortality observed in the 1970s has been attributed to the presence of a widespread subsidy scheme (Isenman, 1980). Since that time, consumption by the poor has declined concurrently with policy changes, including a reduction in subsidies and the eventual change to food stamps (chapter 18; Sahn, 1986). Causality has not been proven, however, as many economic changes have occurred in recent years. Furthermore, there are no current data to relate the recent consumption changes to mortality. The Sri Lankan system is income targeted.

The estate sector (workers in tea and other plantation crops), which had the highest reported malnutrition and infant mortality, received a relatively small percentage of food stamps because incomes in this sector are more easily verified than in other sectors. The estate sector had earlier received relatively large per capita quantities of the now discontinued wheat flour subsidy, prior to the onset of income targeting in the late 1970s (chapter 18).

Although targeting by income in Sri Lanka has some disadvantages in that it excludes some families that are nutritionally at risk, this is a property of targeting in general and not just targeting by income (chapter 8). Even targeting criteria explicitly designed to focus on nutrition run this risk. One of the few subsidy programs designed with nutrition as a primary goal—the Philippine ration project—used geographical targeting, having chosen villages with high percentages of undernourished children. Within the village, however, well-nourished children are not excluded nor are malnourished children from neighboring villages currently included. The Colombian food stamp program was targeted by region and, within the location, to families with members belonging to groups potentially at risk of malnutrition—preschoolers and pregnant and lactating women. Recipients were to be eligible for one year, again stressing the nutritional rather than the income distributional goal of the system.

Inclusion of children not currently malnourished in a targeted scheme may serve a preventive role. The goal of targeting may be not only to reach the currently malnourished but also those with a high probability of being malnourished in the absence of specific interventions.

In weakly targeted schemes, such as those in India, Pakistan, and Bangladesh, increased food consumption may still have a large nutritional effect. Much of the increased consumption goes to families nutritionally at risk. The poor in South Asia have low levels of calorie consumption. Consumption increases of the range observed undoubtedly reduce or close the gap between intake and requirements, however defined, for millions of households in the region. At the same time, however, there are a number of families for which the increases in calorie intake are unlikely to have measurable nutrition effects, since presubsidy intakes were already adequate. Furthermore, for these relatively well-off groups, the income effects of subsidies lead largely to increased purchases of nonfood items. This is in accord with consumer preferences but are "leakages" in terms of nutritional goals. For example, urban households in Bangladesh with incomes of more than Tk 1,000 per month in 1974 received rations only 15 percent less in per capita terms than that received by individuals with incomes between Tk 100 and Tk 200, but their net increment in food consumption was negligible (R. Ahmed, 1979).

Egypt offers an example where further increases in calorie consump-

tion by families are not likely to provide an improvement in nutritional well-being. The transferred income is more than 15 percent of the income of the poorest quartile and adds about 5 percent to calorie intakes. In addition, the low price of unrationed bread, flour, and grain contributes to the relatively high food consumption. The poorest urban and rural quartiles consume, on average, more than 2,300 calories daily. At the same time, however, one notes that the rest of the population consumes 3,500 calories per capita on average (Alderman and von Braun, 1984). There is unlikely to be much nutritional benefit from increasing the food intake of the general population to these levels. However, the removal of the subsidies could be nutritionally harmful.

Subsidy programs with explicit nutritional objectives may include nutritional surveillance and use the weight of a child or a child's growth as the criteria for targeting. These programs may be part of maternal and child health schemes and may offer an alternative to more broad-based subsidy programs (chapter 9). Even when a program does not use growth for screening recipients, weighing programs as well as nutritional education components may be used to enhance the nutritional effect of the subsidy. This was observed in Colombia and the Philippines.

Choice of Commodity

The choice of commodity or commodities in the subsidy program can be a factor in the nature and distribution of nutritional benefits, especially when explicit targeting within a population cannot be used. Nutritionally desirable commodities from the standpoint of dietary composition have sometimes been selected, as in the Colombian food coupon scheme and the Philippine pilot food discount experiment. In most instances, however, several commodities are included, both basic staples and items with high income elasticities. Although basic staples, especially those perceived to be of inferior quality, may provide a basis for self-targeting the subsidized commodity to the vulnerable groups,[2] the absolute income transfer from even small purchases of "superior" commodities has often been larger for even these groups. This was shown clearly in the ration program in Pakistan for sugar, which was relatively equitably distributed among the low- and high-income groups in terms of percentage of income transfer.

Self-targeting via choice of commodity has often been cited as a way of obtaining favorable distributional consequences from food subsidies. Accordingly, if a subsidy was applied to an inferior commodity— that is, one

2. This was documented in Pakistan for wheat flour and to a lesser extent in India for the wheat flour and rice sold through the ration shops and for rationed rice and sorghum in parts of Bangladesh. However, maize tortillas subsidized in Mexico help to target the income transfer to the urban but not the rural poor.

where consumption declined with rising incomes—the income transfer would be greater both in absolute and relative terms for the lowest income groups. Since the marginal propensity to allocate income to food consumption is the highest for these groups, the net nutritional effect of the subsidy would be maximized. However, in practice such pure inferior commodities are relatively scarce. In many cases, consumption of staples either stabilizes or continues to increase with income. Since income elasticity for the population and price of the food items tend to be correlated, there is likely to be an inherent contradiction in the objectives of self-targeting and maximizing income transfer with a unit of any given commodity.

It may be useful to draw a distinction between the possible effects on consumption of preferred commodities rarely consumed by the poor—milk, oil, and meat, for example—and staples with high-income elasticities, such as wheat in many countries. Whereas a subsidy on a commodity that is already consumed in the diet serves as an income transfer and increases consumption of all items, a subsidy on a rarely consumed commodity or on a superior commodity in excess of the quantity consumed affects the marginal price and may cause shifts away from the other commodities present in the diet that may have provided lower priced nutrients. Thus as mentioned earlier, a price subsidy for wheat in Brazil would actually reduce calorie consumption due to shifts away from the other less expensive cereals (Williamson-Gray, 1982). However, it should be noted that there are no quantity restrictions; the entire wheat supply is subsidized. In the same context, a milk subsidy was expected to have a positive nutritional effect but was believed to be an expensive way to address malnutrition, "because the greatest benefits can be expected to go to higher income individuals" (Williamson-Gray, 1982). Comparing wheat bread, milk, and rice, this study found that rice, especially lower quality rice, which has a declining income elasticity, would have the maximum consumption effect per unit of fiscal cost.

The Colombian food stamp program was unusual in that the subsidized commodities were new items—nutritious processed foods, including infant formula. Despite an explicit subsidy, consumers had to pay part of the cost of these items, implying reduction in expenditures on other items. Thus the effect on consumption or nutrition clearly depends on the kinds of substitutions made in the household commodity basket as a result of purchases of the new subsidized foods. However, since 1982 the list of foods that can be purchased with food stamps were expanded to include grain and vegetable products as well as enriched cookies. Since most were processed foods, their nutrient costs are likely to be higher than existing products in the diets. It should also be noted that food stamps were only one element of the total program, which also included nutrition education,

home garden production, and primary health care. Despite all this, it was found that the household's dietary nutrient increment from food stamp income was the same as would be obtained from a simple cash income transfer. The ultimate effect on individuals depends, however, on intrafamily distribution. In Mexico, for example, milk was targeted to children. The program increased the percentage of calories coming from milk for the children, but total calorie consumption by the children increased less than household consumption (Kennedy, 1983). In Kerala, though children's food intake was not recorded, their nutritional status was significantly better when subsidized rice, a basic staple, was available (Kumar, 1979).

If the increase in consumption is due only to release of income because the household spends less on the existing food basket, then the commodity itself only serves as a mechanism to transfer the income. In such cases, the choice of commodity should be based on the income transfer in the local price environment rather than on the nutritional value of the commodity. According to economic theory, only when the quantity of the subsidized commodity available exceeds the quantity consumed in the absence of the subsidy would it additionally influence allocation behavior through changes in the relative marginal prices. In such cases, the consumption of the subsidized commodity is likely to increase over and above what might be expected through an income increase alone. It should be noted, however, that the nutritional effect depends on changes in consumption not only of the subsidized item but of other commodities as well.

In some programs a subsidized commodity is made available in unrestricted amounts or with quotas above levels of previous consumption in order to increase the consumption of an item believed to contribute to the nutritional quality of the diet. Thus oil is included in the Philippine pilot study because its inclusion in a child's diet is expected to increase the calorie density and release the constraint that excessive bulk may play in increasing calorie intake. Such an effect will be enhanced if families target such foods to children or are encouraged to do so as part of the program. Sometimes, the nutritional rationale may be based on incorrect or inadequate information. Thus poultry and meat are subsidized in Egypt, in part to increase the animal protein content of the diet. Not only does the majority of the subsidy accrue to the middle class, as with the example of subsidized milk above, but there is no clear evidence of a need for this additional protein—animal or otherwise—among the poorest or any other population groups in Egypt.

Commodity choice may also affect household labor allocation. For example, subsidies on bread such as those available in Egypt and Sudan may encourage families to shift away from home baking. This may free time for child care, although there is currently little data on the effects of subsidies

on the time allocation of families.[3] In Mexico, rural families were not able to take advantage of the time savings from prepared tortillas, as they were seldom available outside of the cities (chapter 20). Time allocated for child care may also be influenced by the time required to go to distant distribution centers or for queueing.

Choice of In-Kind versus Cash Transfers

Neoclassical economists tend to oppose food subsidies because they see them as distorting prices necessary for efficient resource allocation and also because the subsidies detract from economic activity in the open market, especially if the government is directly engaged in the distribution of subsidized commodities. From this perspective, if income transfers must be made, it would be most appropriate to engage in cash transfers rather than in-kind transfers of food or other commodities.

Support of in-kind transfers derive from their greater political acceptance and relatively lower misappropriation risks vis-à-vis cash. In addition, for the private market to move commodities over long distances from surplus to deficit areas may not be a profitable undertaking and hence may not occur. Moreover, scarcities may be unduly exploited if a few large traders corner the local market. The major argument in favor of in-kind transfers may be that the supply needed to fulfill the incremental demand of the commodity in question is provided by the transfer.

According to the currently accepted interpretation of economic theory, in-kind transfers should have a consumption effect equal to that of an equivalent cash transfer. If the quantities of a commodity received as an in-kind transfer are greater than the amount consumed prior to the transfer, then price effects are operating in addition to the income effect, and the incremental quantity consumed is greater than with an equivalent income transfer. The net calorie intake may, however, be lower if the price effect is for a relatively expensive item in the diet. In most subsidy programs, except those with a generalized price subsidy such as rice in Thailand, maize in Zambia, and wheat in Egypt, the quantities available are inframarginal (less than the quantity consumed in the absence of subsidies) even for the poor.

However, empirical evidence is not fully supportive of the above interpretation of economic theory. Several studies that have examined the question of comparative consumption effects of food-related transfers and cash income transfer have found that the former have a greater effect on con-

3. When subsidized goods are in scarce supply, lines may form to gain access to the goods. This affects families' time. This is not an issue of choice of commodity, however, but of program implementation.

sumption than the latter, even when the former are inframarginal. Empirical evidence in favor of this difference in the income effect has been obtained in Sri Lanka, Kerala, and the U.S. food stamp program (Gavan and Chandrasekera, 1979; Kumar, 1979; Senauer and Young, 1984).

Similarly, evaluation of the complementary feeding program in Chile--an untargeted supplementary feeding program utilizing clinics and other distribution centers—indicates that the program results in a significant increase of both protein and calories in addition to the income effect (Herbert and Scandizzo, 1982). In Egypt it was found that consumers decreased their open-market purchases less than they increased their purchases of rations. The net increase in consumption exceeded the income effect (Alderman and von Braun, 1984). Exceptions to this result were found in the Sri Lankan (Edirisinghe, 1987) and the Colombian food stamp schemes. A recent study conducted in Panama also found that the consumption by households as shown by expenditure on foods was affected equally by food gift income as it would be from cash income. In this case, the commodity composition primarily consisted of donated CARE-Title II items, such as dried skim milk, corn-soy-milk, rolled oats, and oil. The analysis valued the donated foods at their retail price irrespective of whether they were kept for consumption or sold for cash (Franklin, Harrell, and Demousis, 1984).

In the face of the accumulating empirical evidence that in-kind or food-related income, in this instance food subsidy income, has a larger effect on consumption than cash income, several possible explanations have been advanced. First, when low-income households perceive subsidy income as a more stable or "permanent" income source than cash income, in accordance with the permanent income hypothesis, they would allocate more of it to food and basic essentials (Kumar, 1979); second, if subsidy income is controlled by a household member who has a greater marginal utility for food expenditures than the wage earner, then the effect could be the same (Rogers, 1983); third, the household budgeting process may preclude the fine adjustments required to fully adjust subsidy transfers into the expenditure pattern as though they were cash transfers; and fourth, in some cases, such as in food stamp programs, a gratitude or responsibility effect may also be taking place (Senauer and Young, 1984).

Overview and Conclusions

As the nutritional implications of food subsidy programs have become more evident, many new programs or modifications of earlier programs have attempted to incorporate nutritional concerns while keeping costs down.

Evidence from studies undertaken to date points to the conclusion that consumer food subsidies can increase food consumption in the short term, in some cases more than could be expected from an equivalent cash transfer. Not surprisingly, the consumption improvement from an equivalent amount of subsidy transfer was found to be greater for low-income households, which have relatively greater food deficits. Many of the programs have a significant consumption effect because their scale of operation is large. Although they incur large costs, the potential nutritional consequences of a rapid dismantling of such subsidy systems could be widespread and serious.

There is wide interest in scaling back such programs while retaining the benefits for the poor. Some of the mechanisms that appear to improve the cost effectiveness for raising consumption adequacy are self-targeting by choosing inferior commodities for subsidies, restricting quantities of subsidized commodities, and targeting groups using geographical or household criteria.

In the long run, the nutritional consequences of food subsidies will be determined by the overall production, employment, and income distribution consequences of these policies (chapters 2 and 4). In many instances, however, subsidies are being given to consumers and to producers for the same commodity at the same time. Examples are maize in Mexico and Zambia, rice in Sri Lanka and Bangladesh, and wheat in Pakistan and India. Producer subsidies have benefited mainly surplus producers. Because most of the consumer subsidies were located in urban areas, one must conclude that it was the rural poor—at least in the short run—who received the smallest income increment as a result of these policies. It is likely that a shift in priorities to include the rural landless and small farmer households as has been done in Egypt, Sri Lanka, and parts of India would be cost effective only if extended selectively to those areas where inadequate consumption is prevalent, because rural programs are more costly to administer than urban ones.

4 Macroeconomic and Trade Implications of Consumer-Oriented Food Subsidies

GRANT M. SCOBIE

The following passage is a translation from Spanish of an announcement by the Ministry of Economy and Trade published in the daily paper *La Nacion* in San Jose, Costa Rica, 13 July 1984.

Increase in the Price of Some Items in the Market Basket Was Modest and Aimed at Stimulating Production and Assuring Their Supply for the Costa Rican Consumer.

Application for Increased Prices for Some Basic Items

Upon receipt of an application from the producers of tortillas, milled coffee, vegetable lard, and liquid milk, the Ministry of Economy and Trade undertook an exhaustive study of the costs of production of these products, *whose prices had not changed for more than a year. On the basis of the results of the study it was determined that these activities were suffering losses as follows:*

	Losses[a]	
Product	Absolute (colones)	Relative (percent)
Coffee (kg)	0.85	2.0
Milk (liter)	1.22	9.0
Lard (kg)	0.40	1.6

[a]Refers only to the total costs without allowing for a profit margin nor wholesaling and retailing margins.

Need to Adjust Price or Subsidize Production

In view of the results presented above there were only two alternatives: (a) raise the prices; or (b) subsidize these activities.

The government is not in a position to subsidize further activities. *Such subsidies would have to be met by the consumer through* increased taxes *or through* higher rates of inflation *caused by the increased money supply*

needed to cover the fiscal costs. As a result, it was decided to allow small price rises, taking into account the consumer's interests.

These Industries Cannot Be Forced to Produce at a Loss

The government cannot require the firms to operate at a loss; in fact, existing laws require that a reasonable profit margin be guaranteed.

In the absence of a price increase sufficient to provide a reasonable profit margin, domestic production would cease, requiring us to import at even higher prices and expending foreign exchange. *For example, if the country did not produce crude palm oil, imported lard would cost the consumer ¢72.35/kg instead of ¢32/kg. The price increase will* encourage the planting *of African palm, as the producer will receive a fair price. This will help* develop the palm industry *in Sixaola among plantations owned by individual producers and bring* social benefits to workers *in the region. The rise in the price of milk will benefit more than 7,000 producers and ensure that the country is* self-sufficient *in this important* element of the national diet.

Price Increases Were Less than the Amount Applied for by the Producers

The new prices set by the government are much less than those sought by the producers:

Product	New Price (colones)	Price Sought (colones)	Extra Sought	
			Absolute (colones)	Relative (percent)
Coffee (kg)	53.00	70.70	17.70	33
Milk (liter)	16.00	18.88	2.88	18
Lard (kg)	32.00	36.15	4.15	26

Price Increases Imply Only a 0.5% Rise in the Consumer Price Index, Less than the Recent Salary Increase

The price rises in these products imply an increase in average monthly family expenditures of ¢63.18, and will raise the consumer price index by only 0.5 percent.

Product	Expenditure[a] (colones)	Price Rise (percent)	New Cost (colones)	Increased Cost (colones)
Coffee	140.52	10.41	166.19	15.67
Milk	619.86	5.61	654.63	34.77
Lard	102.19	12.47	114.93	12.74
Total				63.18

[a]Average expenditure per family per month, May 1984.

Prices of These Products are Still Lower in Costa Rica than in the Rest of Central America

Despite these rises in the prices of these products, they are still cheaper in our country than in the rest of Central America:

	Colones			
Product	Costa Rica (new price)	Guatemala	El Salvador	Honduras
Coffee	53.00	128.11	184.09	99.64
Milk	16.00	23.13	35.79	19.64
Lard	32.00	66.40	49.35	60.85

Ensuring the Supply of Products in the Basic Market Basket

The Ministry of Economy and Trade considered it necessary to advise the country, especially consumers, of the reasons for the price increases, not because the government wanted to see the public reaction, but because the increases were needed to ensure an adequate supply *by maintaining the firms economic viability. For these reasons, as much as one may wish to,* it is not possible to freeze the prices of basic goods. *Such a decision would simply lead to problems of inadequate supply, as* suffered by countries who have tried to adopt such a strategy.

The government is making a major effort to control inflation *and has succeeded in reducing the annual inflation rate from 81.7 percent in 1982 to 10.7 percent in 1983 and 6.11 percent for the period January to May 1984. These results have been due to a range of economic policy measures that have led to benefits for consumers.*

Ministry of Economy and Trade
San Jose, 11 July 1984

The foregoing excerpt is a clear and concise statement of the dilemma facing those responsible for setting food policy. It highlights many of the principal concerns of the policymaker, especially those related to the macroeconomic and foreign trade consequences of food policies. For this reason, it forms a useful focal point around which to organize a review of these issues. Table 4.1 provides both a synthesis of the issues and a guide to the structure of this chapter.

Economic Setting

Although the announcement by the Costa Rican government cited earlier is concerned with the direct effect of price controls on the margins of producers, the effect of economic policies on the internal cost structure in general lies at the heart of the issue. Traditionally, food and agricultural

TABLE 4.1 A summary of issues raised by the Ministry of Economy and Trade, Costa Rica

Points Expressed by the Ministry of Trade and Economy	Policy Issues for Food Subsidies[a]
Production costs are a basis for pricing.	Economic setting
The government has limited options.	Alternative strategies
Government cannot meet cost of higher subsidies.	Fiscal costs of subsidies
Higher subsidies mean higher taxes or inflation.	Taxation and inflation
Inadequate domestic supplies mean more imports and a drain on foreign exchange.	Foreign trade and exchange
Social benefits from extra production follow for farm workers, regional development, and nutrition.	Real incomes and income distribution
Rise in consumer price index will be less than 0.5 percent, and less than the wage increase.	Food prices and real wages
Food prices are lower than in neighboring countries.	International prices

[a]Items correspond to sections of this chapter.

policies have been conceived and implemented largely within the confines of the agricultural sector. Although that sector was certainly seen by development strategists as a source of capital, of labor, of cheap food, of export earnings—all of which were necessary ingredients for the growth of the industrial sector—specific policies on agricultural production and consumption were seldom cast in the broad setting of the economy as a whole. Therefore, food policy analysts can hardly be castigated for their scant attention to the macroeconomic setting.

In the first place, the macroeconomic linkages with the food sector were generally not well articulated; even if understood, estimates of the actual size and importance of the connecting links were few and sketchy or were conflicting. Furthermore, the analysts were surely fully occupied with identifying the issues, setting targets, and selecting appropriate instruments—be it for producer support prices, credit policies, irrigation schemes, storage, processing and transport, or ration prices.

Several factors have forced agricultural and food policy analysts to widen their field of vision.[1] In the first place, a revised view of the importance of food and agriculture to overall economic growth was emerging

1. For a discussion of the evolution of food policy, see Timmer, 1984, and Timmer, Falcon, and Pearson, 1983. Schuh (1968, 1974, 1976) has played an important role in placing the economics of food and agriculture in a broader setting.

(Mellor and Johnston, 1984). Related to this was the recognition that, although the biological constraints to expanding food production were being reduced by investment in agricultural research, the growth of agriculture was being "thwarted by the distortion of agricultural incentives" (Schultz, 1978). If the long-run potential of the sector was to be realized, these distortions would have to be removed. This included the raising of producer prices.

At the same time, the 1970s saw sharply increasing food prices, droughts, the specter of permanent energy shortages, and the omnipresent pressure of population growth. All these contributed to a sense of urgency that, to alleviate the manifestations of poverty, economic and social policy should address the provision of basic needs (Hicks, 1979; Streeten, 1979; Streeten and Burki, 1978; Streeten et al., 1982; Wheeler, 1980; and Boutros-Ghali and Taylor, 1980). As food consumption was clearly a major component in any basic needs strategy, the price of basic foodstuffs to consumers assumed heightened importance.

All these factors have led to the need to place food and agricultural policy within the broad context of economic policy as a whole. Not only have food policies had significant effects on such macroeconomic variables as government budgets, inflation, real wages, household income and expenditure patterns, imports and exports, foreign exchange, and income distribution, but those same variables have themselves molded food and agricultural policy and have determined much of the course of events within the agricultural sector.

In examining the effects of a rise in farmgate prices, not just the microeconomic question of the response of output or marketed surplus should be considered but also the effect of higher farm incomes on the rest of the economy. Likewise, the effects of a consumer subsidy must encompass the microeconomic response of changes in demand and, in addition, must trace the effect of lower food prices on the demand for other goods, on output from the nonfarm sector, on employment, on wages, and on government deficits (Taylor, 1980).

These are ambitious questions—highly relevant, but often beyond the capacity of existing models and data to generate consistent and useful responses. That progress should be uneven and the answers sometimes inconsistent is therefore hardly surprising. Recognition of the importance of the macroeconomic linkages has been a necessary first step; richer models and refined estimates have started to follow, and their results are drawn on extensively in this review.[2]

It is evident that consumer subsidies have macroeconomic consequences and that they simultaneously reflect macroeconomic circum-

2. A useful diagrammatic representation of the macroeconomic linkages of food policies is given in Timmer, Falcon, and Pearson, 1983.

stances. Yet perhaps of even more fundamental importance is the fact that their very origins often lie in the broader setting of economic policy and development. In summary, the macroeconomic setting is important for understanding not only the evolution and effects of consumer food subsidies but also their origins.

A commonly expressed view is that most of today's food subsidy schemes are simply legacies of rationing programs introduced during World War II. Aside from ignoring the fact that publicly subsidized food distribution has a history of at least seven thousand years, this view does not explain why many other wartime measures were subsequently dropped nor why expenditures on subsidies grew so rapidly in the 1970s.

It is sometimes suggested that food subsidies are an instrument of social policy aimed at reducing the incidence of malnutrition. But on theoretical grounds, their effect is likely to be limited, and certainly aside from disaster relief there can be few examples of any sustained improvement in nutritional status stemming from consumer subsidies. Even in households with identified cases of malnourished children, the free delivery of food has not served to eliminate the problem. Further, in almost every food subsidy scheme, access to subsidized food is not restricted to the malnourished or to those at nutritional risk, nor do the schemes cease once the nutritional status improves.[3]

Alternatively, food subsidies are sometimes viewed as a politically and administratively feasible mechanism for redistributing income. The increased political power of lower income classes disaffected by existing social structures has certainly influenced the evolution of subsidy programs in a number of settings.[4]

The notion that developing countries are dualistic provides another view for the origin and persistence of food subsidies (Lewis, 1954; Seers, 1962). These structuralist models take short-run supply as determined by the existing capital stock of the sector (Cardoso, 1981; Taylor, 1979, 1981, 1982, 1983; Chichilnisky and Taylor, 1980). They contend that, when combined with an inelastic demand for food, agricultural prices tend to fluctuate markedly. In contrast, nonfarm prices are set by a markup over prime costs (labor and raw materials), and output and employment in the farm sector adjust to clear the commodity markets. Excess industrial capacity is assumed to be a permanent characteristic of the nonfarm sector.

Any actions that accelerate the growth of the nonfarm sector lead to excess demand for food, which through higher wages leads to increased

3. New Zealand, until recently, subsidized fluid milk consumption.

4. The increasing importance of transfer programs in the government budgets of both low-income and industrialized countries is a central feature explained by the theoretical framework developed by Peltzman (1980). For a discussion of the Egyptian case, see Choueri and Eckaus, 1979.

labor costs. These lead to markups in nonfarm prices, so that rising food and nonfarm prices become an inevitable and predictable feature of economic development.[5] As a consequence, food subsidies are seen as a way to offset the inevitable effect of rising farm prices on wages and to avoid stifling the growth of the industrial sector, thought to be vital for economic development. Although these structuralist models have a number of restrictive features, their conclusion that the policies adopted to stimulate economic development inevitably lead to food subsidies is one that also follows from a more neoclassical view of development.[6]

Food consumption is governed by two dominant economic variables: incomes and prices. To understand the origin and effect of policies requires that their effects on incomes and prices be traced. Three broad classes of policies can be identified: strategies for long-run economic development (A); specific instruments of agricultural and food policy (B) relating to either producers (Bp) or consumers (Bc); and stabilization policies (C) implemented to correct short-run internal (INT) or external (EXT) disequilibria.

An example of how these policies contribute to, say, the determination of the price paid to producers is illustrated in figure 4.1. The world price for the product is assumed to be U.S. $10 per kilogram at the farmgate, which at an equilibrium free-trade exchange rate of P8 per dollar would yield producers P80 per kilogram. However, the long-run industrial protection strategies (A) imply an overvalued currency[7] and tax the producers P30 per kilogram (the difference between the free-trade exchange rate of P8 per dollar and the official exchange rate of P5 per dollar). The price of P50 is reduced to P30 by an explicit export tax (Bp) or P20 per kilogram. The effective price is further reduced to P20 by imposition of costs equivalent to P10 per kilogram due to short-run stabilization policies (C) introduced to achieve internal or external balance. An additional export tax, the lowering of the real support price, reductions in marketing services by state buying agencies, and reduced access to credit are common examples. Finally, the effective price is augmented to reach P30 per kilogram by offsetting subsidies on inputs such as fertilizer, irrigation water, and credit equivalent to, say, P10 per kilogram.

An example of the importance of some of these policies for the return to Tanzanian coffee producers is shown in figure 4.2, where, despite a dou-

5. The money supply is assumed to grow at a rate to accommodate the rise in nominal income.

6. Such a view does not impose the extremely rigid features of the structuralist models but allows for more price responsiveness in demand and supply and for high elasticities of substitution between inputs in production.

7. For a discussion of this issue, see Valdés and Siamwalla, 1988. The methodology for analyzing the incidence of import tariffs was developed by Sjaastad (1980) and Garcia (1981).

FIGURE 4.1 Effect of government policies on effective price received by producers

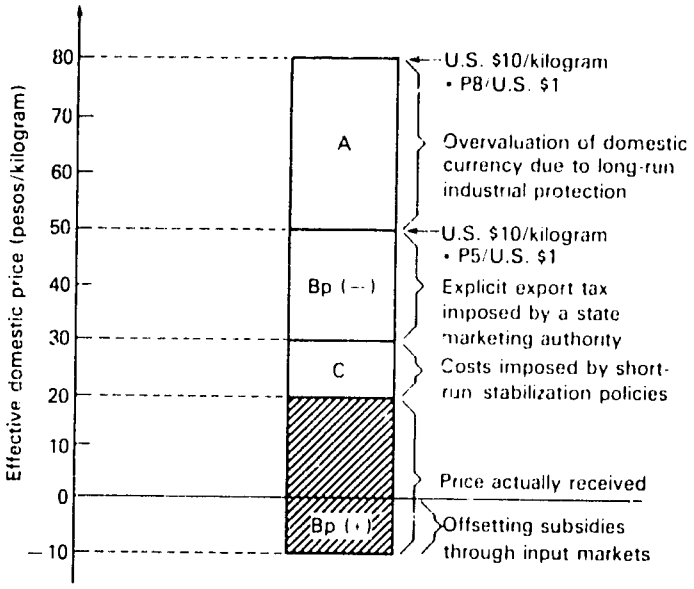
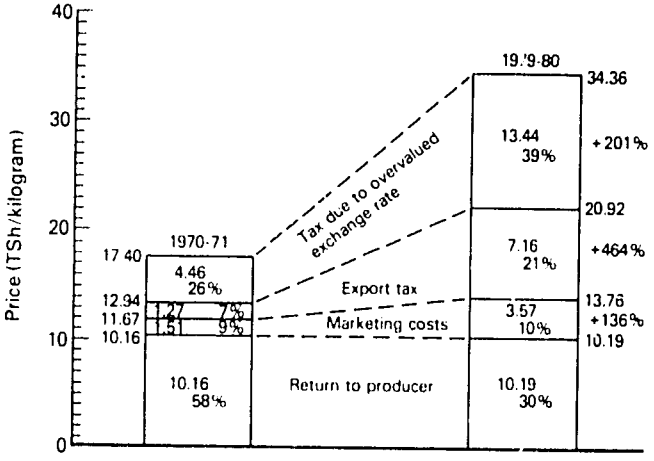


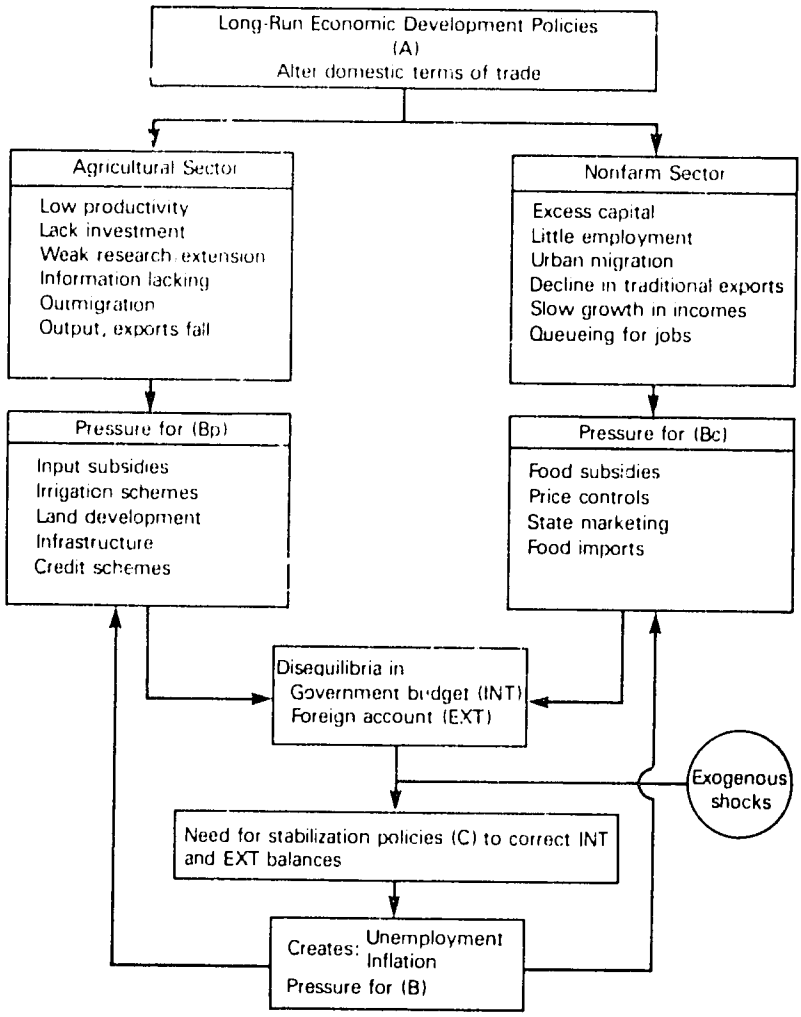
FIGURE 4.2 Taxation of Tanzanian coffee producers



bling in the free-on-board export price, the return to producers was virtually unchanged over a decade.

The manner in which the three broad types of policy interact is shown in figure 4.3. A long-run economic development policy (A) that distorts the domestic terms of trade against the agricultural sector tends to result in a stagnation of investment and output, reducing the supply of food. On the other hand, outmigration from agriculture is encouraged, but an overly capital-intensive nonfarm sector provides too few employment opportuni-

FIGURE 4.3 Food subsidies in a political economy setting



ties, and real income growth is slow. Demand for food from the marketed surplus increases, resulting in upward pressure on food prices. This fosters agricultural-sector (Bp) and food-sector (Bc) policies. The latter are aimed at providing food for the swelling urban population, often by importing, controlling consumer prices, or introducing food subsidies. These policies frequently further tax agricultural producers. They may be accompanied by politically visible measures to bolster farm output, such as installing irrigation systems, building infrastructure, and subsidizing inputs. Such measures offer partial but inadequate compensation for the burden imposed on agriculture by policies of type A. Furthermore, they often represent inefficient uses of public capital.

The increased demand for imports and the slow growth of exports place pressure (EXT) on the external account, while the government budget is increasingly under pressure (INT) from subsidies, losses of state marketing authorities, and costs of agricultural policies (Bp). Fundamental disequilibria have been created, which increase the economy's vulnerability to exogenous shocks (rises in import prices for food, energy, or raw materials; droughts or floods; declines in export receipts; and so forth). In the face of exogenous shocks, short-term policies are often hurriedly introduced to deal with crises in internal or external imbalances. They frequently reduce aggregate demand and lead to unemployment, or they result in further inflation. Such outcomes reinforce the pressure for food and agricultural policies to alleviate such side effects. The pressure for continued food subsidies is further reinforced.

In summary, it is argued that food subsidies are simply one element of a set of policies, rather than an isolated strategy. They may often arise because of the results of other policies, and they may themselves contribute to circumstances that perpetuate the need for them.

Alternative Strategies

The short-run dilemma confronting the policymaker is: In the face of rising costs, should prices be raised or should consumers be protected by subsidies? The consideration of alternative strategies requires that both short- and long-run options be considered. Lowering the price of food through subsidies is only one of a number of strategies that can be followed (Perrin and Scobie, 1981). These include policies that increase the supply of food. By creating an economic climate that taxes the agricultural sector, the rate of growth of food supply can be severely impeded.

An analysis of agricultural price distortions in thirty-four developing countries has shown that, in countries with high taxation of agriculture, the growth rate of output was 28 percent and that of exports was 43 percent

below the rates in countries classified as having low distortions.[8] Both the level and the mix of output of the agricultural sector have been affected by economic policies. Ironically, it is often the output of basic food commodities that suffers most, causing upward pressure on their real prices and creating a perceived need for food subsidies. For example, the prices of industrial and export crops in Brazil doubled in relation to the prices received by producers of basic food crops over the last two decades. While the growth rates of soya, sugar, and citrus production rose, the *actual outputs* of rice, beans, and cassava fell (Homen de Melo, 1983). But artificially raising the prices of basic foods to producers can, conversely, draw resources from the production of export crops, with a consequent fall in foreign exchange earnings. This leads to the need to ration foreign exchange; essential imports are cut, reducing output and employment in the urban industrial centers and creating pressure for food subsidies.

In order to subsidize food prices effectively, additional quantities must be forthcoming. These can only come from domestic production or imports. In the short run, the increase in domestic production can result from higher prices, lower input costs, or forced delivery. The first two mean higher budget outlays and, for subsidized inputs, inevitable leakage to other crops (Barker and Hayami, 1976; R. Ahmed, 1978; and Tolley, Thomas, and Wong, 1982). The use of forced delivery is undoubtedly appealing because it lowers the budgetary cost of acquiring the extra food. In fact, it is possible to devise self-financing schemes so that revenue from subsidized sales to consumers pays the farm price for compulsory distribution (or even generates a surplus).

If farmers treated the tax imposed on them by procurement or delivery schemes as a fixed cost, then supposedly it would not alter their marginal incentives to produce. They could still sell the balance at the now higher prices on the residual open market. But the incentive to avoid the tax will still exist, and farmers will seek untaxed alternatives. With forced deliveries, the cost of the food subsidy is shifted from the government to the farmer (de Janvry, Siam, and Gad, 1983). Although the short-run loss in efficiency may be minimal, regressive transfers from low-income rural households to middle-income urban households can result.

The downward pressure on real exchange rates brought about by general development policies distorts the domestic prices of all traded goods, both final goods and intermediate goods. In the case of fertilizer, a free-trade policy for nitrogenous fertilizer would lower the domestic price in Egypt by 30 percent and expand rice output significantly (Antle and Aitah,

8. For a review of distortionary pricing, see Brown (1978). The comparison of growth rates is from Agarwala (1983).

1983). An overvalued exchange rate lowers the cost of imported fertilizer to Brazilian farmers, but this is more than offset by protection to the domestic industry.[9]

As macroeconomic constraints frequently determine the evolution of food subsidy strategies, it can be useful to calculate either a measure of the benefit-cost ratio of alternative strategies or, alternatively, their cost effectiveness. This can be found as either the increased intake by low-income groups per unit of foreign exchange (saved or earned) or per unit of government expenditure. For example, the treasury cost needed to achieve a given increase in caloric intake by low-income households can be a useful aid in selecting among alternative subsidy policies (Perrin and Scobie, 1981). All foods, a group of foods, or one staple food may be subsidized. Social benefit-cost ratios have also been applied to food subsidy schemes (Mateus, 1983; Scandizzo and Knudsen, 1980). By valuing the caloric intakes of those who consume below the minimum, it has been shown that India's ban on private exports of foodgrain together with the procurement scheme for ration shops have constituted socially valuable interventions (Scandizzo and Swamy, 1982). This approach represents a useful way in which some of the macroeconomic costs can be incorporated into an analysis of alternative strategies.

Fiscal Costs of Subsidies

The cost of subsidies as a share of total public expenditure, as a share of the government's operating deficit, or even as a share of gross domestic product (GDP) can be substantial. This has been well documented by J. Davis (1977) for a number of countries up until the mid-1970s. Subsequent studies have confirmed the continued and widespread nature of high budgetary costs.

In 1980/81, Egyptian food subsidies were 20 percent of current expenditures and 7 percent of GDP (Alderman, von Braun, and Sakr, 1982). The deficits of the Korean Grain Management Fund have typically been about 3 percent of government expenditure (Tolley, Thomas, and Wong, 1982; Braverman, Ahn, and Hammer, 1983; and Taylor, Horton, and Raff, 1983). The rice subsidy alone represented 14 percent of the government deficit in Peru in 1980 (Orden, Roe, and Schuh, 1982) and has been between 1 and 2 percent of GDP. Sri Lankan subsidies reached 14 percent of government expenditure and 6 percent of gross national product (GNP) by the late 1970s (chapter 18), while the current subsidy in India represents about 9 percent of government expenditure (chapter 16; R. Ahmed, 1988).

9. The result is a decline in crop output (Zylbersztajn, 1983).

In the mid-seventies, the Bangladesh food subsidies represented between 15 to 27 percent of current government expenditure (R. Ahmed, 1979), whereas in the same period the Zambian maize subsidy represented 50 percent of the agricultural budget and 10 percent of the government's capital expenditure (chapter 21). In Mexico, the deficits of CONASUPO have recently been between 3 and 9 percent of the total fiscal deficit (chapter 20), whereas in the late 1970s the direct costs of Chinese food subsidies have been reported as 23 to 26 percent of government revenue (Lardy, 1983).

The actual share of total costs is not in and of itself either cause for concern or evidence of inappropriate policies. Positive social returns can come from government expenditures, be they in education, health, housing, defense, or food subsidies. Too much attention has probably been drawn to the fiscal cost of food subsidies as a share of revenues, expenditures, or deficits. However, two aspects do warrant further consideration; these are the potential rapid rise in the budgetary costs and the variability of food subsidy expenditures.

When food subsidy costs rise rapidly and demand an increasing share of government resources, there are a number of likely responses. In the first place, the fiscal deficit may increase, leading to higher borrowing (domestic or foreign) or expansion of the monetary base (Bigman, 1980). Second, to the extent that food subsidy costs rise faster than government revenues, other items of expenditure tend to be reduced. If the food subsidies are part of the agricultural vote, as is often the case, government outlays for either current or capital investment in agriculture may be affected.[10] To the extent that food subsidies are allowed to depress producer prices, pressure to increase compensating input subsidies may add to the fiscal costs.

Third, rapid rises in food subsidies increase the tendency to shift the burden of the fiscal costs. There is a wide range of mechanisms used to achieve this. By using forced deliveries, the government attempts to acquire additional supplies at low cost, shifting the burden to farmers.[11] The use of multiple exchange rates is another device for disguising the true cost of a food subsidy scheme relying on government-controlled imports. Many countries have used a preferential rate for food imports, which has the effect of holding down the domestic currency costs of food imports.[12] The real or full social cost is not altered, however, by disingenuous accounting.

10. For an analysis of the Egyptian experience, see chapter 12 and von Braun and de Haen, 1983.

11. Compulsory deliveries to the Tanzanian National Milling Corporation at extremely low prices have been used to hold down the cost of a maize subsidy to urban consumers (Keeler et al., 1982).

12. Details of the Egyptian multiple exchange rate scheme are given in Scobie, 1983. Ahmed (chapter 15) shows that in Bangladesh valuing wheat imports at the shadow rather than the official exchange rate raises the subsidy by 20 to 40 percent.

In this case, the additional costs appear as a subsidy from the central bank on its foreign exchange transactions.

The working capital for state food marketing agencies is often met by providing access to credit at concessional rates from the central bank, further disguising the true cost (chapter 16). Alternatively, commercial banks may be required to provide credit under governmental guarantee. This involves two sources of hidden costs. First, the interest rate is generally below market rates, and second, such obligations displace lending to the private sector, thus reducing private investment in the economy (R. Ahmed, 1988). In this way, public consumption is substituted for private investment.[13]

In some countries, the food subsidy scheme is operated by a semiautonomous state agency, which, in an effort to hold down the budgetary cost to the central government, is required to be self-financing (Senauer, Roe, and Greene, 1982). This leads to further price distortions as the agency tries to generate revenue through taxes on some commodities (generally imports) in order to cover the losses of the subsidized staples. If food subsidies are seen as part of the welfare budget of a central government, then it is not clear that they should be financed by food taxes. Furthermore, these agencies often have access to both foreign exchange and working capital below the market rates, so their financial autonomy is more apparent than real, and the full costs of the subsidies must be sought elsewhere.

Further fiscal costs can arise from policies that attempt to reduce the seasonal price variation over the year. In an effort to reduce or eliminate this variation, governments may have to undertake more storage than private traders would find worthwhile. Part of the costs of the food subsidy is then the implicit subsidy on storage.[14] The incentive for private stockholding declines, and the flow of raw material to the processing industry is impeded, making the return to capital in, say, milling less attractive—a further indirect cost of the subsidies (Mears and Moeljono, 1981).

In addition to the food subsidies' share of total budgetary costs, their variability over time is notable. Where the government depends on acquiring grain on domestic or international markets to support the food subsidy scheme, unanticipated changes in domestic output or import prices can lead to major swings in the budgetary cost of a food subsidy scheme. Nowhere is this more dramatically seen than in the food subsidy budgets of Tanzania, Egypt, Korea, Pakistan, Bangladesh, Morocco, and Sri Lanka during the period 1972–74. In the presence of a food subsidy scheme with

13. This ignores the possibility that food subsidies are a form of social investment in human capital formation, a proposition for which the evidence is notably slim.

14. Estimates of this explicit cost for Indonesia are given in Siamwalla, 1988. For Korea, see Tolley, Thomas, and Wong, 1982, which estimates the effect on producers, consumers, and the government budget of seasonal price stabilization.

stable consumer prices, this instability is shifted to other sectors, be it farmers' incomes, foreign exchange reserves, or government expenditure on other activities. The massive swings in budgetary costs pose severe burdens on the financial planning of food agencies, which seldom have the financial flexibility to deal with them. R. Ahmed (1988) notes that this may evoke speculative response from private trade, as the ability of the public marketing operation to sustain its activities becomes in doubt.

Food subsidy schemes sometimes have their rationale, at least in part, in holding down the costs of the public sector wage bill. In fact, part of the wage costs are met by supplying cheap food to public servants. This further disguises the true fiscal cost of the subsidies.

In summary, the fiscal costs of food subsidies represent neither their social importance nor their social costs. Faced with competing claims for limited public resources, there is a tendency to shift the costs of food subsidies to other sectors. The apparent budgetary cost is thereby lowered; the real social costs are simply redistributed.

Taxation

To the extent the costs of subsidies appear as budgeted expenses, "it is usually neither possible or particularly meaningful to try to isolate the exact sources of finance. At any point in time it becomes a policy decision whether, in the event of a change in the subsidy, any particular revenue item should be altered or in what form recourse to financing should be changed" (J. Davis, 1977).

If the financing is to be met by a tax on another commodity, as in the case of a self-financing state food agency, then the implications of a change in the subsidy level for a given food item become clearer. However, in general, food subsidy expenditures are indistinguishable from other items of government expenditure. Their cost is generally met by various sectors through direct and indirect taxes and through public borrowing. In the consideration of the distribution of the benefits of food subsidies, the distribution of the costs has rarely, if ever, been adequately captured. Certainly, transfers from producers to consumers have been recognized and estimated (de Janvry, Siam, and Gad, 1983; von Braun and de Haen, 1983; Bale and Lutz, 1979; and Scandizzo and Bruce, 1980), confirming that subsidies and associated distortions to producer prices set up an extremely complex pattern of taxation transfers between various groups.

A full statement of the incidence of the taxation burden requires a model with which to predict the effect on the income of each group as owners of factors of production, as well as on their consumption. Clearly, this is an enormously complex task, and one that is not just applicable to the question of food subsidies. But until the incidence of both the benefits and

the taxes are incorporated, knowledge of the true distributional effect of subsidies will remain sketchy.[15]

Inflation

The effect of food subsidies on inflation hinges on the extent to which the government's budget deficit is financed by monetary expansion through the central bank. An explicit monetary model was built for Egypt in order to address this question. It concludes that, given the historic pattern of deficit financing, a 10 percent rise in food subsidies would increase the inflation rate by 5 percent (Scobie, 1983).[16] Since between 30 and 40 percent of the total deficit has been financed in this manner (S. Ahmed, 1984; Tolley, Thomas, and Wong, 1982), the potential effect on inflation is significant. In the late 1970s, the Korean money supply was expanding by 30 percent per year, or W 600 billion, while the deficit of the Grain Management Fund (GMF) for rice and barley was W 340 billion in 1978. "This is not to suggest that the GMF deficit is necessarily responsible for half the inflation, but it does suggest that the contribution to inflation is probably substantial" (Tolley, Thomas, and Wong, 1982).

Inflation reduces the real cost of subsidized foods where their nominal prices are held constant for fear of political reprisals. For example, the nominal price of wheat to consumers was held constant in Egypt from 1965 to 1977, when it was reduced. During that period, the real price was almost halved (Scobie, 1981), increasing the pressure on subsidy expenditures.

To the extent that the domestic inflation rate exceeds the average for its trading partners, a country's fixed nominal exchange rate will become increasingly overvalued, discouraging production in the traded goods sector and shifting resources to the nontraded goods sector. This not only disguises the true social cost of food imports but also lowers incomes in the predominantly agricultural export sector. It tends to shift the demand to home goods whose relative prices will rise. Where capital gains are not taxed or are taxed at rates significantly less than those for current income, then the speculative demand for real assets will also rise. The net effect of these forces will be to raise the real prices of assets such as housing, and this is likely to be particularly felt by lower income households.

In short, increasing inflationary pressures through deficit financing of food subsidies will set off a chain of events in a distorted economy, the net

15. An analysis of the distribution of public expenditures in health education, electricity, piped water, and sewerage is given in Selowsky, 1979. For an attempt to incorporate the distribution of both the costs and returns of a public expenditure program, see Scobie and Posada, 1978; see also De Wulf, 1975.

16. Note that "econometric analysis, while relevant, may be expected to encounter significant empirical problems" (J. Davis, 1977). This may help to explain the paucity of such studies.

outcome of which may or may not constitute a real income gain to the poorest households even under well-targeted subsidy schemes.

When considering inflationary effects, care should be taken to distinguish between ongoing sustained rises in the general price level (of the nature discussed so far) and one-time increases. It is sometimes argued that removal of a subsidy would be inflationary, based on the fact that the nominal price to consumers would rise. Certainly, if a previous artificially low price has been recorded in the construction of the price index, then the new higher price will cause a rise in the index. But it will be a one-time rise, and if the reduced subsidy leads to less deficit financing by monetary expansion, the rate of inflation would in fact fall.

Foreign Trade and Exchange

There are few if any food subsidy schemes that do not have implications for the volume of trade in the subsidized good, the volume of trade in other goods, and a country's foreign exchange position. Indeed, as most subsidized foods are internationally tradable, decisions concerning the level of food subsidy are often influenced by the concerns for trade, foreign exchange, and government revenues from trade taxes. This section considers the effect of subsidies on the volume of exports and imports of the subsidized good, on trade in other commodities, and on foreign exchange.

Several countries intervene in the export markets of major food commodities, with the principal aim of diverting supplies from exports to the domestic market. This can be done through a state monopoly of grain trading (as in India or Egypt), through export taxes (as in Thailand), or through export quotas (as in the case of beef in a number of Latin American countries). A principal attraction of such a policy is that it provides increased quantities of food at lower cost to domestic consumers without any explicit government budget cost. In fact, by taxing exports the government acquires revenue that can be used to further subsidize the domestic price to some or all consumers.

Data for the Egyptian rice market are helpful in illustrating this policy (de Janvry, 1983); they are summarized in table 4.2. The rice market has traditionally been a source of revenue for the government. In recent years, however, the cost of selling subsidized rice through the ration shops has been just offset by the revenue generated from the export sales at above the procurement price. In this way, the consumer subsidy has an apparently neutral effect on the government budget—it is self-financing. However, the gain to consumers has come at the cost of an implicit tax on rice producers. Between 1976 and 1981, about 80 percent of the total consumer benefits of cheap rice came from the tax on rice producers (de Janvry, Siam, and Gad, 1983). This tax depressed domestic output, and diversion

TABLE 4.2 Egyptian rice market, 1976

Item	Quantity (1,000 metric tons)		Price (£E per ton)
Output	2,300	Average to farmers	51
Marketed surplus	1,449	Open market	60
Less open-market sales	184	Procurement	36
Forced sales to government	1,265	FOB exports	147
Less exports	345	Paid by consumers	50
Subsidized consumption	920		

to the local market reduced exports. Egypt will soon become a rice importer if it is to sustain the level of subsidized consumption.

By offering producers the world price for rice, it is estimated that total output would rise from 2.4 to 3.8 million tons, which would increase export earnings and farm incomes significantly. A direct subsidy could be paid to those qualifying for a ration. The foreign exchange account would gain, although the output and traded volumes of crops that compete in production and consumption would modify the outcome. The cost of the subsidy to consumers would presumably be more equitably distributed. At the very least, alternative policies that imply different deadweight losses per dollar of surplus transferred from producers to consumers should be examined (Gardner, 1983).

Thailand's rice sector is another important example of the use of trade policy to achieve domestic goals. The export tax on rice raises the export price received by Thailand (assuming it faces a less than perfectly elastic foreign demand) but lowers the domestic price as it diverts supplies from exports to home consumption. Thailand may be able to offset the welfare losses of its intervention in the rice market by capturing a higher price from foreign consumers, that is, by implementing an optimal export tax.[17] In any event, regardless of the transfer from foreigners, much of the gain to consumers is an implicit tax on Thai producers (Trairatvorakul, 1984).

Whereas many studies focus on a single market, a food subsidy affects other commodities through substitution in consumption and production. The results of an Indonesian study incorporating four basic staples are shown in table 4.3. Food policies can have both a stabilizing role (food security) and a provisioning role (food consumption), and these results

17. There is considerable debate about the elasticity of foreign demand and whether in the long run Thailand can exploit this. For an analysis of the welfare costs and transfers under different assumptions, see Wong, 1978. The effect on the optimal export tax on distortions (through overvaluation of the baht or through input market subsidies, for example) is analyzed in Tolley, Thomas, and Wong, 1982. The effect of changes in rice prices on income distribution are estimated in Trairatvorakul, 1984.

TABLE 4.3 Effects of alternative food policies in Indonesia, projections for 1990

Food Policy[a]	Rice Imports (metric tons)	Foreign Exchange (million of dollars)	Calories per Capita per Day	
			Mean	Standard Deviation
Base	1.5	255	1,986	[illegible]
Variant A	0.3	45	1,950	118
Variant B	−2.3	−842	1,878	140

SOURCE: Tyers and Rachman, 1982. Reprinted by permission of Elsevier Science Publishing Co., Inc. Copyright 1982 by the Society for Policy Modeling.

[a]Under the base policy, wheat and rice prices are stabilized, and rice consumers are subsidized. Under variant A, there is no stabilization, but the subsidy on rice is maintained. Under variant B, there is no stabilization, and there is a 20 percent increase in consumer prices of rice and wheat.

show that alternative policies affect both the level and variance of caloric consumption in staple foods.

In addition to reducing exports, other countries have had to increase their imports in order to support their food subsidy programs. Wheat is the most widely subsidized and imported food. In an attempt to relate wheat subsidies to wheat imports, an analysis of fifty-three countries was undertaken. They were grouped in order of their annual average change in the real price of bread over the decade 1970–80, and for each group the rise in wheat imports per capita was computed. The results (table 4.4) show a clear tendency for the greatest rises in imports to be associated with a falling real consumer price. A fall of, say, 5 percent per year amounts to a substantial real decline after a decade. This has led to a sharp increase in consumption, which has not been met by increases in domestic production. In fact, many countries have deliberately held down producer prices in order to lower the budget cost of food subsidies, which shifts part of the burden to farmers. But it also increases dependence on imported wheat.[18]

The effect of domestic pricing on wheat imports is again evident in table 4.5. Here the countries are ranked by the relative price of bread to rice at retail. Based on world prices, that ratio would be about one to five (Byerlee, 1983). Countries that maintained a significantly lower ratio in 1980 were those with the largest average increases in per capita wheat imports (both commercial and concessional) over the preceding fifteen years.

Clearly, domestic policies impinge on foreign trade and exchange. However, the fact that food subsidies increase the demand for or reduce

18. Brazil increased the producer's price of wheat as an import substitution policy, and in fact it has recently exceeded the world price by 60 percent. However, at the same time the consumer price has been drastically reduced, so that consumption rose much faster than production and imports rose substantially. The foreign exchange costs of wheat imports have been more than 30 percent higher as a result of consumption subsidies (chapter 19).

TABLE 4.4 Changes in the real price of bread and net wheat imports in developing countries

Annual Average Percent Change in Real Price of Bread, 1970–80	Country[a]	Average Rise in Net Wheat Imports from 1961–65 to 1979–81 (kilograms per capita)
−11.0 to −3.1	Iraq, Ethiopia, Zaire, Egypt, Jordan, Bolivia, Iran, Mexico, Algeria, Guatemala, El Salvador, Brazil, Kenya, Tanzania, Ghana, Dominican Republic	28
−3.0 to −0.1	Paraguay, Tunisia, Morocco, Libya, Sudan, Ecuador, Pakistan, Panama, Malawi, Cameroon, Somalia, Burundi, India	21
0.0 to 4.9	Zambia, Hong Kong, Singapore, Uruguay, Ivory Coast, Upper Volta, Turkey, Republic of Korea, Chile, Venezuela, Costa Rica, Colombia, Thailand, Lesotho	13
More than 5.0	Argentina, Philippines, Malaysia, Burma, Bangladesh, Peru, Sri Lanka, Senegal, Indonesia	6

SOURCE: Data from Byerlee, 1983.

[a]Countries are listed in ascending order.

TABLE 4.5 Relative prices of bread and wheat imports in developing countries

Ratio of Price of Bread to Price of Rice in 1980	Country[a]	Average Rise in Wheat Imports from 1961–65 to 1979–81 (kilograms per capita)
0.00 to 0.49	Sudan, Turkey, Iraq, Mexico, Egypt, Bolivia, Tanzania	25
0.50 to 1.49	Brazil, Pakistan, Sri Lanka, Zambia, Korea, Ivory Coast, Hong Kong, Panama	10
More than 1.50	Cameroon, Liberia, Rwanda, Costa Rica, Burma, Philippines	3

SOURCE: Data from Byerlee, 1983.

[a]Countries are listed in ascending order.

the supply of foreign exchange raises the possibility that the country's external circumstances will impinge on its domestic food policy. A number of studies of the import of foods by developing countries have recognized this possibility and have included a variable purporting to represent import capacity as a determinant of food imports.[19] These studies have generally concluded that the response of food imports to foreign exchange supplies is fairly low (Krishna and Chibber, 1983; Abbott, 1979; Bautista, 1978; Hall, 1980; Islam, 1978; and Scobie, 1981).

A further step was taken by some authors in trying to make the domestic policy itself a function of the foreign exchange situation. Lattimore and Schuh (1979) note, "there are two basic forces impinging on the [Brazilian] government with respect to beef export policy. One is the desire to hold down the price of beef to domestic consumers. The other is the need for foreign exchange receipts." A model of Egyptian wheat imports in which the consumer subsidy was itself endogenous found that changes in foreign exchange receipts had little effect on commercial wheat imports. A fall in receipts of a dollar led to only a five-cent reduction in expenditure on wheat imports (Scobie, 1981).

This leads to a crucial and little explored aspect of food subsidies. If a scheme depends on imported food, there is likely to be considerable reluctance to vary total food imports with changes in world prices or with fluctuations in export receipts. This problem comes into even sharper focus when it is recalled that variability of world prices for important foods has been significantly increased by the policies of major importing and exporting countries (Shei and Thompson, 1977; Bale and Lutz, 1979; and Josling, 1980).

Consider, for example, the effects of an unanticipated rise in the world price of imported wheat. If this leads to only a minor adjustment in the quantity of wheat imported, then the foreign exchange allocation for wheat must rise. This can be met by drawing down reserves, by borrowing, or by reducing other imports. Unexpected changes in the level of imports of raw materials, parts, and intermediate products will destabilize industrial output. As a consequence, the existing capital stock is likely to be underutilized. Furthermore, the rate of growth of the capital stock itself may be destabilized if food imports take priority over imports of machinery and capital goods.

The possibility of food imports crowding out the imports of essential raw materials and capital goods has been noted by a number of researchers. Bhagwati (1978) notes that essential consumer goods such as food have remained relatively large proportions of total imports in many developing

19. Import capacity is variously measured as foreign exchange reserves or reserves plus export receipts. Neither measure is entirely satisfactory, as both ignore the potential to raise foreign loans or acquire additional foreign aid.

countries. Furthermore, as in Chile, whenever foreign exchange "shortages" become acute, governments often tend to postpone their importation of capital goods rather than of essential consumer goods.

In the case of Indonesia, Pitt (1981) notes that "with export receipts falling, cuts in imports were necessary. Food shortages mandated the use of much of the available foreign exchange for food imports. As a result, imports of raw materials were cut back drastically." Further evidence of this phenomenon comes from Tanzania. Lofchie (1978) argues that "due to the severe shortage of foreign exchange and the urgent need to use remaining currency reserves to finance immediate food requirements, the Government was compelled to impose stringent limitations on other imports. Since Tanzania had long since all but eliminated the acquisition of luxury items and other non-essentials, the new restrictions affected the importation of economically vital items such as raw materials for industry, new capital goods and spare parts. The result was a serious economic slump."

Finally, Carr (1979) makes explicit the problem in Egypt: "The worsening foreign exchange crisis, which was directly related to the rise in public consumption, made it difficult for many firms to obtain imports of raw materials and spare parts. . . . Capacity utilization rates consequently fell."

To date, little analytical work has been addressed to measuring this potentially costly aspect of food subsidies (Junginger-Dittel and Reisen, 1979). An Egyptian case study suggests that a 10 percent rise in the price of commercial food imports can lead to a decline in current output and new investment in the industrial expenditures of between 1 and 2 percent. Likewise, a decline in total foreign exchange expenditures of 10 percent would reduce industrial output and investment by 4 and 6 percent, respectively. A decline of one dollar in foreign exchange availability reduces food imports by only five cents, while raw materials and machinery fall by fifteen and thirty cents, respectively. These findings confirm the hypothesis that, with a food subsidy scheme that depends on foreign supplies, priority is given to food imports in the allocation of a fixed amount of foreign exchange. Imports of raw materials needed to maintain output in the industrial sector are accorded priority over capital goods, as new investment is presumably seen as postponable (Scobie, 1981).

Instability, whether due to fluctuations in domestic output or world prices, is never costless and cannot be willed away. There must be an adjustment mechanism, and the mechanism chosen will determine who bears the cost of the instability.

If the inelastic demand for imported food engendered by a food subsidy scheme results in fluctuations in output and affects incomes and the growth of employment among poorer groups, then a legitimate question

arises about the incidence of those costs. Is maintaining food consumption by destabilizing employment an appropriate strategy? Would the holding of extra foreign exchange reserves be more or less costly? And how would the incidence of the costs and benefits change? A better understanding is needed of the effect of instability on, say, the variance of consumption of an imported good under different food subsidy schemes or different monetary and exchange rate policies.[20]

Certainly, schemes to provide compensatory finance for food imports have a potentially important role (Huddleston et al., 1981). In cases where the marginal propensity to import food is low, they would contribute more to stabilizing the imports of other essential materials and capital goods. Recent work raises the possibility that use of a compensatory scheme to reduce the variance of food consumption does not necessarily require full compensation for deviations in the food import bill if a parallel scheme is operating for exports. In addition, it is possible that the food facility could actually destabilize nonfood consumption. The problem arises because two targets—reducing the variance of consumption of both food and nonfood—will in general require two instruments (Green, 1983).

It is obvious that food subsidy schemes that divert exports to home consumption or that increase the demand for imported food create pressure on the supply of foreign exchange. But this is a partial view; a richer framework is needed to assess the effect of government spending for food subsidies on the balance of payments and exchange rates. Because many countries maintain fixed exchange rates, the true exchange market pressure can be analyzed only by taking both the change in the net foreign asset position together with changes in the shadow or parallel market price of foreign currency. In a monetary approach to the balance of payments that captures the deficit financing of food subsidies, a 10 percent rise in expenditures on food subsidies would reduce the Egyptian stock of net foreign assets by about 2 percent and lead to a devaluation of the parallel market exchange rate of 3 percent (Scobie, 1981). In general, this would lead to a rise in the domestic prices of tradables relative to home goods (Dornbusch, 1974a). This would have implications for the allocation of resources, for the outputs of traded and nontraded goods, and for incidence of the cost of food subsidies. Alternatively, the excess demand for foreign exchange is often eliminated by import controls (tariffs or quotas), whose incidence as an implicit tax on the exportable goods sector has been shown to be significant (Sjaastad, 1981; Sjaastad and Clements, 1981; and Garcia, 1981). Ironically, a food subsidy scheme creating excess demand

20. The beginning of an analytical framework can be found in Black, 1976, and Fischer, 1977. These models are extended to examine the effect of alternative policies on the variability of food consumption in Scobie, 1980. For an analysis of alternative food trade and stock policies, see Bigman and Reutlinger, 1979.

for foreign currency to finance food imports may lead to a taxing of agricultural export production, thus reducing total export receipts (Keeler et al., 1982).

Real Incomes and Income Distribution

While changes in the level of food subsidies have a direct effect on the consumption of a particular good, they also alter real incomes and expenditure patterns. Consumption levels of other staples are affected, and more generally the demand for various classes of goods is altered. When food subsidies are substantial, these changes can affect aggregate demand in broad sectors of the economy, with concomitant changes in output and demand for factors. This results in further effects on real incomes and income distribution. The purpose of this section is to review some of the models that attempt to capture these effects and to examine the results they have provided concerning the effects of food subsidies (von Braun and de Haen, 1983).

One family of models, called computable general equilibrium models, are essentially microeconomic models in which monetary variables never appear. They are useful for analyzing long-run trends and real resource shifts in the economy, being essentially barter models. This does not imply that they are in any way crude; they can be extremely sophisticated and highly disaggregated, based on a large input-output scheme. For example, they can analyze the effect of a change in protective tariffs on prices, output, and factor use in twenty to thirty sectors of the economy, but they cannot adequately analyze macro- or monetary policies, nor predict prices (Dervis, de Melo, and Robinson, 1982).

This type of model has been used for analyzing food policies (Eckaus, McCarthy, and Mohie El-Din, 1979; Eckaus and Mohie El-Din, 1980; McCarthy and Taylor, 1980). Essentially, they are multisector models that determine (1) output levels and relative prices for each sector, (2) value added, and (3) incomes to factors (labor, capital, and land), together with the distribution of total income between rural and urban groups and among income groups. The shares of total income going to labor, capital, and land are assumed to be constant in each sector, and these are apportioned to household income groups, assuming the share of income from land, labor, and capital in each income group remains constant.

What do the models predict would happen if a food subsidy is removed? The results for Pakistan illustrate the general pattern (McCarthy and Taylor, 1980). Because the demand for food is very inelastic, the drop in consumption is much less than the percentage rise in price. The decline in real income that accompanies the rise in the price of wheat in this case

reduces the demand for nonfood products so that aggregate demand falls, and there is a contraction in the entire economy; real GNP falls 2.6 percent. Naturally, the government deficit declines. The decline in aggregate output is of course nothing more than a reflection of the increased government saving in the absence of any offsetting increases in private or public consumption or investment. Alternatively, although these models are internally consistent and provide a general equilibrium solution, they have achieved this "closure" by requiring nominal savings to equal a fixed level of investment. If government savings rise, then aggregate demand must fall—so that total savings are equated to the fixed level of investment.

The models allow few opportunities for adjustment in the economy. Nominal wages are taken as fixed, as is real investment and the exchange rate. As a result, all of the adjustment of a change in subsidy falls on basically one variable, causing marked swings. An increase in the price of food sufficient to reduce the cost of Egyptian food subsidies by about 50 percent was found to reduce GDP by 5.4 percent, to raise living costs by 2.2 percent in the rural sector and 8.2 percent in the urban sector, and to reduce real urban income by 14 percent, the heaviest burden falling on the poor (Taylor, 1979). The reaction of any policymaker to such a prospect would rightfully be one of horror: why would he want to introduce a move that would contract the economy by 5 percent, add to inflation, and reduce real incomes? In fact, his immediate and most rational response would be to ask his economic analyst, "If what you say is true, would it not be wise, politically cogent, and compassionate of me to increase food subsidies, as not only will the poor benefit, but the economy will expand, output and employment will rise, inflation will fall, and real incomes will rise?" If only life were so simple.

In the short run, with so many variables taken as given, the only solution offered to the policymaker by these models contemplating a reduction in subsidies is to allow inflation to soar. Consider the problem faced by a country whose spending on food subsidies is a significant share of a deficit that is being monetized and that is contributing to present inflation. Pressure exists to reduce subsidies and so ease the inflationary tendency of the higher government budget deficit. Following a cut in subsidies, real output (according to these models) will decline, as the higher food prices reduce demand for other goods. To offset this fall in real income, wages will have to rise, which then will be passed on in higher prices. Increases in wages, provided they increase faster than the price increases that they engender, will raise aggregate demand enough to close the real GDP gap but only with accelerating inflation (Taylor, 1979). In short, to reduce the inflation associated with deficits due to subsidies, the policymaker is advised to reduce subsidies and accept either a major economic contraction or gallop-

ing inflation—hardly a happy state of affairs, but one that has been extensively implied.[21]

This approach generally assumes a closed economy. Output and consumption levels are not related to world prices; rather, all prices are domestically determined, given the fixed quantities of traded goods set by the government. Furthermore, food supply is seen to be inelastic, so that upward pressure on prices calls forth little or no extra output. There is an infinite supply of labor to the nonfarm sector at the fixed nominal wage rate and a permanent excess capacity in the industrial sector. It is these rigidities or structuralist features of the economy that mislead efforts to estimate macroeconomic consequences of a change in food subsidies. Naturally, models that allow for changes in investment, in exchange rates, in industrial capacity, in the movement of labor between sectors in response to changes in wages, and importantly, for agricultural output to respond to high prices do not necessarily imply either massive contraction or accelerating inflation if subsidies were reduced.[22]

In short, there is no evidence that expenditure on food subsidies impedes or fosters output and growth. The answer hinges on other distortions and accompanying policies. The same conclusion would apply to the distributional effects of food subsidies. Although the evidence suggests that subsidies are generally progressive in terms of public expenditure, their net distributional effect depends on how that expenditure is met. If inflationary financing, forced procurement, and reductions in other social investment and transfer programs provide the resources to subsidize food to a wide spectrum of both the needy and the middle-income urban groups, then it is less clear that food subsidies are strongly progressive.

Food Prices and Real Wages

The excerpt in the opening pages of this chapter highlights the concern that an increase in food prices will erode increases in nominal wages—that real wages will fall. In general, what can be said about the effect of food subsidies on wages? Clearly, in the context of the models discussed earlier, a change in demand for nonfood items due to the real income effect of a change in subsidies has no wage effect where it is assumed that the

21. See Taylor, 1979; Chichilnisky and Taylor, 1980; McCarthy and Taylor, 1980; Cardoso, 1981; Taylor, Horton, and Raff, 1983; Lustig, 1983; and Taylor, 1982. For a discussion of some limitations of these models, see Schuh, 1980.

22. For a comparison of closure rules for general equilibrium models that determine the adjustments permitted and therefore the outcome of policy changes, see Dethier and Estahani, 1981. A model with considerable flexibility is developed in Amranand and Grais, 1984. Changes in the export duty on rice that would raise the domestic price are found to have minimal positive effects on GDP.

nominal wage is constant—that labor flows costlessly into and out of the nonfarm sector at the given nominal wage.

An alternative view is that the total labor supply is given and that its allocation between sectors depends on wage rates. If food subsidies affect the demand for labor in the nonfarm sector, they may be accompanied by changes in nominal wage rates, but the effect is likely to be small. If the economy is open, then changes in the volume of traded goods provide another adjustment mechanism, which would dampen any pressure on domestic factor prices. A reduction in the Thai export duty, which would raise domestic rice prices, might induce a long-run wage decline of casual workers of 1 percent (Amranand and Grais, 1984), whereas various schemes to raise the food subsidy in India were shown to have little effect on the real wage rate (chapter 22). It seems probable that changes in real wages would occur in the short run, with some nominal wages reacting only after a lag. The actual effects of changes in wage rates themselves due to a change in food subsidies are likely to be swamped by the real income effects.

International Prices

The Costa Rican ministry (in the excerpt opening this chapter) wanted to demonstrate that, despite price rises, its internal prices were still lower than those of its neighbors. Although this may have been politically astute, it conceals two important issues.[23] First, if the domestic prices are being held below their true international level, then producers are being penalized, and resources will shift away from those sectors. In addition, wide differences between domestic prices and those of neighbors, especially those with common land borders, invites smuggling and makes the operation of government procurement schemes more difficult. This can set an important constraint on food pricing policies in small countries with several neighbors. In effect, the food sector will operate as a small open economy regardless of domestic policies. Illegal border trade stimulated by the price differentials will ensure this.

A clear example of this problem arose in Tanzania, which has extensive common borders with numerous neighbors. The fixed price offered for maize by the state purchasing agency, the National Milling Corporation (NMC), drew widely varying response from year to year. In an effort to explain the volume of NMC purchases, a series of border prices of maize were constructed using a cif (cost, insurance, freight) import price and estimates of the parallel market exchange rate (Keeler et al., 1982). At times

23. It is also possible that the comparisons are largely meaningless, as the result of using an official rather than a true shadow rate for foreign exchange.

the border price was six times the NMC price. Over the eleven-year period, farmers rationally and predictably varied their offerings to the NMC, reducing their sales to the corporation when the price of maize in the border markets rose relative to the government's offer.

Concluding Comment

The Costa Rican ministry spelled out many of the significant issues and dilemmas facing food policymakers This chapter has reviewed each of these in turn, drawing on an extensive set of studies for illustrations and evidence. As further discussed in chapters 2 and 3, food subsidies are clearly an important and potentially powerful policy instrument to protect vulnerable groups in developing countries. If they are directed to the deserving, viewed as public investment in human capital, and financed by transfers from higher income groups, they need not have deleterious consequences either for foreign trade or macroeconomic management. In contrast, food subsidy schemes that substitute imports for domestic output, tax low-income producers through forced procurement, create deficits that can be financed only by inflation, displace other social programs, and disrupt the flow of essential imports will inevitably have undesirable and costly consequences.

5 Explicit versus Implicit Food Subsidies: Distribution of Costs

ALBERTO VALDÉS

For years economists have tried to go beyond the strictly economic "efficiency" measure of costs and benefits to resolve the problem of how to explicitly incorporate some of the noneconomic benefits and costs into their analytical framework.[1] One of the major issues is assigning weights to consumption gains accruing to different income groups, especially the consumption of food by the poor and malnourished. These noneconomic considerations are difficult to quantify, particularly when there is no consensus about the underlying noneconomic values.

Two alternative methods have been developed to bring distributive effects into the framework. The first is called the distributional weights approach, and the second is the basic needs approach. Most economists are completely disillusioned with the distributional weights approach; followed rigorously, it would lead to the acceptance of scandalously inefficient projects.[2] In contrast, there is some acceptance of the basic needs approach, which presumes that society is willing to absorb some of the cost of implementing policy interventions to provide for specific groups' minimum adequate consumption of food, health care, education, shelter, and water beyond the level resulting from market demand and supply.

Costs tend to be associated with fiscal outlays. But fiscal costs of a program are not necessarily equivalent to its economic costs; furthermore, particularly for food, fiscal expenditures are often avoided. Through price policy instruments, some segments of society make an implicit transfer of income to another segment of society. How much society pays and who pays for subsidized food under both explicit and implicit transfers is a central question.

This chapter examines the distribution of costs under both explicit and implicit food subsidies. Explicit subsidies are those where budgetary

1. The term *efficiency* is often given too narrow an interpretation. It refers to means, not ends, and also includes social valuation.

2. Harberger (1978, 1984) discusses both approaches.

outlays are made by the government, whereas implicit subsidies are those where supply prices (farmers' prices) are held down. The fiscal and economic costs and who pays them can be quite different for each of these approaches. In countries with explicit subsidies, there is a temptation for governments to try to reduce fiscal costs by transferring part of the cost to farmers. In time, the explicit subsidy scheme is often accompanied by implicit subsidies to consumers at the cost of the farm sector (chapter 6). Hence, in evaluating a real-life situation, the distinction between explicit and implicit subsidies is not always clear.

There are three major issues in assessing the cost of food subsidies. First, the benefits and costs of a policy can be defined by the effect of the policy on some fundamental objectives of the economy. Analytically, costs are the benefits forgone by not using the same resources in other ways. By measuring the costs and benefits with the same yardstick, the net effect of policy on the chosen objective can be measured. Perhaps the most difficult task in assessing the relative merits of various approaches to satisfy basic needs is to identify and quantify the costs and the benefits of the interventions in question. Most interventions have more than one objective, and the relative weights of these objectives could change through time. This is especially the case with food subsidies. In a broad sense, a food subsidy is an instrument to provide a social safety net and to enhance political stability.

One basis for a food price policy rests on the argument that food is a merit good, since it has obvious benefits in the form of better nutrition for people who would otherwise be in poor health. But other bases for determining agricultural prices may serve as guidelines for intervention in domestic food markets. Five possible objectives of food subsidies are (1) reducing malnutrition among low-income groups; (2) achieving food security (i.e., reducing instability in food consumption, particularly for some targeted segment of the population); (3) redistributing income in urban areas; (4) lowering food prices, thus enabling wages to be low relative to the price of industrial goods as well as relieving the fiscal burden of public sector employment; and (5) reducing domestic price inflation (however, as discussed in chapter 4, if the cost of subsidies contributes to the budget deficit, inflation may actually increase).

A second critical problem is how the subsidy is financed. If the scheme is an explicit subsidy, an estimate of its direct costs may be obtained by measuring the fiscal outlay of the scheme, as well as the indirect economic cost to the economy of financing such a program. A third issue relates to the distinction between short- and long-run effects. Long-run consequences for specific income groups could be quite different, and some short-run benefits could be eroded.

Trade-offs Between Growth and Food Subsidies

Explicit subsidies for poverty alleviation can be classified under two types of policies (Selowsky, 1979a). In one, investment policies aim at increasing the endowment of human and physical capital of the poor by increasing their earning capacity, and as such they do not necessarily imply a trade-off between distribution and economic growth. The second type of policy is that of basic needs—the provision of certain goods and services at subsidized prices to achieve a minimum level of consumption, with limited effects on labor productivity.

Some programs, such as nutrition and health intervention programs aimed at children, could fall into both categories. They represent a basic need, but they can also increase the long-term productive capacity of the poor. In fact, such an approach has been taken in evaluations of target-oriented food subsidies, such as the one done by Torche (1985) of the Chilean supplementary feeding program for children and pregnant women. According to this study, the intervention yielded an estimated long-run real social rate of return considerably above the 17 percent estimated by the Planning Commission (ODEPLAN) as the social opportunity cost of capital for public investment in Chile.[3] Hence, investment in the poor enhanced growth because it yielded a social rate of return higher than the opportunity cost of capital. Because of prevailing inadequacies in the capital market, a market solution would have been clearly inefficient, because families underinvest in those forms of capital formation—thus the need for public intervention. The implication is that correcting such underinvestment with government outlays does not necessarily introduce a trade-off between growth and basic needs; on the contrary, it has a positive effect on both. See the appendix to this chapter for a more detailed presentation of the study by Torche.

The second type of government intervention, associated with the basic needs approach, provides specific goods and services required to achieve a minimum level of consumption. Some trade-off between growth and equity will arise from the basic needs intervention, to the extent that these subsidies have a more limited effect on the lifetime productivity of the poor.

The cost of intervention depends on the type of program implemented. In analyzing the costs of these programs, it is useful to distinguish between three levels of analysis: household, sectoral, and macroeconomic. At the household level, given a basic needs objective, costs will vary considerably among different types of intervention. The difference in costs de-

3. A description of the approach developed for such an evaluation and highlights of the results are presented in the appendix to this chapter

pends on the incidence of administrative costs and, perhaps more important, on the real amount of leakages.

The issue of leakages is fundamental. Public funds are misdirected when they are captured by people who do not deserve the income transfer because their income is already high. But there are other kinds of leakages. The income transfer implicit in a food subsidy helps pay for a fraction of a family's food expenditures, but it also releases part of the purchasing power of the family for spending on nonfood items. In other words, in the same way as ordinary income, some of this extra income may be spent on other basic needs such as health or housing and some may in fact be spent on items that are not so basic.

A rather dramatic illustration of these leakages was documented by Gavan and Chandrasekera (1979) for Sri Lanka. They found that a rice ration of one pound led to a net increase of rice consumption of six-tenths of a pound, but adjusting for substitution of other cereals and noncereals meant that the increase in consumption of all foods was only a little over a tenth of a pound (expressed in rice equivalents). This is one illustration of leakages across commodities. A second major source of leakage results when (in absolute terms) upper- and middle-income consumers capture a large share of benefits of the food subsidy, as illustrated by Calegar and Schuh for wheat subsidies in Brazil (chapter 19). Even if the subsidy benefits low-income families relatively more as a percentage of family income, such a leakage raises significantly the cost of food subsidies intended for the poorest families. The third source of leakage, the reallocation of food intended for children and pregnant women to other family members, is characteristic of supplementary feeding programs. Leakages are extremely hard to avoid, although, as discussed in chapter 2, several approaches are available for their reduction.

A second level of analysis—the sectoral level—is specific to the particular agricultural product used as the vehicle for the subsidy. Using a simple partial-equilibrium framework, it is quite straightforward to estimate the direct effects of food subsidies on income transfers, fiscal outlays, production, consumption, and trade. This type of analysis is useful as an illustration of the direct partial-equilibrium effect on the specific commodity market in question, but if the scheme demands substantial fiscal outlays or affects product or factor markets throughout the economy, the general equilibrium implications need to be examined.

A relatively new and relevant concept here is the social demand curve, which is a crucial element of the basic needs approach. This curve lies above the market demand curve by the amount of the social externality attached to each successive unit of food consumption. The externality is defined as the price society is willing to pay for each successive rise in the nutritional level of the group of individuals (children, for example). The

basic needs externality need not be linked to the consumption of a particular food product. Instead, it could reflect a particular outcome in terms of nutrition.[4] Quantifying the basic needs externalities is an extremely complex task, and it is just being tested in empirical evaluations. An important implication of such an approach is that only a fraction of the income transfer that is spent on the consumption of specific goods and services (basic needs) by the target population is considered a benefit.

At the macroeconomic level, various approaches have been used to evaluate the implications of explicit food subsidies. The macroeconomic variables include effects on the government's budget, on inflation, on the balance of payments, and ultimately, on overall economic growth. There is also an important reverse linkage, observed by Scobie (1981) in Egypt, in which the policies for agriculture and the level of food subsidies are themselves influenced by the macroeconomic setting. General equilibrium studies on Egypt have been reviewed by von Braun and de Haen (1983), and the macroeconomic and trade implications for Egypt are discussed by Scobie in chapter 4.

Aggressive income distribution policies such as food subsidies can survive and coexist with growth-efficient policies if the fiscal and overall economic costs are acceptable. The cost varies from country to country and so does what is acceptable at a given point in time. Empirical evaluations of the macroeconomic implications of general food subsidies using a general equilibrium framework have not arrived at a general conclusion applicable to countries other than those analyzed. The tools of analysis could be similar, but the accompanying government policies and the particular macroeconomic setting are often quite different.

A useful case study of the macroeconomic cost of achieving a basic needs level of caloric consumption was done for Latin America by the Economic Commission for Latin America (ECLA) in collaboration with the World Bank. To get an idea of the size of the problem, the aggregate deficit in basic needs—in other words, the poverty gap—was estimated first in terms of absolute poverty, that is, the extent to which incomes per capita fell below the poverty line for the population below that line. For Latin America in 1970, this average gap was estimated to be U.S. $70 per capita (in 1970 prices), which represented approximately 5 percent of GDP, equivalent to approximately 22 percent of the total government budget for the region (Molina, 1980). At the country level, these values ranged from 15 percent of GDP for Honduras; to 5 to 12 percent for Colombia, Brazil, and Peru; to 1 to 5 percent for Chile and Mexico; and to less than 1 percent for Argentina.

4. An illustration of this analysis, developed by Harberger and applied to the basic food needs, is presented in Scandizzo and Knudsen, 1980.

At the same time, the value of the food needed to eliminate the calorie deficit as a percent of GDP (under alternative estimates of income distribution profiles) was computed for each country. This estimate accepts as given the leakages resulting from consumer preferences. It was estimated the countries with income per capita between U.S. $600 and $800 would require approximately 1.5 to 2 percent of GDP to cover this calorie deficit. (As a reference, most countries in Latin America spend between 1 and 1.5 percent of GNP on health programs.) The type of instrument selected becomes a key consideration in the cost. A general food subsidy is likely to be inefficient in Latin America, because the target group is a small proportion of the total population.

What are the magnitudes of the trade-offs between growth and food subsidies? An increase in government outlays has to be financed by government revenues or by reallocation of public expenditures. This can be done by raising income, sales, or property taxes; by eliminating certain tax exemptions; by eliminating or reallocating other subsidies; and by reducing defense expenditures. Measures having a regressive effect, such as increasing sales taxes, would hurt the poor and thus run counter to the efforts to reduce poverty through food subsidies.

Many developing countries are currently instituting tax reforms, and most analyses conclude that, in Latin America, there is room for raising additional fiscal revenues by increasing the tax base and increasing direct taxation at the top of the income distribution. As part of the ECLA study for Latin America, Selowsky (1980) has estimated what he calls the "worst" scenario, in which the additional expenditures (5 percent of GNP for a package of basic needs) are financed entirely by an additional income tax (12.5 percent) levied on the income of the richest 10 percent of the population (accounting for 4.5 percent of GNP). Part of the tax comes from savings in this income group. Under two alternative capital market scenarios, Selowsky estimates that the decline in the country's investment rate would be approximately 2.5 percent. If the social return of capital is 20 percent, the decline in the growth rate will be one-half of 1 percent. Thus at most, for Latin America "the 5 percent transfer of GNP toward basic needs consumption results in a half a percent lower GNP growth" (Selowsky, 1979a). This is for food, health, education, and housing. The cost of the grain that equals the estimated calorie deficit varies between 1 and 2 percent of Latin America's GNP (countries with income per capita between U.S. $600 and $800 in 1970), and the estimated aggregate calorie deficit is equivalent to 2.9 percent of the region's total consumption of cereals. These estimates ignore any positive effect of improved human resources on economic growth and thus overestimate the negative effects on GNP.

Thus the cost of alleviating the health-nutritional deficit can be ex-

pressed in terms of a reduction in the growth rate of output. For middle-income countries, as in Latin America, this option seems clearly feasible, particularly if food subsidy programs can be designed so that their effect is different from that of an equivalent income transfer. In countries with lower per capita income, the cost of reducing or eliminating the calorie gap will be higher. This is so because the initial calorie deficit is relatively higher, income per capita is lower, and the cost of administration is higher if coverage is extended to the rural population (a target group that represents a higher fraction in poorer countries).

Government Outlays for Food Subsidies and Their Distributional Effects

The budget outlays for food subsidies relative to total government expenditures have been substantial for several countries (table 5.1). These costs can be met by tax revenues, foreign aid and concessional loans, external borrowing, and deficit spending. There are two caveats. First, calculation of the budgetary subsidy costs is not straightforward, for example, in ascribing a value to food aid-related imports.

Second, if food subsidies increase the budget deficit and induce inflation, they may erode the ability of low-income groups to acquire the nonsubsidized goods and services they need (chapter 4). Some food becomes cheaper, but health service and housing become relatively more costly; thus the net contribution of the food subsidy could be reduced significantly. A higher rate of inflation may lead the government to impose controls on procurement farm prices, increasing the implicit tax on agriculture.

The sometimes rapid rise in government expenditures on food subsidies has been met, in part, by money creation, which could also induce inflation (chapter 4). Researchers have been quite successful in measuring the income transfer (in nominal terms) resulting from food subsidies in several countries. There is, however, a complication. To the extent that food subsidies have been used to achieve broad social objectives, of which nutritional improvement is one but often not a principal one, figures on total costs of food subsidies clearly overestimate the cost of achieving the observed health and nutritional improvements. Assigning the actual costs and identifying the full range of benefits (particularly the nutritional implications) of food subsidies is quite arbitrary. Thus whereas a rough estimate of the costs of a scheme might be produced, the effectiveness of the scheme cannot be assessed, partly because any assessment is likely to be based on insufficient data and partly because a clear statement of its principal objectives is lacking. Thus its effectiveness cannot be compared with alternate approaches for meeting the specific objectives.

The ambiguity of defining nutritional goals is less of a problem in pro-

TABLE 5.1 Government outlays on explicit food subsidies, selected countries (percent)

Country	Period	Population Reached by Subsidy	Products Subsidized	Government Outlays as Percent of: Gross Domestic Product	Total Government Expenditures	Public Investment
Bangladesh	1977-80	Main urban	Rice		3-9[a]	
Bangladesh	1972/73	Urban	Rice		8-11[a]	
Brazil	Since 1972		Wheat		21-36[b]	
Egypt	1975-81	Urban and rural	Wheat, rice, maize[d]	8.1	25	
Egypt	1973 to early 1980s	Urban and rural	Same		7-15	9
India	1978/79	Mainly urban	Wheat and rice	0.6	4	
Mexico	Early 1980s	Mainly urban	Corn tortillas	5-1.4		
Pakistan	1973/74	Mainly urban	Wheat, vegetable oil, sugar		19 + 6[c]	
Pakistan	Early 1980s	Mainly urban			15 + 3[c]	
Sri Lanka	Before 1977	Urban and rural	Rice	5.0	15	
Sri Lanka	Since 1977			2.0	5	
Zambia	1970s	Mainly urban (including mining towns)	Maize			10

SOURCES: Bangladesh, chapter 15 and R. Ahmed, 1979; Brazil, chapter 19; Egypt, chapters 4 and 12; India and Mexico, chapter 20; Pakistan, chapter 17; Sri Lanka, chapter 18; and Zambia, chapter 21.

[a]Including food aid.
[b]Excluding food aid.
[c]As percent of government revenue.
[d]Wheat and wheat flour account for half of total subsidies.
[e]Federal plus provincial expenditures.

grams with explicit health and nutrition interventions, such as supplementary feeding programs. Although not necessarily an alternative to food subsidies, such programs traditionally have been the most popular form of intervention for correcting undernutrition (Underwood, 1983). Measuring the effect of these programs on the health and nutritional status of the target population is difficult but easier than for subsidies because nutrition and health improvement are the only effects that have to be judged.

Cheap Fiscal Subsidies: The Case of Implicit Food Subsidies

Implicit subsidies imply that a low food price is obtained at no fiscal cost to the government. Although policy statements usually make reference to the need for reasonable consumer prices, agricultural production is the overt focus of agricultural policy in most developing countries. Other broader objectives are also sought, such as contributing to overall economic growth or supplying (and saving) foreign exchange. In contrast, in industrial countries the focus of agricultural policy is usually on farmers' income. Nevertheless, agricultural policy will most decidedly affect the nutrition of the poor. The link between agricultural price policy and nutrition is indirect. While most governments receive political support for their efforts in reducing malnutrition, dealing with the nutritional problem through price manipulation is an extremely complex task. For example, efforts to stimulate agricultural production through economic incentives without increasing the fiscal burden can collide with the desire to reduce the price of food to urban consumers.

Cheap food policies have been pursued in many developing countries. Under implicit food subsidies, policies have attempted to reduce the price of foodstuffs while minimizing fiscal cost (or increasing government revenues through export taxes). Lower prices to consumers have been achieved by reducing incentives to domestic producers, even when some supplies were imported. Food prices were kept low through a combination of exchange rate policies, price controls, and quantitative restrictions on trade. It is increasingly recognized that in developing countries the most severe long-term taxation of the agricultural sector is implicit taxation, in which the relative price of tradable agricultural products (exports and imports) is kept low relative to the price of nontradables and to imports in the nonagricultural sector by means of overvalued exchange rates.

Overvaluation of the domestic currency serves as an implicit (import) subsidy to consumers and an implicit tax on producers, because it causes domestic prices to be lower than what they would be without overvaluation. In the long run, the main consequence of real exchange rate overvaluation will be movement of resources, especially labor, savings, and entrepreneurial capacity, toward the nontraded and import-competing sectors in

the nonagricultural economy. Industry is usually protected by trade barriers, resulting in rates of protection that are much higher than those affecting agriculture. Discriminatory protection has generally worked against tradable agricultural foods (such as cereals) not only because varying tariffs favor industrial goods, thus raising the cost of inputs for agriculture, but also, perhaps more importantly, because it tends to overvalue domestic currency compared to a more neutral trade regime. This penalty against import-competing and exportable goods is inherent and will last as long as industry is highly protected. Even a promising development such as the discovery of petroleum resources can have a strongly adverse effect on incentives for agriculture, as can a heavy influx of capital. Hence, the macroeconomic management of the economy could well dominate the economic environment for agriculture. Furthermore, to the extent that agricultural nontradables such as potatoes, yams, and white maize are close substitutes in consumption with partially imported food, in the long run their prices will not diverge much from those of tradables, and hence similar conclusions could apply to them.

As with any trade intervention, implicit food subsidies are likely to affect production, consumption, and trade. The welfare cost of such policies can be separated into the effect on production, mainly through its effect on the national output mix, and the effect on consumption, through distorted prices. The main consumption cost of such policies arises because they induce an artificially rapid adjustment toward a narrower diet, heavily concentrated on cheap foods, which often are partly imported. A case in point is that of wheat in tropical areas, but the effect applies to a much broader set of circumstances. In Brazil, the relatively low prices for wheat stimulated its consumption (chapter 19). As a consequence, traditional foods such as maize flour, cassava flour, and beans have gradually been displaced from the diet. As a side effect, low-income farmers who grow crops such as rice, beans, maize, and cassava suffer economic discrimination as a consequence of the wheat subsidies.

A predictable and well-documented result of cheap food policies is that self-sufficiency in the commodities in question, that is, those that are implicitly subsidized, decreases rapidly. As a consequence of the increased consumption of relatively cheap imports and lower domestic production, import dependence rises. This has also occurred with explicit subsidies, where price and income effects resulted in higher aggregate consumption. Wheat consumption in Brazil and Egypt are two examples.

Alternatively, if governments pursue a more open trade and exchange rate regime, prices of tradable foods will be higher than they are under implicit subsidies. This would provide an economic environment more conducive to investment in agriculture and would probably lead to an expansion in production. But in the short run, elimination of implicit taxa-

tion of agriculture would result in reductions in urban and rural real wages relative to food prices. This is the case with sudden devaluations. Although devaluations may be necessary to correct trade imbalances, in the short run they can be very harmful to the urban poor and rural landless. These short-term effects are quite predictable, and the study by Trairatvorakul (1984) on the rice export tax in Thailand is an important contribution in this field. In an analysis focusing on income distribution, it is crucial to distinguish among the various income groups in the urban and rural sectors. Trairatvorakul concludes that the short-run effect of rice price increases on Thailand's overall income distribution is minimal. However, among the various population groups, some are more vulnerable, including net deficit paddy farmers, small farmers of other crops, and farm workers. Such analysis is helpful in identifying the socioeconomic groups that need to be compensated.

The real challenge is determining the dynamic economic forces that affect growth and income distribution in the medium and long terms, including both direct and indirect implications of implicit subsidies. Research on long-term effects has been surprisingly inadequate, and hence there is not much to report from empirical evaluations. Both the Kaldorian and the relative price adjustment general equilibrium models fail to capture effects on permanent lifetime income. However, many of the factors determining the distribution of income are long run in nature (Dervis, de Melo, and Robinson, 1982). Static measures of income distribution effects fail to capture rural to urban migration, food-wage links, or asset creation (both physical and human), all of which are likely to be affected by the food price structure. There are undoubtedly great difficulties in modeling long-run cumulative processes, and the tools available are far from adequate for addressing empirically the personal income distribution implications of a major food price policy change. There are, however, some promising efforts toward correcting this inadequacy, such as the work by Cavallo and Mundlak (1982) for South America and that of Binswanger and Quizon for India (chapter 22).

There have been several attempts to estimate general equilibrium implications of changes in agricultural price policies (Binswanger and Quizon, chapter 22), for India; Dethier, 1985, for Egypt; Amranand and Grais, 1984, for Thailand; Reardon, 1982, for Peru; and Braverman, Ahn and Hammer, 1983, for Korea). Innovative and useful as they are, these studies do not really address the issue of interactions between agriculture and the rest of the economy with a long-term perspective. Investment is not endogenized, and practically all these studies treat urban wages as exogenous variables. Even in those in which a market-clearing relation in the urban labor market is included, it is modeled with respect to fixed nominal wages in the urban sector. Thus long-run empirical determinations of the

winners and losers from agricultural price policy reform in developing countries are still greatly constrained by the data available.

There are several other considerations that are particularly relevant to the theme of implicit food subsidies. One is that the implicit taxation of agriculture is not specific to food production activities. It applies to most tradables in agriculture—both import-competing and export products. However, this general implicit taxation is sometimes accompanied by direct price and marketing controls on food products that are import competing in most cases. The net effect on food markets is the sum of both effects.

Another is that the medium- and long-term effects of changes in food prices on nominal and real wages and employment is a crucial link in the analysis of income distribution effects. First, labor markets need to be examined at the national level instead of within a single sector, allowing for rural to urban migration, which is probably responsive to food price changes. Second, labor is usually a segmented market in which there are formal, protected labor markets (government and industry) whose nominal wages tend to be inflexible downward, and informal labor markets that compete with migrating landless laborers. Nominal wage rates in the informal labor market are probably linked quite directly with agricultural pricing policy. Implicit subsidies may lead to increased migration and nominal lower wages in the informal urban labor market, offsetting some of the gains from lower food prices. There is little evidence on whether real wages in the urban protected labor market adjust fully to changes in food prices. If the price reduction is a substitute for wage increases, then the real wage is unchanged, with gains to private employers and the government. A strong hypothesis is that private costs to the rural sector and benefits to the urban sector (from the viewpoint of urban and rural income distribution) will diminish over time, while the social costs of the implicit subsidies will tend to increase.

Finally, concerning the output effect on agriculture of implicit subsidies, there are numerous studies of the response of individual products to price changes, but there is still a lively debate on the degree of aggregate supply response in agriculture. It must be stressed, however, that the analysis of the effects on output of implicit taxation of agriculture has inappropriately focused on issues of elasticities rather than on intersectoral flows of labor and capital over time and on changes in the output mix.

The long-term implications have been emphasized here. However, considering the time horizons and constraints under which policymakers and politicians operate, the short-run output and distribution effects are far more likely to dominate the policy process in the politically sensitive food sector.

Appendix: Measuring the Effects of Supplementary Feeding Programs on Raising the Productive Capacity of the Poor

Very few empirical ex post evaluations of the social costs and benefits of targeted health and nutrition intervention programs in developing countries are available to test the effect of these programs in order to compare them with other possible interventions.

One such evaluation, which essentially uses a human capital approach, is the cost-benefit evaluation of Chile's national health and nutrition program for pregnant women and preschool children (Torche, 1981). The principal objective of this program, called the Programa Nacional de Alimentacion Complementaria (PNAC), is to improve the health of pregnant women and children under six years of age. The program covers about 80 percent of the target population and has been in existence for approximately twenty years. It provides free milk and milk substitutes to households; promotes periodic examinations of mothers and their children in local health clinics (a condition for obtaining the free milk); and monitors mothers and children who are at nutritional risk, channeling them to specialized programs for recuperation. Although any family in the country can participate in the PNAC program, the primary focus is on the poorest, the fourth and fifth quintiles, of the population.

The benefits of the PNAC program as defined by Torche were measured in terms of (1) changes in birth weight; (2) morbidity and infant mortality; (3) the child's predicted school performance and resulting effect on lifetime earnings; and (4) the parents' productivity as a result of less time spent on child care.

Using a survey taken in 1979/80 of a random sample of 1,600 households and the actual cost estimates from the program's accounts, Torche measured the net present value of the social costs and benefits of PNAC relative to a control group. The sample group was representative of Chile's total population of households with children under six years of age, and the control group had the same characteristics as the sample population in every aspect except that they did not participate in PNAC. Various statistical tests were used to examine the homogeneity of the control group.

An interesting feature of the evaluation of the Chilean program is that, in contrast to the more typical welfare programs essentially concerned with short-term health improvement, the analyst directly addressed the question of whether such a program had effects on lifetime earnings and as such should be treated as an investment in human capital. If socially profitable, then the equity-growth trade-off is not an issue, and thus the arguments for support of such programs are even stronger.

A critical question is, of course, how benefits and costs are quantified in such an evaluation. The analysis of birth weight showed that, other

TABLE A5.1 Costs and benefits of Chile's PNAC, average per beneficiary (U.S. dollars)

Income Group	Present Value of Costs[a]		Present Value of Benefits[b]					
	Food and Health Control	Food Distribution	Birthweight	School Performance		Range	Net Benefits	
				H_1	H_2		H_1	H_2
Fourth quintile[d]	104	7.7	95.1	88.1	151.0	183–246	71	134
Fifth quintile[e]	100	7.7	33.0	85.8	141.8	119–75	11	67

NOTE: Pesos were converted to U.S.$ at the official exchange rate of June 1979.

[a]Approximately 8.5 percent of total government expenditures on health in Chile in 1979 were for PNAC.

[b]Based on lifetime income profile.

[c]Expressed at birth, given a probability of survival of 0.9075. H_1 and H_2 represent different assumptions concerning the interactions among schooling, skills, and experience in determining lifetime income.

[d]170 thousand children.

[e]300 thousand children.

things being equal, the percentage of children born with below-normal weight (2.6 kilos) was significantly lower for fourth- and fifth-quintile families participating in the PNAC program. Thus the benefit was measured as the saving in medical services associated with the recuperation of children born with subnormal weight.

Costs and benefits from improved performance at school were measured by the net resource savings to the public school system due to the reduction of the number of years spent repeating the same grade and to the reduction of the dropout rate. There is an additional cost—more schooling services are needed to keep these children for additional years and for the forgone market income of the teenager while he or she stays in high school. There is a benefit from the present value of the differential lifetime earnings after finishing school. Statistical analysis was applied comparing school performance of children from families with and without PNAC, adjusting for other possible determinants, such as schooling of the parents.

The results of the survey showed no difference in morbidity among those participating and those not. The effect on infant mortality was captured by measuring the benefits from performance at school, which were adjusted for the probability of survival at different ages of the sample population for both participating and nonparticipating families.

Time and other savings for the parents were dropped as an explanatory variable, because the observed differential on morbidity was not statistically significant for PNAC and non-PNAC families.

Cost estimates included the social value of the products distributed and the social marginal cost of health services provided in connection with PNAC. In expressing costs and benefits in terms of their present value, a social annual discount rate of 17 percent was used; this rate was suggested by the Chilean National Planning Commission for the evaluation of public investment projects at that time.

Table A5.1 shows that the net present value at a discount rate of 17 percent is positive for both quintiles.[5] In other words, the long-run social rate of return of PNAC, in real terms, is substantially higher than 17 percent. Hence such investment in supplementary feeding and health for the poor not only helped in providing a basic need—improved health and nutrition for preschool children and mothers—but it also contributed to increasing the long-term productive capacity of the poor.

5. In absolute terms, for a total of approximately 470,000 children as beneficiaries, the net present value of benefits of PNAC were estimated to range between U.S. $15.4 and 42.8 million.

6 Implications of Consumer-Oriented Food Subsidies for Domestic Agriculture

JOACHIM VON BRAUN

An issue of major concern to policymakers is the potential negative effects of consumer-oriented food subsidies on the agricultural sector. This chapter does not attempt to provide a balanced assessment of the costs and benefits of food subsidy systems. Rather, it focuses on answering three questions:

1. What are the mechanisms through which consumer-oriented food subsidies affect domestic agriculture?
2. To what extent do consumer-oriented food subsidies burden domestic agriculture? That is, what is the empirical evidence?
3. How may the potentially negative effects of consumer-oriented food subsidies on domestic agriculture be avoided?

Mechanisms through Which Food Subsidies Affect Agriculture

An appropriate point of reference is needed for an evaluation of food subsidies. Theoretically, one would like to define a without-food-subsidy situation for that purpose. However, this is not straightforward. In order to assess the costs and benefits of subsidies, the appropriate point of reference is not the theoretically optimal policy but the most probable actual policies that would be implemented in the absence of food subsidies. For instance, in reality the open economy is not necessarily the appropriate point of reference for an evaluation of the marginal distortions caused by consumer-oriented subsidies. General theoretical reasoning does not lead to obvious conclusions about the implications of food subsidies for domestic agriculture. Too much depends on the actual policy design and responses of economic-political systems to changes in external and internal economic environments. Therefore, the following synthesis of country experiences is based on the empirical evidence of relations between food subsidies and agriculture.

Large food subsidy schemes may affect agriculture through price effects and effects on public expenditures for the agricultural sector, induced directly or indirectly by food subsidies. Both may have an effect on agricultural production, farm incomes, and income distribution within the farm sector.

Concerning price effects, one widely held hypothesis is that supplies imported for subsidized distribution in domestic markets tend to depress producer prices of the same or competing commodities. This price depression creates disincentives to production, reallocation of resources, and reduced farm incomes. It can also be argued that, in situations with dual markets, the real income transfers to consumers result in increased demand for commodities on the open market, from which the farm sector could gain.

This effect is influenced by the design of the system and the degree of targeting of procurement and distribution. If food subsidies favor poor consumers, the resulting increase in food demand will put upward pressure on food prices in the open market. Surplus producers might gain, but rural net purchasers—frequently not included in subsidy systems—might lose. Government procurement schemes are usually not uniformly aimed at all producers. George argues, for example, that, because small farmers in India were exempted from levies imposed in the procurement system, they might gain from the procurement with food ration policy (chapter 16). In general, a forced procurement scheme may have very different implications for the distribution of benefits from subsidies than, for instance, taxing all groups via an excise tax to finance the subsidies. Binswanger and Quizon conclude that, in India, taxing the rural rich by, say, forced procurement, reduces aggregate food demand by more than taxing all groups via an excise tax (chapter 22). Therefore, the poor target groups benefit more from the forced procurement scheme than from an excise-tax-financed scheme.

Another line of reasoning focuses on the direct fiscal implications of food subsidies and their indirect effects on public spending on agriculture. Increased government outlays for explicit food subsidies may induce relative or absolute reductions in the agricultural budget and thus have a negative effect on agricultural development. To the extent that public investments in agriculture and rural infrastructure are connected to food subsidies, the effect on sectoral growth and employment would be detrimental. In Egypt, public investment for agriculture in absolute terms was not shrinking as subsidies grew. But it appears that public investment in agriculture as a percentage of total public expenditures was significantly reduced as food subsidies' share of the government's budget expanded (von Braun and de Haen, 1983). The controversial negative employment effects of such fiscal linkages are likely to be small. It is more likely that the

segments of the agricultural sector that operate with hired labor might gain from the effect on employment of low food prices and thus low wages.

A further justification for taking a close look at the implications of food subsidies for domestic agriculture springs from the necessity of understanding the policy process in which food subsidy schemes evolve. Analysis of a number of countries' programs reveals that food subsidies do not result from a single decision. Rather, they tend to develop out of an institutionalized food and agricultural policy. This means that food subsidies may influence agriculture and agriculture may influence subsidies. The question is one of interaction, not a one-way causal effect. The question of which agricultural policies tend to lead toward large-scale food subsidy schemes is relevant for many countries that are currently not concerned with the problems of how to cope with food subsidies but that could be in the near future.

Extent of Rural Orientation of Explicit Food Subsidies

The eight countries included in the following evaluation comprise three low-income economies (Sri Lanka, Bangladesh, and Pakistan), three lower-middle-income economies (Thailand, Egypt, and Zambia), and two upper middle-income economies (Brazil and Mexico; World Bank, 1984e, classification). They are grouped accordingly in table 6.1. The sample reveals that

1. Annual per capita income in 1980 ranged from U.S. $140 in Bangladesh to U.S. $2,250 in Mexico.
2. The labor force in agriculture ranged from 30 percent of the population in Brazil to 76 percent in Thailand.
3. Growth of agricultural production during 1970–81 ranged from 1.8 percent in Zambia to 5.2 percent in Brazil.
4. Self-sufficiency in basic food was as low as 63 percent in Egypt and as high as 138 percent in Thailand.

At first glance, it seems the only feature these eight countries have in common is that they each operate a consumer-oriented food subsidy system. In terms of fiscal costs, Egypt operates the biggest scheme, which absorbed 13 percent of the total government budget, followed by Sri Lanka (12 percent; see table 6.2). Thailand operates an implicit subsidy, which is achieved via regulation of rice exports. The Thai case is relevant here because the export restriction (tax) seems to be motivated much more by consumer-oriented subsidy objectives than by fiscal objectives. Thus the system design differs from those of some of the other countries that have explicit price subsidies simply by the source of financing.

TABLE 6.1 Economic indicators, selected countries with consumer-oriented food subsidies

Countries	GNP Per Capita (1980 U.S.$)	Labor Force in Agriculture (percent)	Agricultural Growth 1970–81 (percent per year)	Self-Sufficiency in Basic Food (percent)
Sri Lanka	300	54	3.0	85
Bangladesh	140	74	2.4	92
Pakistan	350	57	2.6	97
Thailand	770	76	4.5	138
Egypt	650	50	2.9	63
Zambia	600	67	1.8	89
Brazil	2,220	30	5.2	100
Mexico	2,250	36	3.4	81

SOURCES: World Bank (1984c); self-sufficiency in basic food was calculated from per capita calorie consumption and net imports of foodgrains and cooking oil in calories (Food and Agriculture Organization, various years; Food and Agriculture Organization, 1977).

The share of the rural versus urban population in the subsidy schemes as indicated in table 6.2 was measured in various ways:

SRI LANKA. In 1978–79 food subsidies represented 1.9 percent of the income in urban households but 4.8 percent in rural ones (chapter 18).

BANGLADESH. In 1973–74 the rural population (90.8 percent of the total population) received about 45 percent of the total ration of foodgrains (R. Ahmed, 1979). The gap seems to have closed somewhat in recent years due to expanded food-for-work programs.

PAKISTAN. The mean income increment in 1976–77 due to consumption of rationed wheat and sugar in urban and rural households below median expenditures was 7.4 percent in the urban sector and 1.0 percent of income in the rural sector (Rogers, 1978).

THAILAND. An increase in the rice price (a reduction of the implicit subsidy for consumers) would increase poverty in urban areas and change the poverty structure in rural areas (between rice and other farmers) but would not greatly affect rural poverty in total (Trairatvorakul, 1984).

EGYPT. Forty-three percent of all direct food subsidies are received by rural households that represent about 55 percent of the population (Alderman and von Braun, 1984). Food subsidies correspond to a higher share of total expenditures in rural households than in urban ones.

ZAMBIA. Evaluation of purchasing and expenditure patterns reveals that the main beneficiaries of the maize subsidy are urban consumers and, to a limited extent, small farmers who are net purchasers of maize (chapter 21).

TABLE 6.2 Importance of explicit food subsidies and outreach to the rural population, selected countries

Country	Explicit Consumer Food Subsidies as a Share of Government Budget (percent)[a]	Share of Subsidies to Rural Population
Sri Lanka	12	High
Bangladesh	10	Low
Pakistan	7	Low
Thailand	—	Medium
Egypt	13	High
Zambia	6	Low
Brazil	5	Low
Mexico	2	Low

[a]The share of food subsidies in the total government budget (current and investment expenditures) comprises subsidies for all food commodities if not stated otherwise.

BRAZIL. The consumption patterns of wheat products suggest that only a minor share of the consumer subsidy for wheat is captured by the rural population. The major share goes to the middle- and high-income urban populations (Williamson-Gray, 1982).

MEXICO. The subsidy on maize products (tortillas) favors the urban poor population, whereas the price support favors the farmers producing a marketable surplus. Small farmers and rural laborers are neglected (chapter 20).

Bangladesh and Egypt receive particularly high amounts of food aid, which is a source of financing the food subsidy. Ahmed (chapter 15) reports that, taking the income transfer from food aid donors into account for Bangladesh, food subsidies use only 3.5 percent of the budget rather than the official figure of 10 percent given in table 6.2.

Burden on the Agricultural Population

Subsidy systems differ widely in their coverage of rural households. The rural-urban differences are discussed in chapter 2; the focus here is on farmers as a segment of the rural population. In Sri Lanka and Egypt, the farm population benefited at least as much from the subsidies as the rest of the population, but the farm population is not targeted in the subsidy systems of other countries (table 6.2). There does not appear to be a clear-cut relation between a country's income level and the degree of participation of the farm population in its consumer-oriented food subsidy system. Similarly, the orientation of systems toward the urban population does not appear to be particularly influenced by the importance of the nonfarm sec-

tor, nor does the degree of food self-sufficiency seem to be related to a particular system design.

Political and economic forces in each country shape the design of its consumer-oriented subsidy system. Clearly, however, exclusion of the agricultural population is not a uniform feature of consumer-oriented food subsidy schemes. Being included in subsidy schemes, however, does not necessarily mean that farm households actually acquire net gains from such a system. Because farm households are both producers and consumers of food, the income gains from access to subsidized food may be offset by the depression of producer prices, which may be partly induced by the subsidy. Loss and gain patterns vary greatly depending on farm size, household consumption, and farm production characteristics. They are a direct reflection of the net effects of consumer-oriented food subsidy policies in combination with the producer price policies accompanying them.

A common pattern of price distortion in low-income countries is characterized by explicit or implicit subsidization of basic staples for consumers, accompanied by implicit taxation on producers of both these and export crops and by implicit subsidies for producers of animal products. Obviously, this pattern benefits some but burdens others. It may have a favorable effect on income distribution, as aggregation of these gains and losses reveals for Egypt. Small farmers and landless laborers, for instance, gain more in absolute terms than do urban wage laborers in Egypt (see table 6.3). Lustig (chapter 20) demonstrates that the income effects of the Mexican maize subsidies are quite different for various rural target groups, that is, the net producers versus the net purchasers of maize among the rural poor.

Strong intraagricultural differences in costs and benefits of food subsidies and related price policies are also evident in Zambia, as shown by Kumar (chapter 21). There were regional differences—producers in the outlying and poor provinces were being subsidized and producers close to railway lines were being taxed, but there were also intraregional differences by farm size, induced by the importance of marketed surplus for farm households as well as by the significance of maize in the local diet.

In the case of Thailand's implicit consumer subsidy on rice, Trairatvorakul (1984) points out its very different effects on various types of farms according to farm size and production orientation. Whereas discontinuing the implicit subsidy (the producer tax) would hardly affect overall poverty levels in the country, income distribution within agriculture might change substantially, at least in the short run.

These country examples suggest that rural households and farm households are particularly affected by consumer-oriented food price subsidies that are a component of general agricultural pricing policies. Depending on the particular circumstance, such policies may improve,

TABLE 6.3 Effects of Egyptian food subsidies on income distribution within agriculture, 1981/82 (£E per capita per year)

Source of Gains or Losses	Small Farms	Medium Farms	Large Farms	Landless Farm Labor	Nonfarm Rural Wage Labor
Explicit food subsidies	21.20	15.60	13.68	19.57	29.52
Implicit food subsidies	2.66	2.37	−6.20	4.59	−13.93
Distorted producer prices	6.13	−8.93	−80.65	2.38	
Total	29.99	9.04	−73.17	26.54	15.59
As percent of total household expenditure	12.60	3.30	−18.80	14.00	3.40

SOURCE: Alderman and von Braun, 1984.

weaken, or have no effect on the real income position of the farm sector. It should be noted, however, that there are not necessarily causal relations between producer and consumer price policies. Each of a set of price policies may be designed to reach a specific objective.

Burden on Agricultural Production

The major orientations of subsidy systems vary as much as the levels and structures of consumer and producer prices accompanying them in the various countries. To assess the amount of consumer subsidization and to determine whether consumer subsidies tend to burden agricultural producers, the subsidized consumer prices are compared with the prices received by farmers and the equivalent international prices.

The analysis deals with the most important cereal commodity in each country's system: wheat, maize, or rice. The prices have been corrected for differences in handling and transport costs as well as for stages of processing (milling). Therefore, the price differences discussed are not due to normal marketing margins, processing stages, or different regional points of reporting, but presumably show the real effects of the prevailing market interventions. The international prices were corrected in the same way, and prices (both cost, insurance, and freight prices and free-on-board prices) were chosen according to their applicability to the potential trade situation. Where necessary, the short-run overvaluation of a country's exchange rate was also taken into account. With these adjustments, the international prices roughly reflect the opportunity costs of the food commodities in question. The data in table 6.4 refer to multiyear averages (1976–81) in order to avoid the influence of single-year fluctuations.

Three main features stand out in a comparison of price policies across the sample of countries:

1. In all of the countries, the explicitly subsidized *consumer price* is kept below the international price.
2. In all but the two middle-income countries (Brazil and Mexico) the *producer price* of the major subsidized cereal commodity is kept below its international equivalent price. This means the explicit subsidy schemes are in these cases accompanied by implicit subsidies to consumers at the cost of the farm sector.
3. In all but one case, Thailand, a *wedge* is effectively placed between the subsidized consumer price and the farmers' sale price. The wedge is the largest in those countries with the most subsidized consumer prices (taking the applicable international price as a benchmark)—Sri Lanka, Egypt, Brazil. In other words, a large subsidy is usually tied to a large wedge in countries that have explicit as well as implicit consumer food subsidies. This wedge may also result from consumer

TABLE 6.4 Price structure of the major cereal crop, selected countries

Country	Period (averages)	Major Commodity	Producer Price as Percent of: Equivalent International Price	Producer Price as Percent of: Subsidized Consumer Price	Subsidized Consumer Price as a Percent of Equivalent International Price
Sri Lanka	1977-80	Rice	83	151	55
Bangladesh	1977-78	Rice	78	150	52
Pakistan	1976-81	Wheat	88	115	77
Thailand	1978-80	Rice	65	100	65
Egypt	1978-80	Wheat	57	161	35
Zambia	1977-79	Maize	85	125	68
Brazil	1977-81	Wheat	100	312	32
Mexico	1978-81	Maize	116	139	83

SOURCES AND NOTES: For Sri Lanka, chapter 19 and unpublished data; for Bangladesh, chapter 15 and various World Bank statistics (unpublished). The international price is adjusted for overvaluation of domestic currency; the ratio of subsidized consumer price to producer price is the rationed price at the wholesale level and the procurement price (including marketing bonus); for Pakistan, Gotsch and Brown, 1980; for Thailand, Trairatvorakul, 1984, and various sources of national Thailand statistics; for Egypt, von Braun and de Haen, 1983. The international price is adjusted for the overvaluation of the Egyptian pound. The prices refer to wheat and wheat flour prices (in grain equivalents); for Zambia, chapter 21 and unpublished data. The price ratio for international and domestic producer prices refer to 1977/78-1978/79; in 1977/78 an export parity price and in 1978/79 an import parity price was applied. The producer-consumer price ratio refers to 1978-81; for Brazil, chapter 19, corrected for evaluation of Brazilian cruzeiro; for Mexico, chapter 20. A margin of 10 percent for handling was added to the cif import price.

subsidies being tied to some sort of quantity rationing in a multitiered consumer price system, allowing producers to sell at a higher price on the open market. However, although producer prices are not pressed below subsidized consumer prices in any of the countries, in Brazil and Mexico the wedge is sufficiently high to prevent an implicit tax on producers.

It should be noted that no significant relation seems to exist between the subsidization of consumers and the taxation or protection of producers. In addition, it is evident that a large-scale explicit subsidy scheme is not necessarily associated with a high tax on domestic agriculture. Sri Lanka and Egypt are two different examples of this. Sri Lanka has a low implicit producer tax on the commodities subsidized for consumers, and Egypt's is fairly high. On the other hand, it seems obvious that a reduced importance of agriculture in the economy may, depending on national income, allow producer protection to accompany consumer subsidization, as it has in Brazil and Mexico. Such countries may be able to afford to pursue

such a policy in order to meet various social and political objectives. However, in the poorest countries, such as Sri Lanka, Pakistan, and Bangladesh, producer prices were not far from their international equivalents during the late 1970s and early 1980s.

It should also be noted that implicit taxation of 10 to 17 percent in the countries just mentioned should not be considered out of the range of general taxation levels, especially since agriculture in these countries is also benefited by public services, such as rural infrastructure and productive investment in irrigation. Direct taxation of income from agriculture is not significant in most of the countries. In some cases (Zambia and Egypt in particular), high-input subsidies further reduced the difference between effective and nominal taxation; only the latter has been discussed so far.

This single-commodity perspective has some obvious limitations for evaluating food subsidy effects. A more comprehensive assessment of the effects on the aggregate taxation burden for agriculture is available for Egypt, which takes all major commodities, their relation in the production process, and related input subsidies into account (von Braun and de Haen, 1983). It suggests that farmgate prices of agricultural products developed quite independently from food subsidies. Moreover, the farm sector benefited from increases in input subsidies, which accelerated at roughly the same rate as consumer-oriented food subsidies. No evidence of food subsidies burdening farm income is found in this case, although distorted price ratios do result in misallocation of agricultural resources. Farmers are directed away from producing rice and cotton and toward producing fodder and livestock, which have high private but low social returns.

Government intervention may not affect only producer prices but also their stability. Increased price stability may act as a production incentive, and procurement systems tied to subsidized food distribution schemes provide a basis for stabilizing producer prices. In most of the countries with consumer-oriented subsidy systems, both consumers and producers are shielded to a large extent from international price fluctuations. This is true for India, Pakistan, Egypt, Zambia, Brazil, and Mexico. George notes that the stabilization achieved in India has had a positive effect on production (chapter 16). The substantial fiscal costs of handling buffer stocks for stable food supplies (mainly with consumers in mind) may thus yield some indirect benefits, because more stable prices are an incentive to production. This is also evident from a farm-level analysis in Egypt: grain prices were more stable, though lower, in villages with bakeries selling subsidized bread, and multivariate analysis showed that farmers increase their grain production with increased price stability (Alderman and von Braun, 1984).

The actual operation of a subsidized food distribution and procurement system is largely responsible for its effects on price stability. Ahmed points out that, in Bangladesh, allocations of subsidized food to rural

areas are much less stable than those for urban areas (chapter 15). Appropriate adjustments of fluctuations in production are required to avoid inducing further price instability on the open market, with corresponding adverse effects on efficient allocation of productive resources in agriculture. This is the purpose of the open-market sales policy in Bangladesh.

In several countries, procurement policies are tied to subsidized food distribution policies in some way. The effect of domestic procurement policies on production incentives differs substantially between countries. Krishna and Raychaudhuri (1980) show that in India procurement prices were generally below wholesale prices. They argue that, since the elasticities of supply for wheat and rice increased due to the effects of the green revolution, low prices for producers have increasingly had adverse effects on supply from domestic production. Procurement in Egypt is largely determined by fiscal considerations and import prices (von Braun and de Haen, 1983).

Burden on Agricultural Prices

One frequently stated hypothesis suggests that consumer-oriented subsidy policies tend to reduce agricultural growth and thus lead into a vicious circle in which the agricultural sector is increasingly taxed in order to maintain the subsidy for the growing urban population; or in brief, subsidy schemes perpetuate themselves at increasing economic costs. It is a startling fact that agricultural growth in most of the sample countries discussed above is higher than the average for their respective groups of developing countries. During 1970–81, growth of agricultural production in low-income economies was 2.3 percent; that of lower middle-income economies, 3.2 percent; and that of upper middle-income economies, 2.6 percent (World Bank, 1984c). Only Egypt and Zambia fell below the average level of growth achieved in their respective country group. This simplistic comparison of growth rates should be cautiously interpreted. It does not imply that consumer-oriented subsidy policies foster growth in agriculture. It does suggest, however, that despite such policies successful growth in agriculture may be achieved when appropriate policies accompany them.

The above hypothesis also implies that subsidy schemes lead to an inflexible producer price policy and higher producer taxation. However, this is not supported by results from studies of the dynamics of subsidy and price policies for individual countries. As further discussed below, many countries' price and subsidy policies demonstrate a high degree of flexibility.

When the Sri Lankan system was changed from a general subsidy with ration shops to a food stamp program, fiscal costs were reduced from 14 percent of the government budget in 1979 to 5 percent in 1982 (chapter

18). The subsidy rate of wheat distributed in the Bangladesh ration system in 1983/84 was about half of the 1977/78 level. The implicit tax rate on wheat and rice production shows a similar development (chapter 15). Although subsidized at the consumer level and implicitly taxed at the producer level, wheat production grew substantially because of successful implementation of technical change. Pakistan changed from a net importer to a net exporter for foodgrains during the 1970s. Explicit subsidies were sharply reduced, as were implied tax rates for cereal producers (Gotsch and Brown, 1980; Rogers, 1978).

While explicit food subsidies for consumers grew dramatically during the 1970s and 1980s in Egypt, the implicit taxation of the farm sector was reduced. The subsidy changed from an implicit one, mainly financed by agriculture, to an explicit one, financed out of fiscal resources (von Braun and de Haen, 1983). There is evidence that the burden on the farm sector was lessened because of increased political concern about growing import dependence. The consumer subsidy system in Zambia evolved out of a preindependence control system for the maize market that protected white farmers and that subsidized food for the labor in the mining sector. Domestic producer (line-of-rail) prices and consumer prices increased at the same nominal rates during the 1970s (11.6 percent), but the implicit taxation of maize production was much higher during the late 1960s than in the 1970s (Dodge, 1976). A subsidy for domestic wheat producers has been a common feature of the food policy in Brazil since the mid-1960s, but the subsidy for consumers became significant only after 1973. Due to the way the system is operated, the phasing in of the explicit consumer subsidy did not lead to depressed producer prices (chapter 19). Throughout the 1960s and until 1976 the Mexican system usually implied a producer tax and a consumer subsidy for maize, using equivalent international prices as the point of reference. Since then, it has gradually changed to a producer subsidy cum consumer tax system but has kept a substantial fiscal payment to finance the price wedge (chapter 20).

As is evident from the review above, the different countries have some common features in the way agricultural policies are aligned with consumer-oriented subsidies. First, most countries operating consumer-oriented subsidy systems still show highly dynamic changes in those systems and in accompanying producer price policies. This indicates that sound food policy research may effectively contribute to rational adjustments of food subsidy policies. Second, in countries where consumer-oriented food subsidies increased, such as Egypt and Brazil, this was not at the cost of producer prices. And finally, a number of countries have reduced their explicit food subsidies in recent years, including Bangladesh, Pakistan, Sri Lanka, and Mexico, but this was not achieved by increasing the implicit tax burden on food producers.

Reducing the Potentially Negative Effects of Food Subsidies

The effect of consumer-oriented food subsidies on domestic agricultural production and on the farm population is determined by the design of the subsidy scheme itself, by the design of the agricultural policy accompanying the subsidy policy, and by the characteristics of the agricultural sector.

Although subsidy systems are frequently oriented toward urban populations, some of the systems studied provide significant net benefits to the rural poor, including small farmers. The analysis here cannot lead to a balanced assessment of the costs and benefits of such systems, as the focus is basically on the cost side. In fact, any subsidy-induced distortions of agricultural incentives can be expected to induce a cost to the economy. In most of the countries studied here, consumer-oriented food subsidies are accompanied by policies that keep producer prices below their international equivalents. This means that implicit subsidies are joined with explicit subsidies for consumers at a cost to agriculture. But almost all countries in the sample make an effective attempt to dampen the potential price-depressing effect of consumer-oriented subsidies with a dual-pricing system. These attempts, however, need to be stronger and more effectively implemented.

The subsidy systems themselves, as well as the agricultural price policies accompanying them, show dynamic changes over time in most of the countries studied. In none of those cases where systems have been adjusted in recent years (by cutting explicit subsidies or expanding the system's outreach, for example) has the adjustment been at the cost of an increased (implicit) tax burden on agriculture.

A basic principle in introducing or maintaining a consumer-oriented food subsidy is to minimize the economic costs of such a policy, given specific consumption- or nutrition-related goals and distributional effects. This requires attention to the following six risks of food subsidy policies for domestic agriculture, some of which may have an indirect effect on production.

1. THE RISK OF EXCESSIVELY COMPLEX INSTITUTIONAL ARRANGEMENTS. Explicit food subsidy schemes tend to be inseparable from a buildup of fairly sizable and complex bureaucracies and decisionmaking networks in governments. These institutions become important voices in food policy. Acquisition of political power by such institutions may then lead to a separation of key decisionmaking powers in food policy. For instance, import-export regulations, domestic procurement, and pricing policy may be concentrated in one ministry responsible for subsidized food distribution, but agricultural investment, input supply, and research and development activities may be guided by another ministry. Implementa-

tion of consistent food policies becomes very complicated in such settings. Either continuous interaction among institutions concerning conflicting issues or higher level approval even for rather minor decisionmaking problems is then required. This limits the flexibility of the food policy decisionmaking process, especially in regard to adjustments to changing external economic environments with their respective costs for the agricultural production sector. A comprehensive decisionmaking structure for all food-policy-related institutions in a country is required to counter these risks.

2. THE RISK OF REDUCING PUBLIC INVESTMENT FOR AGRICULTURAL DEVELOPMENT. Explicit food subsidies may indirectly cause public investment in agriculture to be suboptimal because fiscal outlays for subsidies may compete with the agricultural investment budget, and insofar as food subsidies reduce domestic farmgate prices, the government may misguidedly make allocations to agriculture based on these distorted prices rather than on the relevant shadow prices. Careful assessment of the actual opportunity costs of domestic resources, based on the comparative advantages of alternative products evaluated at their long-term shadow prices, is a precondition for determining efficient public investment in agriculture. For example, the relevant shadow price for a yield-improvement program for cereals in an importing country is not the domestic procurement price, nor the domestic price on the open market, nor the average import price (which may be reduced on account of concessional imports). Instead, it is the marginal c.i.f. import price appropriately corrected for handling costs and overvalued exchange rates.

3. THE RISK OF FINANCING FOOD SUBSIDIES AT THE COST OF DOMESTIC AGRICULTURE. Explicit food subsidies must be financed. The fiscal problem of subsidies is frequently considered to be the most pressing one by policymakers. Sources of financing might include domestic or foreign borrowing (including grants), reduction of other fiscal outlays, or increased taxation. In countries that have not developed direct taxation systems, the agricultural export sector tends to be a principal candidate for taxation. In the case of an import-dependent food subsidy system, when international prices are rising there is a risk that taxes on agricultural exports would be increased in order to obtain the fiscal resources to maintain domestic consumer food prices. This could mean the agricultural export sector would be exposed to increased price instability, with additional adverse effects on production incentives in the long run. Comprehensive contingency planning for financing consumer-oriented food subsidies is needed to avoid such effects.

4. THE RISK OF DISTORTING INCENTIVES FOR FOOD PRODUCTION. If food subsidies are import subsidies, which expand the domestic food supply through imports, and if they are not combined with an equivalent additional expansion of demand, domestic food prices would be reduced, with

adverse effects on farm incomes and production. An export regulation could have a similar effect in a potentially exporting country. In determining efficient and fair levels of taxation between and within sectors of the economy, the implicit taxation of agriculture that results from such price depressions must be considered. Economic losses result from an overall price depression (which changes the terms of trade between agriculture and the rest of the economy) and also from resource misallocation within agriculture. This could result, for example from a depressed grain price that favors livestock production. In searching for second-best solutions in the short run, the domestic price structure should at least resemble the relevant long-term international price ratios for the traded commodities, unless very specific objectives such as resource preservation mitigate against it.

5. THE RISK OF DISTORTING INCENTIVES FOR FOOD PROCESSING IN FARM HOUSEHOLDS. The choice of commodities and their stage of processing for a subsidy system may induce competition with existing food processing functions such as milling, bread baking, or milk processing in farm households. Distortions of incentives that can occur at this level are frequently overlooked. Provision of subsidized flour to farm households, for instance, may lead to wasted resources if local or household milling facilities are then underutilized. Social costs may increase further if acquisition of the subsidized food requires substantial search and waiting time—time that was used before for household-level food processing activities, which are now transferred to a subsidized (public) enterprise. Additionally, these distortions may negatively affect the distribution of benefits of a subsidy scheme to villages and farms. This may be the case even if food processing on a larger scale turns out to be economically more efficient. It is mostly the rural poor and women who are employed in local and household food processing. Careful evaluation of the existing food processing businesses, including intrahousehold food processing, is necessary for an efficient design of subsidy schemes, especially in rural areas.

6. THE RISK OF HAMPERING DEVELOPMENT OF EFFICIENT STORAGE AND TRADING SYSTEMS. In many food subsidy systems, the public sector controls storage, transportation, and distribution functions, even at the retail level. In these cases, full potential of efficient private trading and storage, including on-farm storage, may not be used. Thus the differences between producer and open-market consumer prices may increase, with negative effects both for farm producers selling the surplus and for the rural poor who are net purchasers. Efficient design of the subsidized food marketing system is crucial, both to save fiscal costs and to minimize resource waste in the food and agricultural sector.

7 Political Calculations in Subsidizing Food

RAYMOND F. HOPKINS

State Intervention in the Food System

The role of the state in providing food subsidies to consumers has a long though sometimes ignoble history. In ancient Egypt, wheat prices were maintained by government storage schemes (chapter 13), and the value of cheap, ample food supplies for political stability was evidenced in the "bread and circus" era of the Roman Empire. However, detailed policy calculations connecting subsidies to production and nutritional status confront contemporary government leaders with ever more complex and confusing policy considerations (chapter 2).

Research has demonstrated that subsidies affect production and family income in various ways. Understanding such effects becomes relevant in policy considerations for politicians. These considerations are normally the focus of policy analysts. The ideal policymaker weighs the expected results of alternative food subsidy schemes. The ability of subsidies to achieve goals, such as more equitable income distribution, improved nutrition, greater demand in the economy, more efficient pricing of agricultural commodities, and enhanced human capital, are considered. Clearly, such concerns are not just abstract ideals; they have enlivened policy debates in national governments. Calculating benefits and costs in economic growth and equity is not only a standard way for academic analysts to approach food subsidies, but it is also one way political leaders explain their positions on food subsidies.

In this chapter, nevertheless, such goals and calculations are largely ignored. Instead, this chapter attempts to analyze food subsidies as a function of political support calculations. Focusing on political factors draws attention to how calculations of political effects influence the actions of government officials independent of economic factors.

Reliance on political calculations is frequent, but how decisive are they? Some historians and political scientists argue that political calcula-

tions are usually decisive and that they fully explain the expansion and contraction of state intervention in the food system—and more particularly the way in which intervention has operated to capture benefits for the most powerful (Tilley, 1975; Lipton, 1977; Hopkins et al., 1979; and Bates, 1981). These political calculations constitute the weighing of the political support for, and the opposition against, a policy decision. These calculations focus then on the expected reactions of different constituencies, which can range from expressions of satisfaction to violent protests.

Governments require at least some support to maintain effective rule, and this often depends on subsidies. Calculations frequently focus on the effects of subsidies on the most vocal constituencies—government employees and urban workers. When subsidies take on the aura of a right, an entitlement from the state, symbolic values as well as economic gains and losses may sometimes be at stake. Groups otherwise indifferent or only marginally affected by food subsidies respond to proposed changes in ways disproportionate to the economic consequences they experience. Thus two political roles for food subsidies are relevant: first, their import as material side payments to particular groups and, second, their diffuse symbolic fulfillment of a social contract type of obligation. These constitute the two basic categories of political experiences countries have with food subsidies and the concerns leaders express over the negative political effects of decreasing or ending subsidies.

Calculations based purely on politics—the idea that leaders are only concerned with obtaining maximum political support from subsidies at the least cost—is of course an abstraction. Leaders' real calculations also reflect altruistic and ideological ends, in which goals of economic justice or growth are sought. The considerations, however, are treated here only as instruments for maintaining or expanding power. Put another way, it is assumed that economic development or basic human needs are not ends in themselves, at least when anticipated consequences of subsidy policies are considered from a political standpoint. Furthermore, the effects of particular subsidy programs on production and income distribution become salient only as they shape responses of various political constituency groups.

Such a separation of "political" calculations may appear artificial. Economic forces surely shape political interests. Policy choices are made in a dynamic fashion, involving more than adding economic and political calculations.[1] Nevertheless, political leaders value tenure in office. Furthermore, political stability benefits economic productivity. Thus, the emphasis in interpreting political aspects of food subsidies should be on the gains in regime legitimacy and on the ability of governments to avoid instability,

1. I am indebted to Alain de Janvry for pointing out this concern.

while treating the economic causes and consequences of subsidies as either intermediate or exogenous concerns and not as ends in themselves. For example, in a political calculation a large, positive, societywide economic gain in productivity or income from a given policy should be sacrificed for another policy that promises less or no general economic gain but gives economic benefits to groups important for maintaining power, therefore yielding a greater net gain in support. The more that leaders discount their political future, the more this holds. A broader political analysis would try to explain the entire system of subsidy choices over time, including second-order political and economic interactions, but that is not attempted here.

This chapter is based on selected studies of consumer food subsidies. These case studies, supplemented by other works on food subsidies, support brief answers to three important questions about food subsidies: What political factors account for their origin? How much political support do food subsidies yield? And finally, to what extent are food subsidies seen as a political right?

In general, food subsidies must be viewed in the context of each country. For example, the presence or absence of electoral politics, the amount of legitimacy accorded the state, the degree and distribution of industrialization, the strength of organized political interests, the extent of a state's dependency on foreign governments, and the dominant social-religious values of a populace interact in such complex ways that each national case yields over time a distinctive set of dynamics and parameters. Each should therefore be examined over time to isolate political factors. The alternative approach—a comparison of covariations between subsidies and explanatory features across nations—is inadequate.[2]

Food subsidies arise under different conditions in each country. Subsidies considered here are those that result from specific and explicit food policies, not broad indirect subsidies arising from, say, overvalued exchange rates. These may be important, but their political relevance tends to be less because the government is less likely to be held responsible for them. Further, explicit subsidies have often accompanied major historical change, though sometimes they were an unplanned by-product of more accretional policy change. Because political leaders see the problem of food policy substantially as part of a "calculus" of maintaining support of an adequate coalition through quid pro quo exchanges, shifts in coalition

2. Cross-sectional regression analysis, for example, using states as basic units, is fraught with methodological pitfalls. Although it is tempting to write an equation with the size of consumer subsidies as the dependent variable and one or more political factors—such as class structure, party system, degree of military intervention, or political culture—as independent variables, it is ill advised, even if the marginal analysis assumptions of ceteris paribus could be made (Brunner and Brewer, 1971).

politics frequently account for changes in subsidy policy. Finally, macroeconomic and political factors, expressed in broad ideological positions, also explain alterations in particular food subsidy policies.

There are virtually no surveys on attitudes toward food subsidies in the literature. Benefits from subsidies are seldom costed according to religious, ethnic, or even rural versus urban data. Cabinet minutes and other evidence on the calculations of political leaders regarding food subsidy policy are not readily available. The assertions put forward in this chapter, therefore, are tentative.

Historical Origins of Food Subsidies

Countries do not develop their food subsidy policies all at once. Rather, policies result from the ebb and flow of larger events and are shaped by multiple forces. Nevertheless, three major forces help account for the origins of subsidies: social welfare goals; external international factors, such as World War II or the availability of food aid; and other policies of which subsidies are a secondary consequence. More than one of these forces may be important to the origins of subsidies in a given country.

Social Welfare

In places where food subsidies are most substantial and widespread they are connected with social welfare goals, often arising from a socialist ideology. This is true for China, Egypt, Mexico, Sri Lanka, and for several African states where ideology is prominent. In Egypt, under Gamal Nasser in the 1950s, a framework for providing food subsidies through government control of wheat prices and marketing, along with other rationed goods, was established. The system was built on a long history of food price control in Egypt (chapter 13). As the leader of a nationalist and socialist revolution, Nasser set out to redistribute income and opportunities. Control of food marketing and prices was an important element (Baker, 1978).

The Chinese system of food subsidies, launched in the early 1950s, was a major product of the revolution and was aimed at fulfilling expectations about social justice in a communist society (Harding, 1984). Similar, though more populist, impulses toward social justice account for the formulation of subsidy programs in Argentina, Mexico, and Sri Lanka. In Sri Lanka, socialist-oriented governments in the 1950s and 1960s consistently defended subsidies as a major policy instrument for social justice and reversed cuts after coming to power.

Socialist and populist origins, then, lead to broad food subsidy programs that entail major government intervention in the production and marketing of food commodities. They reflect political support that was manifest for goals of income redistribution, social solidarity, and economic

development. They usually follow major shifts toward socialist and even revolutionary leadership.

External Pressures

Consumer-oriented food subsidies also result from international inducements or constraints. Once subsidies become established, however, they endure even after the original conditions that led to their creation have changed. Food rationing that began during World War II is one example. Rationing occurred in virtually every country involved in the war. They all rationed scarce supplies to control inflation caused by the war effort. Social control, not welfare, was the major concern. After the war, food subsidization was slowly eliminated in Europe.[3] In Asia, however, many states retained the wartime rationing system. Bangladesh, India, Pakistan, and Sri Lanka, for instance, retained various systems for subsidizing food for consumers. Wartime exigencies themselves, therefore, do not explain the differences that occurred in the design and scope of food subsidy policy in the war years and especially thereafter.

In many cases, the governments coming to power at the end of colonial control had a strong social welfare orientation and interpreted the rationing and food subsidy system then in place as important to their national constituency; hence it was continued. It is possible that embedded special interests blocked removal of subsidies in some cases. Certainly, shifts in power from one to another political party or military ruler have not eliminated commitment to some form of subsidy program, although there have been substantial changes in the extent of subsidy coverage (chapters 16, 17, and 18).

International resources also encourage subsidies. A number of states have undertaken subsidies backed by food aid from overseas. United States food aid to Egypt from 1955 through 1967, available through Public Law 480, encouraged the food subsidy apparatus as an institution, even though the food was rather unreliably provided. Food price controls and modest subsidization were maintained in the 1950s partly in response to Nasser's ideology, but the availability of cheap American wheat made the undertaking especially attractive for a society that had a large urban, low-income class, many of whom worked for the government (Waterbury, 1978; Moore, 1974).

The food stamp program that began in Colombia in the 1970s is another case where external resources played a role. Colombia received Public Law 480 aid in the 1960s. For awhile this resource was used for targeted food interventions. When the U.S. State Department decided in 1973 to earmark Latin America for major reductions in the flow of food aid, a deci-

3. Targeted nutritional programs were started more recently in Europe.

sion largely the result of forced program cutbacks, Colombian government officials cast about for a follow-on program. These efforts failed. At the same time, however, a Colombian food and nutritional plan (PAN) was drafted. Approved in 1975 and implemented the following year, it looked to international cash resources for support. In contrast to the continuing Egyptian system, which expanded in the 1970s, the Colombian plan was terminated after seven years.[4]

Food subsidy programs also originate as side effects of other domestic policies, such as farm support programs or overvalued exchange rates, which create demands to continue the cheap food prices these programs initially cause. In Thailand, for example, rice prices kept below world-market levels are a form of consumer-oriented subsidy. The origin of the price gap, however, is explained by the use of export taxes on rice. The rationale for export regulations derived more from the interest of the state in capturing revenue, at least initially, than from welfare or nutritional concern for consumers. Such indirect subsidies are less politically relevant.

In Zambia the major impetus behind the Maize Control Ordinance of 1936, which led to food subsidies, was to give a marketing advantage to European commercial farmers. A marketing board was established to purchase European farm production at guaranteed prices, thus protecting European farmers from a perceived threat that production of African farmers would lower prices. At the time, Zambian maize prices were higher than world prices, and the board guaranteed European farmers a 75 percent share of the government-supported internal commercial market. Shortly, however, thanks to growing internal demand and rising world prices, all nonsubsistence production, including African production, was absorbed for domestic sales or exports. African producers benefited especially from the broader markets made available through the board's ability to export their crops as well as those of Europeans. Between 1943 and 1954, the marketing board provided subsidies to keep consumer prices down; it operated at a loss (Baldwin, 1966). Because most internally marketed maize was purchased by Europeans for their African workers as part of their wages, this subsidy directly lowered labor costs. The reductions of the subsidy that occurred in the late 1930s and late 1950s coincided with an oversupply of labor and falling wages. This correlation between higher subsidies and periods of upward pressure on wages suggests that subsidy benefits were

4. Miguel Urrutia, who was influential in establishing the Colombian PAN food stamp program, explained (in a personal communication) that the program was not a result of the food aid cutoff or a follow-on scheme. Efforts to do this, he noted, did occur, but were separate from the PAN development and basically failed. PAN did look to international as well as domestic resources for its design and funding, however, and thus on a minor scale can be seen as partially induced externally.

maintained to lower real costs to European employers rather than to provide the African population with inexpensive access to food (chapter 21).

By the 1970s, food subsidies, at least in urban areas, became almost a matter of social contract. Urban workers pressured the government to maintain current programs despite the country's economic difficulties (U.S. Department of Agriculture, 1981). Thus the food price policy in Zambia often had effects quite different from those initially intended. The subsidies began as a way to help Europeans; later they became a major expectation of urban African workers.

In summary, these examples of the origins of food subsidy programs indicate that disjunctions often exist between the interests that create a subsidy policy and its declared purposes, and between the initial intended purposes of the policy and its subsequent effects. World War II led to the creation of ration-type subsidy systems, but consumer well-being was a concern primarily to ensure social control. Large-scale subsidy programs may come into existence as a result of revolutionary change, as in China, but equally massive subsidies may arise more incrementally due to the historical juxtaposition of several factors, as in Egypt. In Egypt, Nasser's legacy, the absence of an electoral mandate, the availability of American food aid, and a price-setting policy that ignored inflation, created mounting subsidies in the 1970s. By 1980 subsidies cost nearly 15 percent of Egypt's total public expenditures, so that more money was spent on food subsidies than on the agricultural sector (chapter 12).

Finally, food subsidies may flourish or perish because of the interest of groups different from those that initially designed and established them. In Sri Lanka and Zambia, institutional arrangements that arose in response to one set of political interests or emergency requirements were continued and reshaped to serve other interests. In Colombia, perceived advantages from the coupon program turned out to be disappointing. As a result, whereas the Colombian program was a success according to criteria of efficiency, management, and nutrition, it failed to achieve sufficient political support to sustain it through a change of government.

The Power Calculus, or Who Gets What

Calculating political benefits and losses is not an easy task for politicians or external analysts. Several basic points about this process are worth noting. First, calculations reflect interests. Second, estimates about interests are crude. Third, relevant groups are hard to identify. Fourth, once these are provisionally selected, establishing subsidies involves considerable jockeying for credit and for control over the resource transfer. Fifth, subsidy systems may be a basis for strengthening political organization.

Finally, excluding groups from subsidies is easier when it is clear which groups are needed for the government to gain or keep power. Groups not needed for a winning coalition can be excluded. If uncertainty prevails, however, political leaders favor maximum coalitions, fearing to exclude any potentially prominent group.

Distribution of Interests

Initial design of and subsequent changes in food subsidy programs generally reflect the power of groups that support the program. Changes in the importance of subsidies for various major groups also usually affect the subsidy program. Consider rural producers. They may be negatively affected by food subsidies through lower prices for their crops if the subsidy is implicit; alternatively, they may benefit from subsidies that increase demand, and they certainly benefit from lower costs to themselves for food if they purchase food in markets reached by the subsidy system. In industrialized countries, farm groups generally support targeted explicit subsidies. They see these as expanding the demand for their products and thus increasing their earnings. In Egypt, although the evidence is scanty, rural populations seem to support subsidies. They gain substantial consumption benefits from them and, except for wheat and rice farmers, may not perceive adverse effects on their income as producers, thanks to controls that prevent low prices.[5]

In contrast, in Sri Lanka, farmers probably oppose subsidies or at least support their reduction, because, unlike farmers in many other developing countries, small farmers in Sri Lanka are politically important. Their support for the United National Party (UNP), which came to power in 1977, is notable. The UNP could count on a favorable political reaction from the rural areas when they raised producer prices. Farmers saw the large ration system as a price depressant.

Crude Calculations

Leaders' attempts to calculate their own short-term political costs and benefits are necessarily crude. Often groups with whom they can bargain are unorganized or do not exist, or they bargain principally in street demonstrations or through indirect forms of anomic behavior.[6] The political calculus begins with an existing set of programs and packages and with existing bureaucratic agencies. With respect to changes, political leaders

5. This judgment rests on the work reported in chapter 12 and on discussions in 1979 and 1983 with officials in the Egyptian Ministry of Agriculture and the Ministry of the Economy, who indicated that subsidies were not unpopular.

6. The problem of articulating grievances and expressing shifts in support by weak disorganized groups, especially peasants, is overcome in part by the collective effect of many small acts of resistance as well as by overt rebellions (Scott, 1985).

want to know what advantages will accrue to agencies that distribute benefits and what kinds of reactions will be elicited among various groups. Thus calculations tend to look at incremental adjustments unless a new government has come to power in an emergency.

At a minimum, government leadership needs adequate support from various sectors to ensure the performance of basic government functions. Calculations of the opportunity costs of different uses of financial resources in terms of the support and legitimacy of the regime, though often crude, certainly occupy leaders' attention (Hehman and Uphoff, 1969), and calculations can be subtle when the payoffs to specific bureaucracies are being examined, as Thomas's (1982) description of an African government's meeting to discuss an externally funded rural development project indicates. More often, though, groups' reactions are difficult to forecast. Before the January 1977 food riots in Egypt, the cabinet decided to reduce the budget. One cabinet minister explained that "of the four key budget items—military, investment, subsidies, and debt service—it was decided that the subsidies were the only expendable item." This judgment, according to one analyst, "overlooked the use of a subsidy program as a form of material incentive to secure mass loyalty to the regime" (Baker, 1978). These Egyptian political leaders were not myopic; they knew the feelings of military, industrial, and financial leaders. But they did not know well enough the feelings of the urban poor.

Where do politicians get information about the potential effects on political support of food subsidies? Indirect signals, based on seeming contentment, may be misleading. In 1977 in Egypt, the grumbling over price hikes turned to riots, which ceased only after the announcement that food price increases were rescinded; again on October 1, 1984, some food price rises were rolled back in the face of unrest. More direct and accurate signals may be derived from the reactions of government employees, who are often the first to know about proposed subsidy changes. A 1982 Egyptian executive order to raise sugar prices was rescinded before it was issued because of the reaction of civil servants who read the notice prior to printing. One of the virtues of a functioning political party is that it provides channels of communication to leaders from various interest groups whose reaction they wish to seek in advance. This is an important difference between Egypt and Sri Lanka.

Elusive Groups

The political calculus is made even more difficult for government officials by a combination of factors. Not only is anticipating the reaction of groups sometimes hard, but even identifying groups and determining which are relevant is not easy. In Third World countries, expression by organized interest groups is often discouraged. Sometimes the only well-

demarcated groups are urban laborers, government civil servants, and the military. What other groups are likely to respond to policy changes? Certainly the groups worth considering include more than those targeted under any particular scheme of subsidies. Those who nearly qualify also react to subsidy schemes, as do those who benefit or lose indirectly. In the indirect category, one might include employers and owners and operators of ration shops, bakeries, and food shops, because these may have substantial profits and losses associated with government fixing of prices. Also, some government officials benefit from the administrative prerogatives of subsidy programs.

In Bangladesh, key groups receive food subsidies as special benefits; these are identified in the legal framework of the program itself. The residents of six cities, hospitals, the military, and government employees, for example, have entitlement rights at ration shops. Aside from any efficiency gains, these rights also provide a bond between the government and the beneficiaries (S. Ahmed, 1984). Enumerating categories of groups for inclusion in food subsidies in such a country, where food is a central commodity, lends an element of stature and recognition to these groups. The same is true in Mexico, where specific ration shops exist for members of a particular trade union or employees of a particular ministry. An interesting question is whether enumerating groups causes discontent among those not included. If not, these policies provide an opportunity to target food subsidies more narrowly in countries where little targeting exists.

It is also difficult to assess the direction and intensity of reactions of groups once they have been identified, whether by statute or by analysis. Reactions depend on the perceived economic consequences for these groups, their predispositions toward that outcome, and the way in which food subsidy policy is presented. Note that groups are not solely interested in maximizing material goods. In short, there is considerable play in the system for designing different outcomes politically, independent of the technical details of a food subsidy program. Without information about underlying tolerance or support for changes in food subsidies, politicians tend to be risk averse and make few structural or price changes because the group interests affected are not clearly understood. Triggering political instability that proves more costly than continuing a subsidy is a mistake politicians try to avoid.

Credit Claiming among Agencies

Political leaders are quite prepared to claim credit for a popular move but try to distance themselves from policies that are liabilities. In 1977 and 1984, when riots erupted in Egypt in the wake of changes in the subsidy system, Anwar Sadat and Hosni Mubarak, who were blamed for the changes, immediately ordered prices rolled back. In 1984 changes in sub-

sidies in both the Dominican Republic and Mexico were blamed on requests for austerity by the International Monetary Fund (IMF); thus leaders tried to distance themselves from the reductions that led to discontent in Mexico and to violent protests in the Dominican Republic. In general, leaders prefer to blame international pressures or lower-level government agencies for unpopular changes in subsidy programs. In fact, ending or reducing food subsidies is a frequent change recommended by a government's budget officials and sometimes demanded as a condition for IMF loans. Moreover, the details of policy change in subsidies are worked out at subcabinet levels, and discrepancies between program purpose and implementation are normal (Pressman and Wildavsky, 1984).

A second kind of support calculus arises in deciding how a program is to be managed and what organization will get credit for it. The discontinuation of the Colombian food stamp program is attributed to a failure of officials to perceive sufficient credit and administrative benefits from the program. Not only did the government change hands in 1982, but the responsibility for the program shifted to the Ministry of Agriculture, which had a far greater interest in food production than in nutrition. Because the plan apparently did not create an institutionally important base among coupon recipients, more congenial and rewarding programs preferred by the Ministry of Agriculture received scarce budgetary resources instead. Moreover, by 1982 the opportunity costs of the program grew, as external assistance for it had largely evaporated. In the main, because the program was aimed at the poor, who had little political clout or close ties to the incoming government, it is not hard to understand the program's demise.

Argentina is another example of how political calculations can shape a food subsidy program. Argentina has powerful organized interests. In the spring of 1984 Raul Alfonsin, the recently elected head of state, announced the initiation of a national food plan (PAN). Coming during negotiations for structural adjustment assistance from the IMF and a rollover of large outstanding debts from private banks, the initiation of a food subsidy scheme seemed out of step with the normal procedure in which external debt leads to domestic austerity, including the reduction of subsidies.

In Argentina the food program was opposed by those without benefits—the Peronists and those favoring austerity. The Peronists initially voted in favor of PAN but later opposed it when they discovered that it was not targeted on their urban labor supporters but on the bottom 10 percent of the population—the unemployed and those whose children suffered malnutrition. Administration of subsidies was assigned to a government agency, the Ministry of Social Affairs, which strengthened the government by using national and local employees. The Peronists objected, however, because their party was not involved in the plan's administration. The Alfonsin government was attacked by conservative groups that argued that

PAN represented "the worst kind of populism." These groups favored the more standard package of structural adjustment measures, such as fiscal reform, effective pricing policy, and streamlined unemployment benefits (*Financial Times*, 1984, p. 8).

There were three political benefits for the Alfonsín government. First, PAN fulfilled an electoral promise of social justice by providing the most disadvantaged with forty kilograms of free food per month. Second, it developed popular support at the expense of the Peronists. And finally, it was a step toward improving the international position of the Argentine government vis-à-vis the IMF. The IMF was initially preempted from demanding welfare cutbacks for the poorest, and the plan gave protection to the budget of the Ministry of Social Affairs. Beyond these benefits, the Alfonsín program may have been a useful palliative to prevent urban unrest in the face of austerity measures imposed as a condition for further extensions of credit. By claiming credit for this program, the government bolstered its strength against both internal opposition and the IMF.

Building Political Organizations

Subsidy schemes offer a way to strengthen political organization. As the debate over control of PAN (in Argentina) suggests, the mechanisms of subsidies can be powerful political resources. Political entrepreneurs recognize the advantage of targeted programs that can be used as a reward for loyalty. Leaders use such projects or organizations to distribute food rather than mechanisms that yield no political advantages (Bates, 1981). Moreover, once the fiscal costs of building organizations have been incurred, subsidy schemes are even more attractive and even harder to dislodge.

Aside from the popularity of a program, the structure of dependency relations created by food subsidies may enhance general political stability. In patron-client cultures where political parties undertake considerable welfare and social control functions, subsidy schemes are a major source of patronage. In a more diffuse way, each disparate transaction may also enhance the image of the government as the provider of food.[7]

Another divisible benefit that can be dispensed is the licensing of shops to distribute subsidized food. Food stores in competitive markets regularly attract customers by discounting items. If a shop is licensed as a ration shop, there is natural inducement for customers to shop there and perhaps to purchase a variety of goods other than the rationed items.

7. This point was reinforced by discussions with Nora Lustig and Cassio Luiselli on Mexico. On the organizational power associated with distributive benefits, see Olson, 1965, and Bates, 1981. On the importance of political stability and the role of strong parties in attaining it, see Huntington, 1968.

Minimum Winning Coalition

A final element relevant to the calculus of political leaders is the proposition that a state tends toward rule by a minimum winning coalition. That is, regardless of whether electoral or other procedures are used to gain and exercise power, a leadership group strives to win by sharing the fruits of victory with as small a coalition of groups as necessary. If it is clear which groups are needed, then only a minimum coalition rules—because there is no incentive to add more. Fewer groups in the coalition means less bargaining on policy and more benefits for each coalition participant. Thus the clearer the calculus of groups, the less the governing coalition needs to placate outside groups (Riker, 1962; and Axelrod, 1970).

How does this apply to subsidy calculations? Basically, if subsidies are targeted to the poorest groups, they go to groups whose political importance is relatively uncertain. Subsidies may exist without much commitment when coalition leaders are not sure whether a group's support is really needed for it to stay in power. With improved information, a government can decide to target or to abandon a subsidy program as the ruling coalition is more narrowly defined. The case of Sri Lanka illustrates this. After the 1977 elections, the new government calculated that it needed little support from the urban poor. Thus it moved to cut back subsidies more forcefully than earlier governments, which had calculated either that subsidy gainers were in the winning coalition or that they affected its composition. Similarly, in Jamaica, when the conservative government had strong support in the early 1980s, it reduced benefits for groups not critical to its power.

Where uncertainty is high, subsidies are likely to be less targeted, since more groups are deemed possible candidates for the minimum coalition needed for effective rule. Where a coalition is shaky, reluctance to reduce subsidies is high.

Food Subsidies as a Political Contract

Bargaining over food subsidies takes place within a framework of expectations that are part of the general political formula, or effective rules for politics, for a society (Laswell and Kaplan, 1950). One expectation that may be part of the political formula is that a right to food exists. This myth can be a powerful one. When a subsidy takes on the aura of a right, the legitimacy of government action may be at stake. The right's particular meaning may be concretely embodied in something quite specific—the one-piaster price for a loaf of *balady* bread in Egypt or the rice ration in Sri Lanka. In 1953, the Sri Lankan government abolished the rice subsidy, producing a 280 percent increase in rice prices. This was followed by na-

tionwide strikes spearheaded by organized labor. After several deaths, the prime minister resigned, and the subsidy cuts were partially abandoned. In 1956, a socialist government was swept into power and restored the low price of rice, reducing the existing market price almost by half. Again in the 1960s, when the Ministry of Finance attempted to reduce subsidies, protests arose. Subsidies became the major issue of the 1970 campaign, and the party advocating the largest subsidies came to power and restored the weekly ration.

The pattern was similar in Egypt. The massive riots that erupted in Cairo and Alexandria in January 1977, following sudden rises in government-regulated food prices, shook the Sadat government. The political content of the protests was unmistakable. The party headquarters was burnt to the ground in Alexandria, and in Cairo crowds chanted "down with Sadat" and "with blood and lives, we will bring prices down" (Baker, 1978).

Although explicit food subsidies through rationing or fixed prices are only one element in a social contract between citizens and the state, when subsidies take on the character of a contract they also assume symbolic significance, and changes in them may call into question other elements of the social contract. Government food subsidies appear to constitute an implicit contract for many people in Egypt and Sri Lanka, and probably in Bangladesh, India, Mexico, Morocco, Pakistan, Tunisia, and Zambia. Is it possible that the Dominican Republic and Jamaica were able to reduce food subsidies in 1983–84—while Tunisia and Morocco were unable to do so—because subsidies were not regarded as a right in the former cases? If so, how was Sri Lanka able to reduce food subsidies sharply between 1978 and 1980, whereas Egyptian efforts to narrow subsidy costs proved abortive when, for both countries, subsidies as a right seemed to be established?

In Sri Lanka in 1977, the United National Party (UNP) won a landslide election, defeating the socialists. The socialist opposition was so badly defeated that the largest opposition party in parliament was the regional Tamil minority, the United Liberation Front. This shifted political disputes toward regional and ethnic issues and away from the economic ones that had dominated politics for three decades. The new government was committed to broad economic liberalization, including a substantial reduction in food subsidies. This commitment constituted a plan for changing the welfare component in the nation's social contract. Earlier efforts to accomplish this had resulted in food riots and widening unpopularity for the party in power. The first government action was not, however, to lower subsidies but to increase them by decreasing the price of subsidized rice available under the ration formula. Only at the end of the year, with GNP growth high, did the government announce that in 1978 a means

test would be applied to the rice ration. New ration books issued in January went to those who had indicated they earned less than Rs 300 monthly. No effort was made to verify the accuracy of these written claims, but those not claiming low income were excluded (Nelson, 1984).

At this point, the quantity and price of rationing remained the same, but eligibility was limited to roughly the low-income half of the population. About eighteen months later, after substantial preparation, a food stamp program was substituted for the ration books. More than seven million families, a slight increase from those getting ration books, received food stamps, and this number increased slightly in the first five months of the food stamp program. The technical value of the stamps was set so that most eligible families were able to purchase 15 to 29 percent more rice than under the discontinued ration scheme. Policy debate paid little attention to the possible erosion of the value of the stamps due to inflation. As when eligibility requirements were imposed earlier, the government was able to avoid the question of possible erosion (see chapter 18 for estimates of subsequent erosion).

Given the negative political repercussions of past efforts to reduce subsidies, the Sri Lankan cabinet accepted the new program with great caution. The most hesitant cabinet ministers were appointed to sit with the technical group preparing recommendations. At each stage, both the symbolism of the action and the short-term consequence were designed to elicit public approval. Thus subsidies were *increased* initially in each of the two steps of the food stamp system.

The major opposition party, the Tamils, framed disputes with the government as dissatisfaction with language and with religious and social policy. Although the Tamil population is generally less well off, its leadership did not stress economic issues nor did they ally themselves with other low-income groups. Furthermore, the Jayawardene government took a variety of steps to reassure the Tamils. The ethnicity issues distracted attention from the reductions in previous economic guarantees to the poor and the rapidly diminishing food subsidies.

The Egyptian case has many parallels with that of Sri Lanka, although Egypt has a larger population, is more industrialized and urbanized, and has a somewhat higher GNP per capita. Like Sri Lanka, a period of triumphant socialism in the 1950s and 1960s had instituted large-scale intervention in the economy by the government. In the mid-1970s, when Anwar Sadat became president, economic liberalization and withdrawal of the government from the economy was inaugurated. In September 1976 Sadat was elected to a second six-year term with 99 percent of the vote. This outcome and the People's Assemblies elections that followed, in which Sadat's Arab Socialist Union won 280 seats compared to 12 seats for the right and 2 seats for the left, appeared to confirm support for the re-

gime and its open-economy policies. Parties or elections were, however, quite shallow phenomena. As in Sri Lanka, economic experts in the government, foreign aid donors, and the World Bank were pressing for a reduction in subsidies, but the economy was buoyant, the political leadership newly legitimated, and the organized opposition virtually nonexistent. Why, then, did Egypt fail so utterly in 1977 and in 1984 to make significant headway in reducing its food subsidies?

Three reasons come to mind. First, government actions were neither well prepared nor undertaken in a way that promoted acquiescence. Second, the Egyptian government was divided over the issue. And third, the government was less legitimate than was the Sri Lankan government.

In 1977 the government provided little preparation for the changes. Although these subsidy changes were smaller than those announced in Sri Lanka, the first action in Egypt was to decrease subsidies, not increase them. Moreover, the less palatable changes in Sri Lanka were done with advance warning, which was not the case in Egypt. Thus the January 1977 riots were triggered by surprise and immediate anger, although the context was one in which growing resentment over the dismantling of Nasserite socialism was common among left-wing trade union officials and intellectuals.

The second reason contrasts the unity on the issue in Sri Lanka and in Egypt. There is reason to believe that the announced reductions in subsidies in Egypt were the result of a cabinet compromise. The cuts in subsidies fell far short of the ongoing recommendations by economic reformers within the government. On the other hand, old political hands warned against *any* tinkering with subsidies. What is interesting is that in 1977 the major food subsidy on wheat and bread was not touched; other subsidies on rice, sugar, and butane gas for cooking were targeted. There is no doubt that the political strategy used to implement subsidy reductions was poor. Sadat did not, as did leaders in the Dominican Republic in 1984, blame economic changes on external pressure. The strategy of liberalization and reduction of government's role was undertaken with politicians counting on other Arab states and the United States to see them through any problems. Not surprisingly, within a month of the riots, dramatic increases in pledges of both food and finance arrived. A cynical interpretation suggests that politically sensitive insiders, aware of the outbursts of strikes and demonstrations in January 1975, September 1976, and November 1976, had guessed that a bailout would follow the riots caused by tinkering with the food subsidy.[8]

8. In this sense, the political conservatives had little to lose by following the orders of the ascendant economic liberals in the cabinet. Indeed, it is common for subordinates dissatisfied with their leaders to implement orders they are fully convinced will not work out, rather than finding creative ways to reach the goals sought by leaders (Heclo, 1977). Heclo finds in

Since the failure in 1977, there have been several attempts to get the cabinet to approve subsidy changes. Shortly after Mubarak succeeded to power following Sadat's assassination, a package of economic reforms was rejected. More piecemeal and less noticeable steps to reduce subsidies were planned in the first half of 1983. The cabinet was increasingly aware of the enormous burden of subsidies and their inevitable growth if prices remained fixed in nominal terms.

To the extent that food subsidies are considered a right in Egypt or in other countries, governments may not peaceably alter them without some kind of public consent. Sri Lanka's alterations largely met this test. Failure to obtain consent through advance warning, discussion, and side payments for those most threatened may account for failures of planned changes in Egypt, Liberia, Morocco, and Tunisia. Of course, when subsidies are taken as a gift of the government with no special obligation, amending them involves only normal political bargaining, and an issue of legitimacy is not involved.

Food subsidies do seem a basic political right in many countries of Asia, Africa, and certainly Egypt, although the extent to which these are a fixture in politics varies. Some countries in Asia, such as Pakistan, have reduced their subsidy without experiencing instability or a threat to legitimacy. Indeed, a number of countries have reduced the size of the cost borne either by the government or by the agricultural sector without heavy political cost (Bienen and Gersovitz, 1984). In Egypt, it has been possible to shift the cost of paying for subsidies partially away from the farmer and to expand the accessibility of the subsidies in the rural sector, but the right of the government to modify the subsidies substantially has not been demonstrated.

Conclusions

This survey of how political calculations bear on explicit food subsidy policies has outlined two major ways that politicians regard subsidies, in addition to the conventional efficiency evaluations of economists and nutritionists. First, politicians can calculate the advantages to their coalition or government from offering or withdrawing subsidies to particular interest groups. In doing this they act much the same way as they would in calculating the distribution of other goods or services. In developing countries, interest groups tend to be weak. Often the most potent groups are

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his study of American leaders that immediate subordinates, when not in agreement, can sabotage the goals of political leaders by faithfully carrying out orders they know to be risky or foolish.

civil servants, the military, urban labor, and sometimes industrial interests. In Sri Lanka and India, in contrast, rural producers constitute an important group, at least for electoral purposes. In general, coalitions seeking the support of urban groups are likely to expand subsidies, while groups favoring economic liberalization and seeking support from rural sectors tend to reduce them.

A second way of looking at the political calculus examines the extent to which food subsidies have become an emotionally charged aspect of a country's political formula or real constitution. If a populace believes that access to cheap food is a right, then a government desiring to reduce subsidies should move with extraordinary caution, employing carefully planned techniques to maintain support. China's move in the late 1970s to raise producer prices for food commodities is instructive on this point. As urban food prices rose, in response to higher farm prices, the government specifically introduced a price wedge and a general wage increase to offset the initial effects of price changes on consumers.

In Egypt, two strategies were tried, in 1977 surprise announcements and compensation only for government employees; and in 1983–84 the other extreme, incremental and unannounced changes. Neither worked. In Sri Lanka and China, changes in the subsidy were possible without major political repercussions due to stronger, more capable governments and better tactics. In Egypt, government desires for change have thus far largely been unsuccessful. Perhaps this is also because of a higher emotional attachment to subsidies, but certainly because there is less competence in government and less trust among the populace. In Egypt there is fear that tinkering is a prelude to more drastic changes in the subsidies—the only remaining economic gain from the Nasser era. It is the anticipatory calculation of the populace in Egypt, not the absolute hardship of the small changes, that have made changing the subsidy policy in Egypt so difficult.

Where subsidies are not deeply imbedded as a right, their continuity must be explained by other factors, such as their importance to machine politics. The authority to license ration shops and the credit accruing from providing tangible goods can bolster government strength.

Once a subsidy is established, its political significance changes. At its origin it may fulfill a social mandate such as the Alfonsin government felt in Argentina in 1984 and the Chinese communist government felt in the early 1950s. After a subsidy is in place, maintaining its status becomes the focus of calculations, regardless of its emotional aura. If subsidies drain resources from industrial investment or reduce agricultural growth by indirectly taxing agriculture, good reasons exist to limit them or to sharpen their targeting.

The predicament for leaders is that it is easier to shift the subsidies away from the most needy groups than it is to withdraw them from politically influential or potentially volatile groups. Moreover, once a government is seen as liable for control of prices, it is difficult to return the price mechanism to the market. In Kenya, for example, the Moi government has regularly argued that it cannot remove controls on food production, marketing, and pricing lest these functions fall in the hands of Asian traders, an outcome for which African politicians believe they would not be forgiven.

The political costs of reducing subsidies, especially if done without appropriate political preparation, may be higher than the economic gains. If food subsidies have had negative effects on agriculture, governments may choose to introduce price wedges to reduce the burden on domestic agriculture without ending subsidies and their attendant political benefits. Basically, in the late 1970s both Egypt and China moved in this direction to stimulate agricultural production and reduce the burden of subsidies on the agricultural sector. Sri Lanka, on the other hand, chose simply to reduce total subsidies as part of a general economic transformation. Whereas Sri Lanka's subsidy changes coincided with complementary shifts in the general economic orientation and the withdrawal of government from the management of markets, in Egypt, and to some extent in China, the maintenance of food subsidies has been important in allowing economic liberalization in other spheres of the economy.

It seems likely that economic transformations in Africa involving the withdrawal of the state are likely to follow a similar course. The fall of the Busia government in Ghana in 1971 may be attributable in part to its failure to cushion the economic shocks of inflation, particularly on food prices. African states with weak capacities are likely to face real dilemmas if the fiscal cost of subsidies outstrips political, nutritional, and redistributive benefits.[9] Food subsidies may serve as political and economic side payments to the poor but are somewhat more important for a powerful urban populace when a government seeks to transform other aspects of the economy. In these cases, calculating solely the nutritional or economic consequences of subsidies does not give a full picture of the role that subsidies play in the political economy of a society. Several studies focusing on the effects of ending subsidies on political instability bring political economy analyses to bear on this issue, but their concern is rather narrow—the political risks of structural adjustment measures (Nelson, 1984; Bienen and

9. In Zambia, for instance, Kumar (chapter 21) estimates that the fiscal cost of subsidies to the Zambian government is about 5 percent of expenditures but supplies only 4.3 percent of the food expenditure of the poorest part of the urban population.

Gersovitz, 1984). Clearly, little research exists on the political aspects of subsidies at either national or local levels.

Research to examine the political calculations described here would broaden analyses of food subsidies by uncovering further benefits and costs not readily captured in economic and nutritional status measures. Benefits to the government of helping the poor through food subsidies derive not only from possible efficiencies compared to money transfers and the cost effectiveness as nutrition-oriented tools—their political benefits to leaders can also be important and perhaps sufficient to sustain them when other redistribution programs are ended.[10]

10. Pinstrup-Andersen and Alderman (chapter 2) point out that subsidies may be harder to resist politically than cash transfers, even if the food element is stamps, which are like cash.

8 Design and Implementation Considerations for Consumer-Oriented Food Subsidies

BEATRICE LORGE ROGERS

The effectiveness and efficiency of a subsidy program depend heavily on the specifics of implementation. Design of subsidy programs should take into account a number of factors, such as political acceptability, leakage of benefits to households outside the target group, cost, and nutritional effectiveness. This chapter discusses specific ways in which these factors can be considered in program implementation and then discusses the relative advantages and disadvantages of the commonest types of food price subsidy programs as they relate to conditions in individual countries.

Implementation Considerations

Local Conditions

It is assumed here that the decision has been made to implement a consumer food subsidy, either as a new program or as a continuation or modification of an existing program. If a subsidy is already in place, it will be more difficult to change, although not impossible, as the experience of Sri Lanka demonstrates (chapter 18). An existing subsidy system may also represent a significant resource that should not be wasted. For example, in much of South Asia (Pakistan, India, and Bangladesh), there is a nationwide system of ration shops. Consumers are familiar with the shops, and operators have the experience and knowledge to keep them regularly supplied and running smoothly. Thus the maintenance of this parallel market system represents a much smaller drain on government resources (including trained manpower) than it would in a country where such a system had to be started from scratch.

This is just one example of the important fact that a subsidy system must be designed to suit the particular local situation. Geographic, social, cultural, and economic conditions and available resources determine what is possible and efficient in a given country. There is no ideal type of subsidy, because the same system that is efficient and effective in one setting

may be unsuitable in a different place. Mandatory price controls on a portion of the food supply appear to be effective in the People's Republic of China, where a high degree of central authority is accepted (Timmer, 1981); price controls on the books of several West African nations are generally unenforced and unenforceable. Administration of an income-based eligibility criterion for program participation by means of a formal process of application and verification works well in the U.S. food stamp program because most of the population is literate and records of income are routinely kept. In a country where most income is received irregularly and in kind, such bureaucratic targeting will be less successful. For example, in Sri Lanka, the new food stamp system apparently discriminates against those with wage incomes, particularly tea estate workers, because their incomes are recorded and cannot be underestimated for purposes of determining eligibility. This creates inequity in the system (chapter 18).

The point may be extended to regional variation within countries. Where significant regional differences exist, it may be necessary to implement more than one system. In Bangladesh ration shops serve primarily the urban population, whereas the rural population is reached by food-for-work programs and open-market operations to stabilize prices (R. Ahmed, 1979). Some types of subsidy may simply not be feasible in remote, difficult-to-reach areas.

As will be discussed in more detail later, the local conditions that need to be considered include food purchasing and food consumption patterns of the population, whether food is domestically produced or imported, food transportation, storage and marketing infrastructure, availability of capable manpower, and others. These conditions must be balanced in designing a low-cost program with efficient targeting, maximum coverage, and high nutritional effectiveness.

Costs

The cost of a consumer food price subsidy is first of all determined by the size of the target population and the amount of subsidy considered necessary to meet program objectives. The cost of a nutritionally effective subsidy, for example, is bound to be higher where a large proportion of the population is poor (and thus constitutes the target group for the intervention) and where the gap between present food expenditure and that needed to achieve adequate consumption is also large. This has nothing to do with program efficiency but rather with the degree of need.

It is important to recognize that subsidy programs may be quite costly without being inefficient. Costs may be cut by improving program design and by reducing the amount of benefit received: the welfare effect will be quite different. Once again, Sri Lanka provides a case in point. The shift from a ration system to food stamps certainly reduced costs. This was

achieved by progressively reducing the real value of the subsidy by failing to adjust its nominal value to inflation. A second cost-reducing measure limited access to the subsidy to those eligible at the time the program was initiated. Leakage was reduced, but so were benefits to the intended target group (chapter 18).

Costs of a subsidy are of two kinds: fiscal or explicit costs—those that can be identified as budget items and that involve cash outlays—and implicit costs, which include income forgone by farmers, middlemen, or others as a result of market manipulations that reduce the income they might otherwise have received. Implicit costs may be hidden, but they are real and have real consequences. Other things being equal, it is better to make the costs of a subsidy as explicit and visible as possible. Even though this may be politically difficult, it makes it much easier to evaluate the cost effectiveness of the subsidy and to avoid unintended side effects.

Explicit costs of a subsidy may be divided into those that are fixed and those that are variable. Fixed costs may include investment in warehouses and shops and long-term commitment to civil service salaries. The main variable cost is the subsidy itself—that is, the difference between the cost to the government of making the food available to the consumer and the price paid by consumers. Different methods of subsidizing food will have different balances between fixed and variable costs. A ration shop system that requires the creation of a nationwide network of warehouses and retail outlets will have higher fixed costs than a food stamp program that relies on existing private-sector marketing. One criterion for deciding on a particular subsidy form is the amount of fixed cost that can be supported by the government and the degree to which facilities are available in the private sector. As was mentioned earlier, these costs are less of an issue if a government-operated parallel marketing system is already in place.

An objective of program design should be to minimize costs consistent with achieving the goals of the program. In simple terms, this means making sure that all or most of the costs of the program are used to reach the target population. Because subsidies address the purchasing power constraint on food consumption, the target group is composed of low-income households that rely on market purchases for their food. Note that this does not mean only urban consumers. In rural areas, a large proportion of the population obtains some or all of its food from the market, and this tends to be the low-income population, which has limited access to land. In Pakistan, for example, 61 percent of rural dwellers are net purchasers of wheat (Rogers, 1978).

Program cost can be controlled by keeping the size of the benefit small and by narrow targeting. These means of cost control must be balanced against nutritional effectiveness, however. Precise targeting and calibration of benefit size to need will reduce costs *for a given level of program*

impact, but achieving adequate coverage and benefits for a needy population may be quite costly.

For maximum cost effectiveness, the size of the subsidy and any quantity limitation should err on the side of generosity, with cost savings obtained by careful targeting to the needy. Setting the price of the subsidized food at zero is probably a mistake, however. One reason is that free food is very likely to be wasted, whereas even a small payment will make consumers think more carefully about their use of the food. Another reason is that a shift from free food to any price, no matter how small, will be much more difficult to implement politically than minor price adjustments.

Another area in which costs can be controlled is administration. There are two main sources of administrative cost in subsidy programs. One is the cost of procuring, storing, and distributing food, which requires staff, warehouses, vehicles, and shops. The other is the cost of monitoring and enforcement, including administering the determination of eligibility, which includes staff and office space. The first type of cost can be minimized to the extent the subsidy can rely on existing food supply and distribution mechanisms, generally in the private sector. The U.S. food stamp program, for example, involves no cost at all for food distribution, although a small percentage premium is paid to retailers who handle the stamps, and of course printing and issuing the stamps involves administrative expense. The program simply provides increased purchasing power for poor consumers in the existing food marketing system. In Pakistan, the system of ration shops for subsidized food is separate from other retail outlets, but central administrative costs (both national and provincial) are minimized because each shop owner is responsible for his own storefront rental and staffing and for transport of food from the provincial warehouse (Rogers and Levinson, 1976). The government pays for procurement, transportation to the warehouse, and storage.

The experimental food price discount program in the Philippines uses the private sector for procurement and distribution (chapter 14). An advantage of systems that rely on the private sector is that distortions in the economy are minimized so that appropriate price signals are given to the agricultural and food-importing sectors.

Reliance on private marketing is not feasible where the market does not operate effectively. There may be some areas that are so inaccessible and where purchasing power is so weak that no retail outlets exist. To reach these areas, there may be no alternative to setting up government-operated stores. This approach was tried in Mexico, for example (Austin and Cassus, 1975). However, the high cost of such an intervention must be recognized. The government cannot assume that it will operate more efficiently and cheaply than private retailers; if there are no private stores, it is

most likely because the cost of operation exceeds any profit to be made. Thus efforts to improve private marketing should be pursued where it is a viable alternative to the introduction of government stores.

There may also be areas where the local power structure has resulted in a noncompetitive market. Here again, the government may decide to operate a parallel market in order to introduce competition, but the costs are likely to be high.

The other source of costs is monitoring and eligibility determination. Targeting a subsidy is a way of controlling total cost, but if targeting requires establishing offices and hiring staff to process and verify formal applications, then the process itself can be quite costly. This is especially true where literate, trained manpower is scarce and could be more productive in other tasks. Other means of targeting, even if they allow more leakage, may result in lower overall expense because of the saving in administrative cost.

Targeting: Coverage and Leakage

Successful targeting of a subsidy involves maximum coverage of the target population and minimum leakage to nontarget households.[1] Minimizing leakage reduces costs and improves cost effectiveness; maximizing coverage increases costs but also improves the overall effectiveness of a subsidy. These goals conflict with each other to some extent, since stringent restriction of eligibility is likely to exclude some members of the target group along with ineligibles. This partly arises from difficulty of accurately assessing eligibility and partly from the fact that inconvenience—the "hassle factor"—will drive some people who are eligible away.

Coverage will be maximized in a program that is available to everyone. Examples of programs that appear to have been successful in improving nutritional adequacy include the untargeted, unrationed wheat subsidy in Egypt and the former untargeted rice and wheat subsidies in Sri Lanka. It is no coincidence that these programs are known for their high cost as well as for their effectiveness.

Another factor to be taken into account in deciding whether and how to target a subsidy is that a subsidy will be politically stronger the larger the constituency it serves. A program that identifies and separates the needy from the rest of the population may be divisive in that it may be seen to create or to legitimate an underclass. Such a program may be unacceptable even to the needy it is intended to serve, reducing coverage and thus

1. Targeting to individuals within a household by means of a price subsidy is probably not possible unless it is combined with some other intervention such as education. Selection of appropriate foods may increase the likelihood of the subsidized food going to certain individuals, such as children, within the household.

program effectiveness. Further, a program serving only the poor risks being reduced or eliminated in times of fiscal constraint because it may have no powerful advocates.

These arguments for an untargeted program are balanced by the powerful cost argument in favor of targeting, especially where the needy are a relatively small (perhaps 50 percent or less) proportion of the population. Politically more acceptable methods of targeting (for example, by quality of the subsidized commodity) might help to resolve this dilemma.

The political dangers of targeting to the needy will vary depending on the cultural acceptability of programs for the poor. The trade-off between cost effectiveness and political strength must be based on local judgment about the consequences of an expensive versus a narrowly targeted program. In the United States, for example, a source of the political strength of the food stamp and other food assistance programs, at least among some groups, is precisely the fact that they are seen to serve only the "truly needy." (They are also seen to serve the farm sector by increasing aggregate demand for food.) It should be recognized, though, that narrowing the constituency served by the program may be a preliminary step to reducing or eliminating benefits to those who remain. For example, there were no serious political repercussions when the Colombian food stamp program was discontinued, probably because the program was so well-targeted to a politically powerless group.

The higher the proportion of program eligibles in the population, the less of an issue is leakage. If everyone in a country is needy, then no program resources can leak to the nontarget group. In such a situation, a consumer subsidy would be very expensive but could be quite cost effective. The Philippine food price discount experiment targeted whole villages determined to have a high proportion of needy households. No targeting of households within villages was attempted (chapter 14). The problem is that the poor who are unfortunate enough to live in economically heterogeneous villages may be excluded.

Methods of Minimizing Leakage

There are several alternatives for targeting a subsidy to the poor and excluding the well-off. Probably the most attractive method is to select for subsidy a food that is in high demand among the target population but not preferred by the relatively wealthy. This should be a food with a high (negative) price elasticity of demand among the target group and a zero elasticity among the well-off. It should be economically inferior—that is, have a negative income elasticity at higher income levels—and it should have a relatively high intensity of consumption among the target group—that is, a high proportion of the total supply should be consumed by the target

group.[2] The advantage of this method is that the subsidized food essentially targets itself. The subsidy is available to everyone, but only the poor take advantage of it. This saves the expense and resource drain of bureaucratic determination of eligibility.

There are disadvantages, however. One is that targeting by this method is only approximate; each household itself decides whether or not to use the subsidy, and the well-off who are willing to consume the subsidized food obtain a benefit. The well-off may also benefit by buying the inferior food and reselling it to the poor at a price higher than the subsidized price but lower than the open-market price. The degree to which this kind of resale takes place depends in part on how stringent are the quantity limitations on subsidized purchases. If the ration is quite generous, then the poor have no need to purchase more at a higher price. The size of the subsidy also affects the likelihood of a food being purchased for resale. Given transaction costs and the fact that the resale price must be at least slightly below that on the open market, any profit to be made may be quite low if the subsidy is small. In any case, the cost of these two kinds of leakage is a trade-off against the administrative saving.

Another problem is political: the government may not wish to publicize the fact that it is promoting inferior foods for use among the poor. In Pakistan, for example, subsidized whole wheat flour has had a negative public image that has resulted in a mild targeting effect. The government nonetheless publicizes its efforts to maintain high quality in the ration foods (Rogers, 1978). The political consequences of subsidizing an inferior food—that is, inferior in its consumption pattern, not in nutritive value—will probably not be as serious in areas where the need is severe. In Bangladesh, for example, experimental distribution of the inferior grain sorghum was well accepted by the low-income population (Karim, Majid, and Levinson, 1980). In a relatively more affluent setting, such targeting by food selection might be impractical not only for political reasons (resentment on the part of the target group) but also because it may not be possible to identify any important food whose consumption pattern is strongly biased toward the needy. In the United States, for example, food consumption patterns of the lowest and highest income quintiles of the population are remarkably similar (U.S. Department of Agriculture, 1984). Further, among the poor, diet is quite varied—there is no one food that plays the central dietary role of rice and wheat in South Asia, or of maize in Mexico (chapter 20).

2. The coefficient of intensity of consumption is the ratio of the proportion of a subgroup in the population to the proportion of total supply it consumes. Coefficients greater than 1.0 indicate that the group consumes a disproportionately large share of the total supply of the food in question.

Another approach is to limit eligibility to a particular income group and to establish a procedure whereby people apply and are certified to receive the subsidy. The appeal of this system is that it avoids the leakages that can occur with self-targeted foods (which can be substantial) and that, in theory, the subsidy benefit can be provided on a sliding scale: since eligibility is based on income, households can qualify for a greater or smaller subsidy depending on how far below the income cutoff they fall. There are serious disadvantages to such bureaucratic targeting in most developing countries, however. First, the system depends on having a literate and numerate staff and will work much better if the client group also can read and do arithmetic. To reach throughout the country, the staff needs to be large, and this may be a serious misuse of trained manpower. Second, accurate estimation of income is no easy matter even in developed economies, where most people work for a regular cash wage and records are routinely kept. Where work is erratic, where many of the poor are self-employed, or where a large share of income is earned in kind, determining income with acceptable accuracy simply is not possible. At best, there will be considerable cheating, and the system will discriminate against those people whose wages are recorded.

An alternative to the calculation of income is to determine eligibility based on land ownership, ownership of other assets, or tax status. In cases where land ownership accurately reflects economic status, use of land as a proxy for wealth may well be effective. This method is clearly only appropriate in rural areas. The difficulty of verification is a serious barrier to using ownership of other assets, such as cars or houses, in this way. The problem with using tax status is that in many countries the taxpaying population is extremely small, so that tax status is not a good discriminator. Local conditions are clearly the determining factor here: literacy levels and degree of participation by the low-income group in the formal sector indicate the suitability of bureaucratic targeting.[3]

A third method of targeting is by geographic region. The region can be as narrow as a single urban neighborhood, as was the case in the LICONSA subsidized milk program in Mexico City (Overholt et al., 1981); a whole village, as in the experimental Philippine food price discount program (chapter 14); or a larger area. The success of geographic targeting is contingent on being able to identify areas where a high proportion of the population is needy and on controlling leakage outside the target area. In Mexico City, leakage was controlled because of the difficulty of storing fluid milk long enough to transport or trade it. Limiting the volume sold to

3. In Sri Lanka, bureaucratic targeting of a food stamp program was instituted as a cost-saving measure. However, this was a one-time effort, as the country plans to allow no new beneficiaries of the system (chapter 18). Thus the cost of targeting was not expected to be an ongoing part of the food stamp program.

one individual meant that traveling to the target area to purchase the low-priced milk was not economical.[4] In the Philippine case, target villages were those with high rates of undernutrition. These were identified using information on the growth status of children available from a growth-monitoring program already in place. Members of the target villages were identified with ration books. Even so, there was leakage, as family members from neighboring villages moved in to take advantage of the subsidy (chapter 14).

Enforcing a regional price subsidy—that is, preventing leakage at the borders of the subsidized area—is difficult. It is more successful if the commodity is perishable; if it is sold in limited quantities; if there are natural barriers to trade with other regions; and if the government already exercises control of marketing. Prices are manipulated more easily in the People's Republic of China than in Cameroon, for example, because of the acceptance of government intervention in the market. There may also be political problems with geographic targeting, especially if the geographic area targeted coincides with an ethnically or otherwise distinct population subgroup. In such cases, geographic limitations on a subsidy may exacerbate tensions between groups within a country.

Limiting the quantity that an individual can obtain at a given time may itself have something of a targeting effect. To the extent that obtaining subsidized food involves inconveniences like going to a special outlet or waiting in line, limiting quantities may make the benefit obtained uneconomical for households that can afford to buy more expensive food. However, in Egypt the well-off are not deterred by long waiting times at cooperatives both because they can pay others to wait and because the large quantities they can buy offset the costs of waiting (chapter 11).

Where the budget constraint on dietary adequacy is seasonal because food prices or incomes fluctuate, seasonal targeting may limit program costs without reducing the nutritional effectiveness of the program. Seasonal targeting means making the program available only during the lean season either by issuing time-limited coupons or by closing down distribution systems. It should be recognized, though, that severe seasonal food price variations may indicate inadequacy in the food storage and marketing system; this constraint should be addressed directly at the same time the subsidy program alleviates the effects of variability in the short term. Care should be taken not to eliminate the impetus to improve seasonal availability of food.

There may be administrative difficulties to implementing some kinds of subsidy programs seasonally. Food-for-work programs, for example,

4. Furthermore, targeting was probably achieved by quality, because the milk was reconstituted nonfat dry milk, not fresh.

typically aim to employ rural unskilled labor when private-sector employment is lacking. This may be during the rainy season, however, when many kinds of public employment—road construction and construction of irrigation systems, for example—are also not possible (Sahn et al., 1981). If subsidized shops are privately operated under a franchise-type arrangement with the government, the operators may resist a seasonal shutdown that would reduce their profits. In cases where the shops sell other goods as well as the subsidized food—as in Egypt and in some provinces of Pakistan—seasonal availability of the subsidy would be less of a problem because there are other sources of profit. In either case, the possibility should be considered of reducing, rather than eliminating, the ration in the good season. Seasonal targeting is clearly appropriate only in selected circumstances.

Programs that use the nutritional status of preschool children as a basis for targeting households for subsidized food distribution, such as the Philippine food price discount and the Colombian food stamp program, involve considerable administrative expense because of the requirement of regularly evaluating the growth of the children. Such programs generally use growth monitoring as an educational tool to teach mothers the importance of appropriate child feeding and as a means of individualizing health and nutrition education. Subsidized food distribution is ordinarily just one component of the program, and so the costs of growth monitoring should not be weighed solely against the benefit of targeting the subsidy. Growth monitoring is often considered valuable as a health intervention by itself, but it is probably not suitable as a targeting mechanism for a household-oriented subsidy on a national scale, unless, as in the Philippines, a system already operates in the country. One problem with such programs is that they may establish an incentive for poor households to keep at least one child below the criterion weight for height in order to qualify for the subsidy. It would be difficult to document the strength of such an incentive, as compared with the educational value of growth monitoring. Of course, such programs also discriminate against households without small children. Although these programs are more nutrition oriented than the usual household consumption subsidy, similar design considerations apply.

A final and very important point must be made regarding targeting. Any targeted program of food subsidies must contain provisions for terminating people from the program as they become ineligible—because of rising income, for example—and for permitting newly eligible people to enter the program. As households' needs and incomes vary over time, so should their eligibility for benefits. In the case of programs targeted by food quality, it is assumed that people will voluntarily stop participating when they are able to buy higher quality food. In bureaucratically targeted programs,

it probably makes sense to establish eligibility for a specified, limited period of time, after which the household must reapply. This puts the burden on the recipient and avoids the resentment and resistance (and possible program abuses) that would be encountered if program officials themselves decided when to review a household's eligibility. In the United States, certification for food stamps is typically for three or six months, and it is quite common for households to enter and leave (and reenter) the program as their economic circumstances change. The size of the food stamp rolls fluctuates with the unemployment rate and other economic factors. In comparison, Sri Lanka's program has fixed eligibility at one point in time and cannot respond to the changing economic circumstances of households.

The appropriate frequency of recertification depends on how rapidly economic circumstances are likely to change. In the United States, the certification period is six months for single mothers of small children who also receive public assistance, because their situation is stable. A two-parent household with an unemployed head of household is certified for three months or less, because of the probability that the household head will find work. Local economic conditions and the availability of administrative staff should dictate the length of the certification period. A reasonable minimum might be a few months; a maximum might suitably be one year. A system for removing and adding participants is essential if the program is to continue serving the needy and excluding those no longer eligible.

Methods of Ensuring Full Coverage

The major factors influencing coverage are convenience and accessibility. This applies both to the outlets for subsidized food and, if the program is bureaucratically targeted, to the certification process.

Convenience is maximized if store days and hours of operation meet the needs of the client population. The closer these are to those of other retail outlets, the easier it will be to take advantage of the subsidy. Similarly, outlets should be conveniently located so that people shopping for food can easily buy the subsidized commodities. Note that these conditions will be met if the subsidy makes use of the existing private sector retail system, except in underserved or remote areas.

Reliability of supply is a critical element in convenience. If supplies of subsidized food are not reliably available, then the cost of participation may be multiple trips to the store and long waiting times. This will add to the real price of the subsidized food. It is expected that the unrestricted demand for a commodity at subsidized prices will exceed the quantity normally supplied by the market. One way of ensuring regular supply is for the government to make up the difference by procuring the food domesti-

cally or by importing it.[5] Another way is to ration the food so that the limited supply is equitably distributed. Rationing, of course, also limits the overall cost of a subsidy compared with extra procurement at high prices. Rationing will be much easier to enforce if additional supplies are available on the open market at free-market (higher) prices.

In the absence of such methods, supplies will be allocated by less orderly means, such as long waiting times, which may affect consumers inequitably. Also, consumers should be permitted to buy small quantities of the subsidized food at a time and, in the case of a rationed quantity, to make several small purchases rather than a large one. Limitations may be imposed on the maximum quantity available to a household for reasons discussed above, but such limitations should not prohibit purchase of smaller quantities, since needy consumers may not have the cash to buy large quantities at one time nor the resources to transport and store large amounts of food.

These considerations of convenience apply to certification as well. Accessibility of food certification offices, convenience of hours, and efficiency of the certification process will all aid in raising coverage. It is easier to meet these conditions in urban areas where the population density is great. Certification is likely to be less convenient in rural areas; the special needs of the rural population should be accounted for in program design. More frequent certification increases the burden of the process. There are other factors in the certification process that can affect acceptance of the program by the target population, such as the attitude of the administrative staff and the language spoken. Needy consumers will hesitate to apply to a program if they feel alien or unwelcome when applying.

Maximizing Nutritional Effectiveness

Consumer food subsidies can affect nutritional status only insofar as undernutrition exists because a household cannot afford to purchase adequate food. However, there are ways of designing a food subsidy to maximize its nutritional effect in given circumstances. Perhaps the most important is to provide adequate quantities to account for leakage within the household. If vulnerable members suffer from inequitable distribution of the household's food (Carloni, 1981; Chen, Huq, and D'Souza, 1980), it may be expected that only a portion of the food made available through the subsidy will be received by these members. Nutritional effects will be seen if the overall quantity is large enough for all members. Without companion interventions such as nutrition education, whose effectiveness in altering intrafamily distribution patterns is questionable, there is probably no way

5. Concessional imports under Public Law 480 and other food aid programs have been an important factor in the implementation and maintenance of consumer price subsidies.

around the need to provide enough for all in order to reach particular individuals within the household. As mentioned elsewhere, a ration that is extramarginal also has the advantage of adding the price effect to the income effect of the subsidy, inducing households to consume more of the subsidized food.

Selection of foods for subsidy may also contribute to nutritional effect. The desirability of subsidizing foods that are self-targeting has been discussed. For the food to have a nutritional effect, it should be additional to food the household is already consuming, which means that the net effect of the subsidy on consumption of the subsidized food and of other foods must be considered.

The nutritional quality of the subsidized food is important. Any food can, in theory, be the carrier of an income transfer in the form of a subsidy, but one may expect that transaction costs and other kinds of inertia will induce people to consume rather than resell the food once it has been purchased. A food with a very high value and that is easily sold or exchanged is probably an exception to this assertion. Nonetheless, a subsidy that brings the price of a staple grain like wheat below the price of a staple starch like cassava will probably cause people to shift their consumption preferences and improve the protein content of their diets. The Women, Infants, and Children (WIC) program in the United States, a supplemental feeding program for pregnant and lactating women, infants, and children, provides subsidies on iron-fortified cereals in hope of shifting preferences away from unfortified cereals.[6] It may also be possible to use the principle of self-targeting to direct subsidized food to the vulnerable members of the household. If certain foods, particularly milk and possibly certain cereals or other foods, are thought of as children's foods, for example, selecting from them for subsidy may increase the likelihood of the subsidy's benefit going to children. This approach has been tested only in programs that also include nutrition education or other interventions.

The subsidized food will be more likely to be consumed rather than resold for cash (which may be spent on other food or nonfood items) if it is perishable, as in the Mexico City milk program cited earlier (Overholt et al., 1981). However, distribution of a perishable food entails serious problems due to the difficulty of safe storage and thus the need for frequent small purchases. This is feasible in a densely populated urban slum but not in a national program.

Subsidizing a high-value food, in contrast, will make the program more desirable for target as well as nontarget households, increasing par-

6. This is an example of using prices to influence consumer choice. An alternative might be nutrition education on the value of iron fortification, but this is difficult to implement, and the effectiveness of such education is quite variable.

ticipation and probably also leakage. It has been suggested in connection with food aid programs that provision of high-value food maximizes nutritional cost effectiveness by maximizing the income transfer inherent in the program (Reutlinger and Katona-Apte, 1984). However, a program that subsidizes high-value foods will entail high program costs, because targeting will be more difficult and leakage will probably increase. Of course, the subsidized price of the food must be at or below the prices of substitutes in the market, or the poor will not take advantage of the subsidy. It is probably more desirable from the nutritional point of view to put money into increased food quantity or a higher subsidy of a low-quality food than to spend money subsidizing high-value commodities.

Most subsidy programs in developing countries involve one or a few specific foods, and most of this discussion has dealt with the question of food selection. However, a program like the U.S. food stamp program provides a subsidy that is restricted to food but not tied to any particular commodity. From the consumer's point of view, this is desirable because it gives him or her the widest range of choices. But for nutritional effect, it is probably better to limit the range of foods for which the stamps can be used. In this way, foods with desirable nutritional characteristics and consumption patterns can be targeted. Another advantage of limiting the use of food stamps is that it makes the stamps less like cash and thus reduces incentives for resale of the coupons and for corruption in the certification process.

Common Forms of Subsidy: Advantages, Disadvantages, and Appropriate Uses

Food Stamps

A food stamp program is one that distributes stamps or coupons that have a cash value when used for food or particular foods in a commercial store. The buyer uses the stamps instead of cash, and the seller can redeem the stamps for cash from a bank or government office.

The major advantage of a food stamp program is that it makes use of the existing food marketing system. This reduces the administrative demands on the government to procure, ship, store, and sell food. It also permits individual sellers to regulate supply to meet demand at the most decentralized level. This makes it more likely that local supplies will be adequate, compared with a system where the quantities of food distributed to each outlet are centrally determined.

A second important advantage of food stamp programs is that they minimize distortions in the food market. Stamps place purchasing power in the hands of selected consumers, permitting both sellers and buyers,

including both program participants and nonparticipants, to respond to market signals rather than to government directives. Of course, this is an advantage only in a well-functioning, competitive market, where increased buying power calls forth increased supplies. Where monopolistic control exists, sellers can exploit the increased purchasing power represented by the stamps by raising prices. In such cases, other measures are needed to establish competitive markets.

Similarly, reliance on the existing marketing system may not be an advantage if the system fails to serve some areas of the country. As has been discussed, such inadequacy is probably due to the fact that marketing costs exceed potential profits. Food stamps, by raising real incomes, may alter this situation and encourage the private sector to enter these markets. If the income increase is not great enough to accomplish this, then the government may have to subsidize or directly operate distribution outlets. Thus there may be some areas where government-run outlets are unavoidable. The administrative cost is minimized if the food subsidy system relies on private-sector markets where they are adequate.

The major disadvantage of a food stamp program is that it requires some form of bureaucratic targeting and an administrative system for providing the stamps to eligible households. As has been mentioned, bureaucratic targeting based on income may be impossible in settings where income is erratic and not always in cash. Targeting based on other criteria, such as geographic region, landholding, or a child's growth may be more feasible, but the cost in trained manpower is still likely to be high. Bureaucratic targeting also carries the risk of eliminating eligible households either because these families are intimidated by the application process or because the offices at which they must apply are inaccessible. Design of such programs should take account of possible barriers to program participation inherent in the application process.

Food stamp programs require a well-developed banking system for distribution and redemption of the stamps and a degree of confidence in the government's commitment to honoring them. If the system is to function at all, consumers need to know that the stamps will be accepted, and food retailers must know that they will be repaid relatively promptly in cash. In both the U.S. food stamp program and the experimental Philippine food price discount program, a small percentage bonus is given to retailers as an incentive to participate.

Finally, the costs of physically printing, distributing, and redeeming the stamps can be significant. Printing must be of high enough quality not to be easily duplicated, and the paper must be durable under local weather conditions. Even in the United States, the discount coupons for the food package received by women in the Massachusetts WIC program were re-

cently consolidated into a single weekly voucher, despite the burden this placed on the recipient, because of the high cost of printing separate vouchers for each item in the package (Stern, 1984).

In summary, food stamps are most appropriately used where the existing market system functions competitively and serves all regions of the country; where literacy and numeracy are high; where incomes are known; where the program does not require an unreasonable use of trained manpower; where the government is relatively stable (to engender confidence in the stamps' value); and where the banking system is adequate for redemption of stamps. This suggests that a food stamp program is best suited to more developed economies with effective infrastructure.

Unrestricted Food Price Subsidies

An unrestricted food price subsidy is one that is neither rationed nor officially targeted, where unlimited amounts of the subsidized food are available at below-market prices to anyone who chooses to buy it. The major advantage of unrestricted subsidies is that coverage of the population is maximized, and so is nutritional effectiveness. Since no stigma is attached to participation, all the needy are likely to participate provided that the food at the subsidized price is cheaper than alternative staples. Since there is no limit on quantity, consumption effects can be substantial. By definition, unrestricted subsidies are extramarginal, which means that consumption is increased by both income and price effects.

In addition, problems of administering the subsidy are minimized, as there is no need to determine eligibility, to issue ration books or stamps, to monitor participants, and so on. And there are also political advantages to establishing a consumer-oriented program that is available to everyone.

The main disadvantage of an unrestricted food price subsidy is the cost, which is likely to be high and is also, to some degree, unpredictable, since the government has a commitment to provide all the food consumers are willing to purchase at the chosen price level, regardless of supply fluctuations. Of course, unrestricted availability of a food at below-market prices increases demand for that food. To avoid having the subsidy depress domestic food production, prices paid to producers as well as investment in food production capacity should be maintained by means of explicit government subsidy. This can be expensive, but it can reduce distortion and maintain the economic health of the domestic agricultural sector.

Part of the high cost of unrestricted subsidies is in leakage to groups that cannot be considered needy. Such leakage is inherent in the design of the program. Leakage is less of a concern if a high proportion of the population can be considered needy, and it can be reduced by selection of an economically inferior food—that is, one that is not preferred by the relatively well-off.

Targeting an unrestricted subsidy can also be achieved indirectly by paying for the subsidy with a progressive tax. Benefits are provided to everyone, but only the well-off pay the cost.[7] There are political advantages to this approach, as the subsidy is perceived to benefit everyone, which broadens its constituency. This approach depends on the power and administrative capacity of the government to implement a progressive tax system. Also, there must be sufficient income or wealth in the country so that it is feasible to derive revenue from taxes to pay for a subsidy. In the case of extremely needy countries, outside resources such as food and other economic aid are likely to be needed. In such cases, the consideration of maintaining incentives to develop domestic agriculture while implementing a subsidy is quite important.

An unrestricted subsidy is most suitable to areas where a very high proportion of the population is needy so that the cost of targeting is likely to exceed the savings from excluding ineligibles. It is also appropriate where local administrative capacity is so scarce that rationing or eligibility determination is simply not feasible. However, the high cost of unrestricted subsidies should discourage countries with severe financial constraints from undertaking them unless they can obtain outside resources. Governments have in some cases been caught by their commitment to low prices and have been forced to resolve the cost issue by relying on foreign food aid, by enforcing low domestic procurement prices, or by permitting supply shortfalls that result in informal, and usually inequitable, rationing by means of queuing, preferential agreement, or some other mechanism. Keeping the amount of the subsidy flexible is another way to resolve the cost issue, though it may reduce the amount of the benefit and thus the consumption effect of the program.

Subsidies on food prices tend to become enshrined as a political entitlement, and the broader the coverage of the program, the more likely this is. Increasing the subsidized price at the rate of inflation, which involves no reduction in the real value of the subsidy, still generates severe popular resistance, because the public is sensitive to nominal price changes. Subsidy costs in many countries have risen to excessive levels precisely because the government is unwilling to raise the nominal price of a subsidized food, thus allowing the amount of the subsidy to rise over time. Egypt is one but not the only case in point. A possible way around the problem is to build an annual price adjustment into the structure of the program so that price rises that do occur are small and relatively frequent. This appears to have worked successfully in Pakistan (Rogers, 1978).

7. This is the way the system of child allowances is administered in certain European countries. Eligibility is without regard to income, but the benefit is taxed away in upper-income households.

Rationed Subsidies

In a rationed subsidy, the quantity of food available at the subsidized price is restricted to a per capita or per household limit. The biggest advantage of rationing in conjunction with subsidy is cost control. Rationing limits the total cost of the subsidy and makes the cost relatively more predictable. A second major advantage is reliability of supply. If rationing is enforced, it should prevent shortfalls by restricting demand to match available supply.

Limiting the amount purchased at one time may have a targeting effect, because relatively well-off consumers cannot compensate for costs of participation—such as waiting in line or traveling to special outlets—by buying large quantities, as suggested by Alderman in chapter 11. Quantity limitation may also have the effect of reducing leakage in the sense of consumption in excess of that considered essential to nutritional well-being. However, the risk of trying to calibrate ration quantities to match some calculated measure of a "calorie gap" is that households may not allocate the food among their members according to strict nutritional criteria.

Rationing reduces the benefit available from a subsidy by limiting the amount that can be purchased at the subsidized price. If the ration is inframarginal—less than consumers would purchase without the subsidy—then the incentive effect of lower relative prices at the margin is lost, and the measurable benefit is only that of the income transfer inherent in the subsidy. Rationing also requires a relatively complex administration involving ration cards or books and a cross-checking procedure between consumers and distribution outlets. This requires sophistication and literacy among sellers and may also, as in the Philippine experimental program, involve some inconvenience and delay in the process of purchasing the food.

Rationed subsidies have a long history throughout South Asia. In these areas, long experience with ration procedures and high consumer acceptance mean that the problems of administrative complexity are reduced, though they might be considerable in a new program.

It makes sense to combine rationing with a subsidy when cost constraints are relatively severe, especially when administrative capacity is not extremely scarce at the local level. In practical terms, rationing is probably necessary in an untargeted program as an alternate means of controlling cost. The nutritional benefit of a targeted, unrationed program, however, will be greater for a given cost than that of a rationed, untargeted program, because rationing has only a minimal effect on leakage to customers who are not needy. Rationing even in a targeted program makes sense as a way of keeping program costs down.

Direct Distribution

Direct distribution is a form of subsidy in which quantities of food are distributed free to consumers. Direct distribution is often combined with other welfare-related programs such as health, education, and family planning. Distribution of food can be used as an incentive to participate in the other programs, and the cost can be shared among the different programs. A perceived advantage of direct food distribution is that the benefits are received by the target household or individuals in the form desired by the program planner, in contrast to price subsidies, where the income benefit may be spent on nonfood items. This advantage is partly illusory in that, unless the quantity distributed is very large and entails high transaction costs for resale, the distributed food may be resold or food purchases from other sources may be reduced. If the distributed food is different from foods available on the market—for example, if it is fortified or particularly nutrient-dense compared with market substitutes—then there could be an advantage to distributing the food. However, if the nutrient-dense food could be subsidized to a price below competing foods and distributed in a market setting, the same benefit would be forthcoming.

There may be political advantages to direct distribution of food. The food may act simply as a resource transfer to poor households but be perceived by the public as "feeding hungry children." Also, direct distribution may be the result of a target of opportunity, such as a particular food offered as aid from a foreign donor.

The logistical difficulties of direct distribution of food are substantial. On the administrative side, there are problems of procurement, storage, shipping, and other operations, and the difficulty of controlling losses at each stage. On the consumer side there are also logistical difficulties. If distribution is frequent, then the time costs of participation are high. If distribution is infrequent, then consumers are faced with transport and storage of relatively large and bulky quantities of food.

Direct food distribution requires some centralized planning and administration. This may create problems of matching supply at the local level with offtake, since decisionmaking may not be based on detailed information about local conditions in each area. Local outlets or programs should be able to order their own supplies as required. The cost of establishing a sufficient number of direct distribution outlets must also be considered.

Direct distribution other than as relief in acute famine situations is probably most suitable to middle-income countries where infrastructure, financial resources, and managerial capacity are not severely limited. It is appropriate where an existing network, such as primary health care cen-

ters, schools and preschools, or clinics, is widespread and functioning effectively, so that food distribution can share the costs of these outlets while reinforcing their programs.

Uncompensated Price Controls

Uncompensated price controls exist when the government simply legislates a fixed price below the equilibrium price and requires sellers to honor it. This is different from an implicit subsidy in which a food price is lowered by some intervention affecting supply and then the market is free to find an equilibrium price in the new environment. Examples are the rice export tax in Thailand (Trairatvorakul, 1984) and the compulsory procurement of wheat in India (chapter 16). In these cases, the domestic market equilibrates supply and demand, while uncompensated price controls fix the price, so that some other mechanism must be found for adjusting supply and demand.

Uncompensated price controls are frequently unenforceable and therefore ineffective. Price controls may seem like the most direct way to keep prices low, but if such an intervention is to be effective, the costs are unreasonably high, except in very special circumstances.

If controlled prices below free-market prices are enforced, then the quantity demanded will exceed that supplied, and consumers will compete for scarce supplies by queuing and by trying to obtain special preference from sellers. The social costs of such competition can be extremely high in terms of societal disruption and in time lost from productive and leisure activities. Price controls clearly also discourage investment in increasing production. The degree to which these problems are experienced depends on just how much below equilibrium the controlled price is. If the controlled price is high enough to permit a profit to producers and sellers, then market disruption will be less severe, although distortions in the incentives to produce and market the food will certainly exist.

Price controls are feasible only where there is a strong, effective government capable of enforcement and whose authority is widely accepted. This may be the case in a crisis situation, such as war or famine, when people recognize the legitimacy of extraordinary measures. The most appropriate use of uncompensated price controls is in combination with rationing in situations when a supply response is not possible in any reasonable time frame. For example, price controls with rationing in wartime prevent profiteering due to scarcity when a nation's productive capacity is being diverted to other uses. As a long-term strategy for ensuring adequate food consumption by a population, however, uncompensated price controls probably entail more negative than positive effects.

9 Alternatives to Consumer-Oriented Food Subsidies for Achieving Nutritional Objectives

EILEEN T. KENNEDY

Direct Nutrition Interventions versus Food Price Subsidies

Malnutrition is a problem associated with poverty. Although all poor people are at risk of having an inadequate food intake, it is usually the maternal and preschooler population that are the most nutritionally vulnerable. As a result, a number of interventions targeted directly on pregnant women and children have been implemented. Examples of approaches aimed at specific individuals include supplementary feeding programs, formulated foods or weaning-food projects, and nutrition education programs.

However, several recent reviews have indicated that the effectiveness of programs focused on mothers and preschoolers has often been less than expected (Kennedy and Pinstrup-Andersen, 1982; Beaton and Ghassemi, 1982). Even where these interventions have had a significant effect, the observed benefit is often achieved at a relatively high cost (Beaton and Ghassemi, 1982).

A more cost-effective alternative to these direct interventions may be a family-oriented program such as a consumer price subsidy. Berg (1981) concludes that, even if policymakers are interested only in reaching the preschooler, it could be more cost effective to reach them through programs affecting malnourished households as a whole. Beaton and Ghassemi (1982), in their review of supplementary feeding programs, come to a similar conclusion. In many countries, malnourished children cannot be reached effectively in any way that does not include the family. It is artificial to look at the individual household member in isolation from the family. By augmenting the food intake of the family, consumption by the child may in turn be increased.

Therefore, although the main purpose of this chapter is to look at alternatives to food subsidies, a useful starting point would be to establish the range of expected effects that subsidies can have on family and pre-

schooler caloric consumption and child growth. In order to do this, cost-effectiveness analyses will be used to compare different types of subsidies and other potential intervention strategies.

Comparison of Two Subsidy Schemes

A comparative approach is difficult because data are limited and studies have been conducted with varying degrees of methodological rigor. Three basic criteria were used to select studies for this comparative analysis. First, the research design had to include some type of comparison or control group. Second, cost data and a description of the intervention had to be included. Lastly, given the specific interest in preschoolers and pregnant and lactating women, information on these target individuals within the family had to be provided.

Because studies were selected on these three criteria, some potentially effective interventions were eliminated. For example, no food-for-work study that is currently available had information below the household level.[1] In fact, it was difficult to identify a food-for-work evaluation where any nutritional parameters were included in the study.

Previous chapters report that subsidy schemes can be effective in transferring income to the poor and can improve consumption. The evidence also suggests that, because broad-based subsidy schemes are expensive and entail large leakages to households where no calorie deficit exists, some form of targeting should be used in subsidy programs. Therefore, only targeted subsidy programs are considered here.

Two subsidy schemes—one in Mexico City and a pilot project in the Philippines—were chosen for this comparison. Both attempt to target benefits to low-income families with preschoolers or pregnant and lactating women. (For a more detailed description of the interventions, see Overholt et al., 1981; Garcia and Pinstrup-Andersen, 1987; chapter 14). Both projects attempt to target geographically. In Mexico, the program is targeted based on income and the presence of children under twelve years old or pregnant women in the household. Distribution centers for subsidized milk are located in the lowest income areas of the city.

The Philippine project targets rice and oil subsidies to villages where malnutrition among preschoolers is prevalent. The Philippine subsidy is an experiment and as such was deliberately targeted to the most nutritionally needy areas of the country. Selection of the sample villages was based on strict screening criteria: only those villages where 25 percent of preschoolers have moderate or severe malnutrition, based on weight for age,

1. Shubh Kumar and Raisuddin Ahmed of IFPRI are currently working with colleagues in Bangladesh on an evaluation of food-for-work projects, which will provide this type of information.

were included. Thus whereas the national average for moderate and severe preschooler malnutrition is 17.0 percent, the prevalence rates for the sample villages is 31.6 percent.

The data in table 9.1 indicate that study families in the two programs are similar in household size and number of preschoolers. Not surprisingly, however, the Philippine households are at higher nutritional risk; more of the households are calorically deficient, and there is a higher prevalence of preschooler malnutrition compared to Mexico City.

Although both subsidy programs are targeted to high-risk families, the household targeting was done with the particular intent of reaching the child. Therefore, a major interest in examining these two programs is to determine the potential of these types of schemes for improving nutritional status in children. Table 9.2 compares the cost-effectiveness of the two programs.[2] The cost per recipient is substantially lower in the Philippine project. However, given that in these programs the preschooler can be reached only through the family, the more appropriate measure is the cost per recipient family. In subsidy programs, it is only by delivering services to the family that the programs will reach the preschooler.

The annual cost per recipient family is higher in the Mexican program. In addition, the effectiveness of the programs in improving preschooler nutritional status is very different. There was no significant decrease in the prevalence of moderate and severe malnutrition in participating children in Mexico. However, based on preliminary findings from the pilot project, preschoolers from the subsidy families in the Philippines showed an 8.47 percent decrease in malnutrition compared to children in a control group who did not receive the subsidy (Garcia and Pinstrup-Andersen, 1987).

These disparate results are not surprising and are primarily due to two factors. First, the children in Mexico City are on average only mildly malnourished. One would not expect to see an average growth response based on weight for age in mildly malnourished children. The growth response of children to supplemental calories will be greatest in those who are the most malnourished; additional calories provided to the mildly malnourished are most likely being utilized for functions other than growth, such as increased activity (Beaton and Ghassemi, 1982). This theory is consistent with earlier work on the Mexican subsidy (Kennedy, 1983), which showed that, although there were increments in the family's caloric intake, a portion of which was captured by the child, this increment did not translate into a significant increase in growth.

Second, the methodological approaches of the two studies differ. The Philippine project was able to collect baseline data on nutritional status for

2. Throughout this chapter all costs have been converted into 1982 U.S. dollars.

TABLE 9.1 Comparison of food subsidy programs, Mexico and the Philippines

Item	Mexico	Philippines
Average size of family	6.50	6.1
Average number of preschoolers per family	1.95	2.1
Food subsidized	Milk	Rice and oil
Food costs as a percent of total program cost	74.00	86.0
Percent calorie adequacy of family	95.10	66.4
Percent of moderate and severe malnutrition	4.50	31.6

SOURCES: Kennedy, 1983, and Overholt et al., 1981, for Mexico; chapter 14 for the Philippines.

TABLE 9.2 Cost comparison of food subsidy programs, Mexico and the Philippines

Item	Mexico	Philippines
Annual cost per recipient (U.S. $)	38.16	8.90
Annual cost per recipient family (U.S. $)	95.40[a]	54.25[b]
Percent of decrease in prevalence of moderate and severe malnutrition[c]	0.00	8.47
Cost per child removed from moderate or severe malnutrition (U.S. $)	[d]	331.00[e]

SOURCES: For Mexico, Overholt et al., 1981; for the Philippines, chapter 14.

[a]Based on 2.5 recipients per family.

[b]Based on a family size of 6.1 members.

[c]Defined as weight for age less than 75 percent of standard.

[d]Does not appear possible with program as currently operated.

[e]Based on comparison of the reduction in the number of children in control and treatment groups removed from second- and third-degree malnutrition.

both the program participants and comparison children prior to the implementation of the pilot subsidy. Because the Mexican subsidy was an established program, information on participants was available only after they had already received program benefits. The inability to show that the milk subsidy program is improving preschoolers' growth in Mexico may be because the group of children who received the subsidy is not comparable to the group who did not. The preschoolers from subsidy households may have been at greater nutritional risk. The Philippine project was effective in decreasing the prevalence of malnutrition in preschoolers. These data suggest that a subsidy that is properly targeted to nutritionally needy families can be effective in improving preschoolers' nutritional status. The next step is to determine if alternative intervention strategies are more effective in achieving the same end.

Supplementation Schemes and Integrated Health and Nutrition Programs

Supplementary feeding programs for young children and pregnant or lactating women are common and popular in many developing countries. Supplementation programs typically provide rations of 200 to 400 calories through noncommercial channels to pregnant and lactating women and to preschoolers. Cost data from supplementation schemes in five countries were used to assess the potential of these programs as alternatives to targeted subsidies. Table 9.3 compares the five programs. In all five areas, energy intake was low, ranging from 59 to 75 percent of calorie requirements. The requirement used for preschoolers is 1,360 calories per day. The calories provided in the supplement vary widely from 298 to 737 calories, which if totally consumed would fill from 67.0 to 88.2 percent of the estimated calorie gap.

Table 9.4 presents data on the annual cost per child in each of the five programs. The variation in the costs per recipient are in large part a reflection of the size of the food package and the types of food distributed. Costa Rica, with the largest caloric supplement and most expensive foods, has the highest cost per child. The more important indicators are shown in column 2. The cost of delivering services to each malnourished child is very high in Colombia, the Dominican Republic, and Costa Rica. This is because the prevalence of malnourished children is low in the study population.[3] In countries with a high number of malnourished children, like India and Pakistan, cost per malnourished child is not much different from the annual cost per recipient.

In order to compare these data to the subsidy results shown in table 9.2, an attempt was made to determine how much it costs to remove a child from moderate or severe malnutrition. However, the five programs as they now operate do not represent a viable way of making this evaluation, because the programs fail to decrease the prevalence of moderate and severe malnutrition.

Two reasons account for this disappointing result. First, the magnitude of the nutrition problem is low in three of the five countries. Thus the results are similar to those in Mexico City. If the population served is not very malnourished, it is unlikely that a significant growth effect or change in caloric intake will be detected. Indicators of the effects of the program other than growth may be more appropriate. Only in India and Pakistan are major growth deficits apparent. Even in the countries where growth retardation is prevalent, the supplement compensates for only part of

3. In Anderson et al., 1981, below 90 percent of weight for age is used as cutoff point for identifying the malnourished. If the more conservative estimate of less than 75 percent of weight for age were used (as in tables 9.3 and 9.4), prevalence rates would be even lower and cost per malnourished child higher.

TABLE 9.3 Comparison of supplementary feeding programs, selected countries

Country	Program Type	Weight for Age as Percent of Standard	Change Due to Program	Height for Age as Percent of Standard	Change Due to Program
Colombia	Take home	88.8	−1.7	93.4	−0.8
Dominican Republic	Take home	92.2	−0.3	96.1	0.0
Pakistan	Take home	79.4	+0.1	93.1	−0.3
Costa Rica	On site	93.4	−3.6	96.5	0.0
India	On site	72.9	+1.6	89.7	+1.0

SOURCES: Data from Anderson et al., 1981; Beaton and Ghassemi, 1982.

[a]To determine the percent of the calorie gap filled by the supplement, calorie intake was divided by the calorie gap and multiplied by the percentage of months when food supplement was available and by the percentage of participants who ate.

TABLE 9.4 Costs of supplementary feeding programs, selected countries (U.S. dollars)

Country	Annual Cost per Child	Annual Cost per Malnourished Child Served
Colombia	42.08	442.90
Dominican Republic	24.48	119.37
Pakistan	39.97	48.74[a]
Costa Rica	160.72	493.00
India	24.51[b]	40.70

SOURCE: Data from Anderson et al., 1981, updated to 1982 dollars.

NOTE: Cost per child removed from moderate or severe malnutrition cannot be evaluated on the basis of results.

[a]Take home, only.

[b]Average cost of on-site and take-home supplementary feedings.

the energy gap—6.6 percent in Pakistan and 28.2 percent in India. This was due largely to infrequent participation by children in the feeding programs.

Supplementary feeding programs have the potential to improve consumption and nutritional status, but the actual results have been discouraging. The most effective supplementation schemes appear to be ones with a strong tie to health care. Integrated health and nutrition (IHN) interventions are projects that provide a mix of health care, nutrition, family planning, and water and sanitation. Although the nutrition component varies, it most typically includes a combination of food, nutrition education, and

Average Calorie Intake	Average Calorie Gap	Calories in Supplement	Increase in Calorie Intake	Percent of Calorie Gap Filled by Supplement[a]
978	382	305	165	21.6
877	483	337	48	6.0
1,004	356	298	131	6.6
1,033	327	737	462	88.2
811	549	340	160	28.2

growth monitoring. Not every individual receives all services; there is a selective use of program components based on individual need.

The Narangwal and Tamil Nadu projects in India are two examples of programs that provide nutrition services as part of a larger intervention. Although supplemental food is available, not all children participate. Very strict growth velocity criteria are used to identify children under thirty-six months of age needing food. In Tamil Nadu, about one in three of the children weighed actually received food. Similarly, in Narangwal, although food was available for all children, malnourished preschoolers were particularly encouraged to attend the feeding centers. For pregnant participants in Narangwal, only those women who were underweight at time of conception were eligible for the food supplement.

The relevant costs for Tamil Nadu and Narangwal are shown in table 9.5. The costs per recipient in Tamil Nadu are lower than the per-child costs of supplemental feeding. The IHN costs per family are lower than in the subsidy schemes. In addition, the cost of removing a child from malnutrition is substantially less in Tamil Nadu than in the Philippines. This may seem surprising given that one would expect that, as the intensity of services provided increases (as in an IHN project), the cost per recipient would also increase. However, in the Tamil Nadu project, there is a selective distribution of food. Because food is the most expensive component, this decreases dramatically the cost per recipient. The annual cost per child decreased in Tamil Nadu from twelve to eight dollars (U.S.), while the cost per child fed increased from twenty-one to thirty-eight dollars, as fewer children required rehabilitative feeding (World Bank, 1984a).

It would appear that selective use of supplemental feeding in an individually targeted program can be cost effective. However, the relative payoffs of various service components may differ depending on the age of the recipient. Table 9.6 shows data on the cost effectiveness of health and nu-

TABLE 9.5 Costs of two integrated health and nutrition projects: Tamil Nadu and Narangwal, India (U.S. dollars)

Item	Tamil Nadu	Narangwal
Annual cost per recipient	20.76[a]	49.91
Annual cost per family	20.76[b]	49.91
Cost per child removed from moderate or severe malnutrition	51.00	

SOURCES: For Tamil Nadu, World Bank, 1984a; for Narangwal, Kielmann, Taylor, and Parker, 1978.

[a]Cost for each child fed; cost for a child who is only weighed and screened is 12.34.
[b]Assumes an average of one participant per family.
[c]Not possible to determine from the data reported

TABLE 9.6 Mortality rates of Narangwal children by experimental groups

		Program Types		
Number of Children	Control Villages[a]	Nutrition Supplementation	Medical Care	Nutrition and Medical Care
Births	805	352	343	654
Number of Children 1–3 years old	1,398	634	635	1,285
Mortality Rate				
Perinatal[b]	104	61	81	63
Neonatal[c]	78	46	47	47
Postneonatal[c]	51	43	23	34
Infant	129	89	70	81
1–3 years old[d]	19	10	11	13

SOURCE: Kielmann, Taylor, and Parker, 1978. Reprinted by permission of American Society for Clinical Nutrition.

[a]Includes four villages of a parallel population study.
[b]Per 1,000 live births and stillbirths.
[c]Per 1,000 live births.
[d]Per 1,000 children 1 to 3 years old.

trition components in decreasing mortality.[4] Prenatal supplementation, either alone or in combination with medical care, was the most cost-effective means of decreasing perinatal mortality. Medical care was most effective in reducing infant mortality, and nutrition or health care were equally effective in decreasing mortality in children one to three years old. In all cases, mortality was higher in the control villages.

4. Perinatal mortality is defined in this study as stillbirths and deaths during the first 7 days. Neonatal mortality is death during the first 28 days. Postneonatal mortality is death from 29 to 364 days. Infant mortality is a combination of neonatal and postneonatal mortality.

These Tamil Nadu and Narangwal programs have several features in common. First, there is a strong emphasis on targeting to nutritionally vulnerable individuals. The programs are aimed at pregnant and lactating women and children under three. In Tamil Nadu, India, children under three years old are screened further to identify the malnourished, and only these children receive the food supplement (World Bank, 1984a). Once the children's nutritional status has improved to a certain level, the supplementation is stopped. Critics of this approach have argued that by using the attainment of adequate growth as the exit criterion, mothers will deliberately keep the child undernourished in order to stay in the program. There is no evidence to suggest this has happened in the Tamil Nadu project.

The rationale behind the prudent use of the calorie supplements is that not everyone needs the additional foods. An inadequate energy intake may or may not be the basis of the nutrition problem. Given that the major cost in most interventions is the food, the selective use of supplementation will minimize the cost per recipient without jeopardizing the nutritional effectiveness. The results of both the Tamil Nadu and Narangwal projects demonstrate that this can be done successfully.

The "food-as-medicine" approach works best when there is a need for immediate remediation of moderate and severe malnutrition. Preschoolers with severe weight deficits have a mortality risk approximately seventeen times higher than normal-weight children (Kielmann, Taylor, and Parker, 1978).[5] The distinction sometimes made between short-run versus long-run strategies is a moot point for these children, for whom there is often no long term. In order to alleviate severe preschool malnutrition, the IHN approach usually makes more sense than a subsidy transfer to the household. In addition, IHN projects also can be effective in preventing nutrition-related problems (Kennedy and Pinstrup-Andersen, 1982).

However, what happens to a young child when he or she is terminated from one of these highly targeted interventions? If the precipitating cause of the child's weight deficit was inadequate food within the home, the preschooler's malnutrition is likely to recur. In this situation, subsidy schemes targeted to food-deficit households will complement the IHN program. The therapeutic focus of the IHN program will be balanced by the preventive emphasis of family-targeted subsidies.

However, malnourished children are sometimes found in households where food supplies are adequate. In these cases, subsidies are not the answer. A combined growth-monitoring and nutrition education program may be effective. Growth monitoring in Indonesian children was shown to

5. For moderately malnourished children, the mortality rate is six times higher than for normal-weight children.

significantly improve child growth even when food was not distributed (Rohde, Ismail, and Sutrisno, 1975).

Conclusions

A variety of ways exist to improve consumption and nutritional status. The particular policy instrument chosen should be dictated in large part by the nature of the malnutrition problem. In this section three types of interventions—subsidies, supplementary feeding, and integrated health nutrition programs—are looked at as a means of alleviating preschooler malnutrition. Although the issues that emerged from the comparative analyses should not be taken as hard and fast guidelines, they can be used to draw conclusions about factors that influence program effectiveness.

Geographic targeting as a means to reach malnourished households can work if a program is able to identify an area with a high proportion of calorically deficient households. The two subsidy schemes that have been used as case studies in this chapter are geographically targeted to households. The results, however, differ. Geographical targeting worked well in the Philippines because the treatment villages had a high prevalence of food-deficit families and malnutrition among preschoolers. The targeting to low-income areas in Mexico City was less effective in achieving the same result, mainly because the overall prevalence of growth retardation was low. In the Philippines, one in three children was less than 75 percent of normal weight for age, whereas in Mexico City it was only one in twenty. In order to reach the most nutritionally needy preschoolers in Mexico City, a more extensive selection procedure would be needed. By adopting a more sophisticated certification system, the costs per recipient would increase, but because there would be fewer participants, the total program costs could decrease. The data from Tamil Nadu point this out (World Bank, 1984a). As preschooler malnutrition decreased in the project area, the projected cost per child fed increased from U.S. $20.76 to U.S. $37.82, but total program costs decreased, because significantly fewer children needed food.

In Mexico City in 1977, there were approximately 250,000 subsidy recipients. If 5 percent of these participants are the intended target audience for the program (table 9.1), approximately 12,500 people need to be served. Even if the costs per recipient double because of the additional screening procedures, total costs of the program would still decrease by a factor of ten. Alternatively, the program could serve a greater number of the most nutritionally vulnerable at the same level of expenditure.

One point is worth repeating. In the analyses, growth is used as an indicator of a program's effectiveness, but a growth response is unlikely in mildly malnourished children; this is probably true regardless of what type

of intervention is used. For example, preschool feeding centers in which only 15 percent of the new entrants were malnourished were found to have no effect on growth (Anderson et al., 1981). Other indicators of a program's effectiveness may be more appropriate. As preschoolers approach normal growth, they use a higher proportion of incremental calories to increase activity rather than to increase growth (Beaton, 1982). Activity patterns may be a better yardstick for evaluating program effectiveness for mildly malnourished children.

Targeting also improves the cost effectiveness of direct nutrition interventions. The five supplementation programs examined here were not effective in significantly improving growth because, first, they were not targeted to areas with high rates of malnutrition and, second, the benefits provided may have been too small.

The selective use of supplemental feeding as part of a package of services in the Narangwal and Tamil Nadu programs enhanced the cost effectiveness of the projects. In Tamil Nadu, only about one in every three children was given food. Because food accounts for the major portion of the cost of the intervention, this is one way to minimize overall programs costs without decreasing effectiveness.

The dichotomy between subsidies as a family-oriented intervention and the IHN programs as a child-oriented strategy is an artificial division. Both the Tamil Nadu and Narangwal projects did involve the family. The growth monitoring and surveillance that was a large part of the effort in Narangwal created an awareness within the family of the health and nutritional status of the child. The project was very labor intensive. In the villages with supplementation, preschoolers had a total of fifty-five service contacts in a year (Kielmann, Taylor, and Parker, 1978). Similarly, in Tamil Nadu there was regular contact with the child and the family at the village centers. The requirement that families bring the child to the village center did not appear to affect participation (World Bank, 1984a). However, this might not be true if this type of intervention were replicated in parts of rural Africa where the target population may not be close to a village. The ease with which any type of intervention can be duplicated depends on the existing infrastructure. Modifications will always be necessary to accommodate local constraints (chapter 8).

It is unlikely that the selective distribution of food and the whole concept of food as medicine for the child would work without an intensive campaign within the project area. It is much more difficult to incorporate targeting of specific children into ongoing programs than into new ones.

The Philippine subsidy scheme and the two IHN projects were effective in improving child growth. However, the cost per child removed from moderate or severe malnutrition was lower in Tamil Nadu than in the Philippines. In the Philippines, the program subsidized all family members in

order to get to the preschoolers. In Tamil Nadu, food costs were incurred only for the child. If the only goal of a particular program is to alleviate preschooler malnutrition, the IHN approach is generally more cost effective than family food subsidies. However, policymakers are usually also interested in preventive strategies for addressing malnutrition. It is here that complementarities exist between family food subsidies and individually oriented IHN interventions. Targeting will improve the nutritional effectiveness of programs. Direct delivery of food—as in supplementation schemes and integrated health programs—should be used selectively.

10 Income-Augmenting Interventions and Food Self-Sufficiency for Enhancing Food Consumption among the Poor

SHLOMO REUTLINGER

Income-Augmenting Interventions

Most governments implement policies or programs, such as food subsidies, to augment the incomes of disadvantaged groups in the population. Some interventions, such as unemployment insurance and public works programs, are clearly targeted to benefit specific disadvantaged groups. Other interventions, such as regional development schemes or the distribution of subsidized inputs, are less well targeted in the sense that a share (sometimes a large share) of the benefits are conveyed to persons whose incomes are well above the poverty threshold. Finally, there are the general trade intervention policies designed to raise the incomes of all the producers of certain commodities (or holders of assets used in the production of the commodities).

Highly Targeted Interventions

The most obviously targeted income-augmenting interventions are public works programs, subsidy payments for selective increases in private employment and earnings, and cash transfer payments.

Subsidized public employment programs of various kinds are widely used to raise the purchasing power of those whose food supplies are chronically insecure. The major advantage of conveying income to the target population through payments for employment rather than through transfer payments is that the former generates physical infrastructure and can be self-targeting. This potential is realized, however, only if the wages paid for public employment are substantially below market wages. Otherwise, public employment schemes will attract more than just the target population.

The cost effectiveness of public employment schemes for conveying income to the target population depends on the marginal income conveyed and the subsidy component of the cost of the scheme. The marginal in-

come conveyed is the difference between the wages paid and the cost to the participants. These costs may consist of actual expenditures for traveling to and from the place of employment, the marginal cost of living away from home, and forgone income from private employment (for example, reduced food production or the substitution of purchased processed foods for home-processed foods). The subsidy component of the cost of the scheme consists of the difference between the value of the assets or public services generated and the cost of the scheme.

To illustrate how sensitive the cost effectiveness of public employment schemes can be to the choice of the program and the wage offered, assume that a public works scheme is initiated in a region in which a thousand households currently subsist on an average of $1.00 per day, and many other households have average earnings of $2.00 per day. Further assume that working on the project costs the participants $0.50 for traveling to and from work, additional food energy, and so forth. A wage of $1.50 would then be adequate to attract the target population and keep away other workers whose current income is $2.00 per day. If the value of a day's work performed under the scheme is $2.50 and its cost is $3.50 (for wages and materials), the public cost is $1.00. Clearly this scheme would be a cost effective way of augmenting the income of the target population. For each $1.00 spent on the scheme, the target population's income would be augmented by $1.00. If the value of a day's work performed would be $3.00, each $1.00 spent on the program would convey $2.00 to the target population.

Unfortunately, public employment schemes rarely achieve the cost effectiveness described in this illustration. The evidence suggests that assets created by public employment schemes are often limited. For instance, if the value of a day's work performed were to be reduced from $2.50 to $1.00, it would cost the state $2.50 for each $1.00 of income conveyed to the target population. Moreover, if the daily wage had been set at $2.50 instead of $1.50, the scheme would have attracted many workers from outside the target population; would have conveyed more income than intended to the target population; and would have increased the subsidy component in each day's work performed.

It is probably correct to say that few reports evaluating public employment schemes contain all the data needed to permit this kind of assessment. Clearly, if the cost of the scheme consists largely of the wage bill, chances are good that the income transfer efficiency is fairly high, even if the value of the work performed (the value of the assets created) is low. However, if the wages conveyed to the target population are not the largest part of the total cost of the scheme, an estimate of the economic value of the work performed is absolutely crucial for assessing the cost effectiveness of the project. Most assessment efforts provide little information about the

opportunity cost and other costs incurred by those employed in public works schemes.

The difficulty of identifying, designing, and implementing cost-effective public employment schemes is only one reason why it is difficult to effectively reach the target population. Another reason is that these schemes usually require large fiscal expenditures. Even in a cost-effective scheme, the fiscal cost of conveying income to the target population may be high because the assets or services produced by the scheme are public goods and therefore are not a source of revenue for the government. Thus the subsidy element of providing assistance through public employment may be low if measured in social costs but high in the financial outlay of the government.

Much less popular but perhaps a more promising alternative to public employment are public interventions to enhance private sector activity aimed at selective augmentation of the incomes of the target population. Such interventions take the form of explicit subsidies to private employment when those who are chronically food insecure derive their income from wage employment. Interventions in commodity pricing and infrastructural investments can be used to augment incomes of the self-employed.

What are some examples of public interventions aimed at promoting private employment? One is to provide protection for an industry in which the demand for labor is highly responsible to output prices. This requires that the demand for the product should be highly elastic and the production process labor intensive (for example, a labor-intensive export commodity). For protection to be a cost-effective vehicle for reaching the target population, the growth in demand for additional labor should translate into more employment for the unemployed or underemployed, as it clearly would if the supply of labor employed by the protected industry is highly elastic. Here only the conditions under which highly selective protection policies might become cost effective are indicated. An export subsidy on jute, cotton, or handicrafts may, under certain circumstances, make good food security sense. In general (depending on the nature of the labor market, the labor intensity of production processes, and the sizes of the international and national markets), export promotion policies are likely to be more cost-effective vehicles for promoting food security than import substitution policies.

Employment-generating policies are not limited to measures that affect the output mix. Research leading to the adoption of more labor-intensive technology and public infrastructure investments aimed at facilitating more private employment are other policy instruments. None of this is new, of course, and governments in many countries have long implemented a wide range of employment-promoting policies. But the interest

in food security mandates a rededication to the pursuit of cost-effective, employment-generating policies.

A wide range of opportunities for public intervention exists for augmenting the incomes of the self-employed. The target population is predominantly self-employed in many African countries, where a large share of the population live in rural areas and have access to agricultural land. However, self-employment both in and out of agriculture is also a predominant source of livelihood for at least some of the target population in most countries. Interventions for augmenting the incomes of the self-employed may be divided by whether they involve an efficiency loss. Interventions that have no loss in efficiency include the distribution of rationed amounts of inputs or the procurement of rationed amounts of products and the provision of access to public goods (such as roads, research, extension services, and education) that can be shown to have a positive social rate of return.

An example of an intervention that does not involve an efficiency loss is the supply of a rationed amount of fertilizer at below economic cost. For instance, if it can be shown that a farmer's gross income could be increased by more than $100 if he were to apply $100 worth of fertilizer, he could be supplied with this much fertilizer at half the cost. In this case, his net income would be augmented by $50, at a cost of $50 to the government. The same result could be achieved by providing him with half the amount of fertilizer at no charge. The latter approach is usually preferable, because the optimal level of fertilizer application (the point at which the marginal benefit equals the marginal cost) is difficult to predict and may be best left to the discretion of the farmer. If in the example the farmer applying $100 worth of fertilizer to his fields would have increased his gross income by only $50, the well-intentioned public intervention would have been completely ineffective and wasteful.

Another example of a cost-effective income transfer intervention is the delivery of infrastructure services that can be shown to yield benefits to users in excess of the cost incurred by the public. Under certain circumstances, recovering less than full cost from investment projects could be a deliberate policy rather than an unfortunate outcome. If this is the intention, it should be ascertained that at least a significant share of the unrecovered costs have augmented the incomes of the target population.

An example of an income-augmenting intervention that involves an efficiency loss is the supply of fertilizer to farmers at a subsidized price without restrictions on available quantities. In this case, the income gain to the farmer will assuredly be less than the social cost of the subsidy. Similarly, if infrastructural services are provided whose development costs exceed the economic benefits to the farmers, the income conveyed to them will be less than the cost of the intervention.

At this point it may well be appropriate to ask why not simply transfer cash income to the target population, particularly if the alternatives are relatively cost ineffective. Clearly this might be the case if the population resides in an area in which the agroclimatic conditions are extremely unfavorable. If a net increase of one dollar of income from farming costs two, three, or five dollars of investment in agricultural infrastructure or in public employment schemes, then cash transfer payments or programs that reduce the cost of living, such as supplying food at a low cost to the target population, may well be more cost effective.

Marketwide Interventions

Because it is often administratively difficult to reach the target population through selectively applied income-augmenting interventions, it is often tempting to implement policies that provide effective protection to all the producers of certain commodities through trade interventions that are more easily implemented and through public investment policies. Examples are subsidized prices for either imported or domestically produced fertilizer, import restrictions or taxation on the imports of agricultural commodities, subsidy payments for exports of agricultural commodities, and public investment programs in sectors that do not meet the criteria of economic return applied to other sectors.

As a general rule, these marketwide interventions are highly cost-ineffective vehicles for augmenting the incomes of the low-income households. The economic cost of many of these policies can often be far in excess of the income transferred to those households. Moreover, incomes of better-off farmers are often proportionately increased more than the incomes of the target population. Similarly, tenant farmers are not likely to reap any benefits, because these accrue to the owners of the land in the form of higher rents—or in the form of higher land values if they choose to sell their farms. Finally, low-income households whose incomes are not augmented could be adversely affected if these policies raise prices of commodities that are important items in their consumption basket or of inputs they require to earn their livelihood.

The Intrinsic Value of Food Self-Sufficiency

Much criticism has been leveled at policies of developing countries that discriminate against their self-sufficiency in food supplies. Low food consumption is presumed to be one of several undesirable consequences of these discriminating policies. It is therefore reasonable to ask whether increasing the rate of self-sufficiency in food supply rather than food price

subsidies and other income-augmenting interventions would not be a more appropriate response to the concern for inadequate food consumption.[1]

To examine the relation between self-sufficiency in food supply and food consumption, it is desirable to distinguish between the income-mediated effect and the intrinsic supply effect. There is much empirical evidence to support the contention that food consumption is positively correlated with income. There can be little argument, therefore, that raising the level of food self-sufficiency is good food security policy when it leads to higher incomes among the poor. The question is whether food self-sufficiency strategies should be pursued even when they do not raise incomes. That is, does food self-sufficiency have intrinsic value? If yes, it might be more sensible in particular circumstances to subsidize interventions that promote food self-sufficiency instead of reduced food prices. If the rate of self-sufficiency has no intrinsic effect on food consumption, subsidizing its promotion is not an alternative.

One way of measuring the intrinsic value of the self-sufficiency ratio in the food supply is to observe food prices in different countries. A positive effect could be plausibly inferred if self-sufficiency were found to be negatively correlated with food prices. However, food price data are either not available or are not measured in comparable ways. Moreover, the relation between food consumption and food prices is ambiguous in countries where a large share of the population are food producers as well as consumers.

A more promising approach for assessing the intrinsic value of self-sufficiency in the national food supply, therefore, is to study its direct effects on food consumption. Specifically, the question to be addressed is whether variations in consumption or the rate of growth in consumption among countries are partially explained by variations in the self-sufficiency ratio of the national food supply or by the rate of growth of this ratio, respectively.

In making such an assessment, the energy content of per capita food consumption can be used as an approximate indicator of the adequacy of food consumption throughout the country's population. It is clearly only an approximation, because variations in the interpersonal distribution of consumption are not explicitly taken into account. Yet there is some evidence that variations in the energy content of the per capita diet explain as much as 80 to 90 percent of variations in the prevalence of energy-deficient diets (World Bank, 1986). This is of course because differences in the energy content of the diets of the poor and the rich are relatively small and

1. Whether it is desirable to subsidize an increase in the food supply at the national or the local level is an entirely separate issue, which has been extensively discussed in previous chapters. Here, the share of domestically produced food in the total supply is the only concern.

differences in the income distribution among countries and over time are not very large.

Statistical analysis of data from fifty-five developing countries provides strong evidence that variations of the self-sufficiency ratio in the national food supply does not explain variations in the energy content of national diets. For the purposes of this analysis, self-sufficiency in the supply of cereals was used as a proxy for self-sufficiency in food supply, and only countries in which energy from cereals is in excess of 40 percent of energy in the diet were included. Furthermore, the statistical analysis was performed on five-year averages of the data to reduce the effect of annual stock changes.

The results from multiple regression analysis across groups of countries are shown in table 10.1. Per capita income has clearly a statistically significant effect on the energy content of the national diet. Self-sufficiency in cereal supply, however, is seen to contribute little or nothing to the explanation of variations in the energy content of national diets. The empirical observation that cereal self-sufficiency has little, if any, effect on per capita food consumption is corroborated by a statistical analysis of ten-year trends in consumption and the self-sufficiency ratio across the same developing countries. Regression results are shown in table 10.2. Whereas trends in per capita income, energy in the initial diet relative to the re-

TABLE 10.1 Estimating equations of energy content in per capita national diet across developing countries, 1976-1980

Region	Income Elasticity (b_1)	Self-Sufficiency Elasticity (b_2)	R^2
All countries (N = 52)	0.14	0.005	0.61
	(8.5)	(0.2)	
Africa (N = 21)	0.13	0.001	0.50
	(4.3)	(0.1)	
Asia (N = 11)	0.17	−0.039	0.75
	(3.9)	(−0.5)	
Latin America/Caribbean	0.18	0.010	0.51
(N = 11)	(2.7)	(0.3)	
Middle East/North Africa	0.19	0.110	0.74
(N = 9)	(4.0)	(1.6)	

NOTE: The estimating equation is

$$\log Y = b_0 + b_1 \log X_1 + b_2 \log X_2,$$

where Y is the energy in the per capita daily diet, X_1 is per capita income (purchasing power parity), and X_2 is the self-sufficiency ratio in cereals supply. Only fifty-two countries in which food energy from cereals provide in excess of 40 percent of total energy in the diet are included. t-values are in parentheses.

TABLE 10.2 Relation between growth rate in energy content of per capita diet and growth rates in per capita income and self-sufficiency ratio of cereal supplies, 1970–1980

Equation	b_1	b_2	b_3	b_4	R^2
Equation 1	0.18				0.40
	(6.0)				
Equation 2	−0.82	−0.74	0.00004		0.55
	(3.6)	(−3.0)	(3.2)		
Equation 3	−0.84	−0.75	0.00004	0.018	0.57
	(3.6)	(−3.1)	(3.2)	(1.4)	

NOTES: The equations are

Equation 1 $$Y = b_0 X_1^{(b_1)}.$$

Equation 2 $$Y = b_0 X_1^{(b_1 + b_2 X_2 + b_3 X_3)}.$$

Equation 3 $$Y = b_0 X_1^{(b_1 + b_2 X_2 + b_3 X_3)} X_4^{(b_4)}.$$

where Y_1 = growth rate of energy in daily per capita diet, 1970–80; X_1 = growth rate of per capita income, 1970–80; X_2 = ratio of energy consumption to requirements, 1969/71 average; X_3 = gross domestic product valued at purchasing power parity exchange rates, 1969/71 average; and X_4 = growth rate in self-sufficiency ratio of cereal supply, 1970–80. Only fifty-two countries in which food energy from cereals provide in excess of 40 percent of total energy in the diet are included. t-values are in parentheses.

quirement, and income level of the country contribute to explaining the trends in per capita food energy consumption, the trend in the cereal self-sufficiency ratio did not have a statistically significant effect.

Conclusions

This chapter briefly explores the role of possible alternative income-augmenting and supply-side interventions for increasing poor households' access to food. Interventions have been defined as policies or programs that involve a trade-off between economic growth and improved nutritional well-being of the population, at least in the short run. Whether they also involve a trade-off in the long run is another question, which can be addressed only by knowing the investment implications of trading off human capital for other forms of capital. In this context, income-augmenting interventions must be judged by the amount of income being transferred to the target population relative to both the fiscal and economic costs of the interventions.

In general, the income transfer efficiency of marketwide or implicit income-augmenting interventions is likely to be low, because it is difficult to reach the target population without conveying perhaps a lion's share of benefits to nontarget households. Whether the income transfer efficiency

is lower than that in other interventions depends, of course, on the availability of viable alternatives. The income transfer efficiency of highly targeted transfer payments (in kind or in cash) may also be very low if it is difficult to identify and maintain a list of eligible beneficiaries. Yet if the alternative is excessive rural to urban migration, the income-augmenting interventions discussed in this chapter may still be more cost effective than having to provide urban infrastructure and urban income maintenance interventions (say, through the distribution of subsidized food rations) when urban employment opportunities are severely constrained.

Raising the level of self-sufficiency in the national food supply, if it does not lead to higher income among the poor, has been shown to be ineffective. If a higher rate of self-sufficiency comes at the cost of reducing the incomes of low-income households, the effect is likely to be negative.

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PART III

Results from Country Studies

11 Food Subsidies in Egypt: Benefit Distribution and Nutritional Effects

HAROLD ALDERMAN

On almost any street corner in Cairo one can buy a *tamaya* or *falafel* sandwich for a few cents. This daily fare is a microcosm of the government's involvement in food pricing. The fava beans in the sandwich are subsidized. The oil in which they are fried is subsidized. The bread is subsidized. The tea one might have with the sandwich is subsidized, as is the sugar used to sweeten it. Furthermore, the sandwich will probably be wrapped in a newspaper that is likely to contain a speech or an editorial on the subsidy system.

The Egyptian government and the population at large are not unaware of the costs of the system. Speakers frequently say that the annual outlay for food subsidies—more than 1.6 billion Egyptian pounds (£E 1 = U.S. $1.22) in 1981/82—exceeds the annual profits from the Suez Canal. The economic costs, as opposed to the fiscal costs, are not as widely known, yet economists and planners are aware of the relation of the overall deficit to inflation and exchange rates. Furthermore, they note with alarm the stagnation of agriculture and the growing dependence on food imports, which can be attributed at least in part to the food pricing system (Scobie, 1983, 1984; von Braun and de Haen, 1983). What, then, are the benefits for which these costs are incurred?

In part, they are political. The commitment to food subsidies represents a social contract, the significance of which goes beyond the value of the goods involved. This study, however, will concentrate on the implicit income transfer embodied in the various commodities handled by the government and the characteristics of the distribution of principal goods. Because many commodities are available at a range of prices depending upon the outlet (Alderman, von Braun, and Sakr, 1982), the benefits of the system will be depicted in terms of the various outlets and marketing channels, which are in effect the instruments for implementing and modifying food policy.

Implicit Income Transfers

Ration System

The formal rationing system is not the largest component of the subsidy bill, but it is the most widespread. Virtually the entire population—about 92 percent of all households—have ration cards that guarantee a monthly quota of sugar, tea, oil, and rice at a low subsidized price and an additional quota of these goods at another higher and generally subsidized price.[1] In addition, card holders can purchase monthly allotments of lentils and beans, although the availability of these is seasonal and less assured. Even families who were not eligible for the lower priced rations in 1982 were entitled to a card that gave access to commodities at the second tier of subsidized prices. Distributed through licensed private grocers, the subsidized goods are regularly available in nearly all villages and urban neighborhoods. The government's supply authority then serves as a wholesaler of principal staple commodities. This reflects an initial goal of the system to provide regular and equitable access to scarce commodities with quantity rather than price mechanisms determining distribution.

In addition to this ration system, consumers can purchase goods from a network of cooperatives and state-owned retail outlets, also called cooperatives. Membership is not required for purchase, nor do official quotas exist on monthly purchases. Furthermore, open-market private trade is permitted.

For most families, the goods available through the ration system are inframarginal; the majority of families make additional purchases at cooperatives or on the open market. For example, whereas less than 2 percent of either the urban or the rural households surveyed reported that they declined some of the sugar ration, 76 percent of the urban and 79 percent of the rural families purchased amounts above the ration. Similarly, 55 percent of urban dwellers and 51 percent of rural households purchased additional amounts of rice, while less than 4 percent of either group declined the ration.

Although the proportion of consumers who purchase additional amounts of goods that are also available in the ration shops is roughly the same in rural and urban regions, the share that comes from the cooperative system is regionally determined. Urban residents obtain most of their additional purchases of sugar, oil, and lentils from the cooperatives, whereas the bulk of their purchases of rice, tea, and beans come from the open market.

Rations, then, can be viewed as augmenting consumption through an income transfer rather than influencing the amount consumed by lowering

1. Except where noted, all household statistics in this chapter are based on a survey of 1,390 rural and 980 urban households undertaken by IFPRI and the Egyptian Institute for National Planning in 1981 and 1982 (Alderman and von Braun, 1984).

the marginal price. The implicit income transfer can be calculated as the difference between a reference opportunity cost, in this study taken as the cost, insurance, freight (c.i.f.) price of the commodity evaluated at the official exchange rate and the various rationed prices. This difference was multiplied by the respective ration amounts actually received. When income transfer is calculated in this manner, one sees that the average rural resident received a transfer of £E 6.7 in 1982, while an urban resident received £E 8.7. The difference between the two sectors comes mainly from differences in quotas for oil and rice. There is a slight tendency for the absolute value of the transfer to decline with income. The analysis also indicates that larger families had smaller income transfers per person, which was mainly because some commodities are distributed by household rather than by individual quotas. Benefits measured in percentage of total household incomes declined markedly with increased income; the ration transfer for the lowest rural expenditure quartile was 8 percent of their total expenditures, whereas it was only 1 percent for the highest rural expenditure quartile. A similar pattern was observed in the urban sector.

Cross-sectional regressions indicate that increases in ration availability and quotas lead to statistically significant decreases of purchase of the goods from other sources. However, for most goods the reduction was less than the increase resulting from the ration and the accompanying income transfer. This indicates that the ration has a small but measurable effect on consumption that is not predicted by income transfer alone.

Bread and Flour

The commodity group that represents the largest outlay for the government is wheat bread and flour. Consumers may obtain subsidized wheat products as 72 percent or 82 percent extraction flours or as bread made from these flours. The government licenses bakeries and regulates the size, moisture content, and price of the breads. The average urban resident purchases nearly three loaves of bread a day compared to less than a half a loaf daily for rural residents. This apparent disparity is misleading, however, for nearly all rural residents bake at home whereas only a quarter of the urban residents do so. The rural population obtains more than twice as much subsidized flour per capita directly from government channels than the urban population. The annual value of the transfer in bread and flour from licensed outlets that went directly to consumers came to more than £E 600 million in 1981/82. Of this, nearly half went to the rural sector. An additional amount went to consumers through restaurants and sandwich shops.

In addition to bread and flour obtained from government channels, one must consider flour obtained on the open market, which accounted for nearly half of all the flour purchased in the rural area. Much of this flour

was originally imported and sold at subsidized prices at government shops and then resold by individuals at a slight markup. This is a legitimate means by which consumers in villages without flour shops or without the means to purchase a 100-kilogram sack obtain this commodity. In addition, open-market sales consist of flour milled from domestically grown wheat, the bulk of which is traded on the open market. Nevertheless, from evidence obtained from the household survey conducted in 1981/82 by IFPRI and the Institute of National Planning, it appears that a majority of open-market flour sales were at one stage in the marketing network handled by the government and therefore indirectly subsidized. When this is taken into consideration, there does not appear to be any urban bias in the subsidy on wheat and bread. Urban residents obtain an annual transfer of £E 17 per capita from these products, while rural residents obtain more than £E 12 directly from government channels and an additional £E 5 or 6 through the open-market channels.

Although no limits on individual purchases of bread or flour are set by the central government, rural districts can and frequently do limit monthly purchases of flour. This is particularly the case during festival periods, when there is a possibility of demand exceeding local supply. Such temporary limits influence purchases, hence total transfers. Similarly, the distribution of outlets affects purchases. Although rural residents without a flour shop in their own village often purchase flour from government outlets in neighboring villages, they are less likely to make such a purchase than households with a local flour shop. Interestingly, when they do make a flour purchase, it is larger than that of others but not sufficiently so as to offset the smaller frequency. The net effect of such institutional factors is in favor of the southern districts, where the density of flour shops is greatest and in favor of small families, as temporary purchase quotas are frequently per family rather than per individual. On a regional level, the government markets greater quantities of grain in districts where local production is less; hence, it evens out domestic consumption.

Quotas and shortages are both sporadic and local, and therefore the implicit transfer from flour subsidies is determined mainly by the household demand for bread and flour—which is determined largely by income. The absolute value of the transfer can be shown to be significantly and positively related to income in multivariate regressions, but, as with the ration system, the relative share as a proportion of the total expenditures declines with income. However, not every flour product is consumed in greater quantities by upper-income groups. Income elasticity is negative in urban areas for *balady* flour and bread (82 percent extraction) and virtually zero in rural areas for *balady* bread, indicating that *balady* bread and flour are inferior goods. This is not the case for 72-percent-extraction flour or the *fino* and *shamy* breads made from it. Given this pattern of distribu-

tion of benefits, and that refined bread and flours provide less than a quarter of total urban flour consumption and only 10 percent of rural consumption, there appears to be some potential for reducing the fiscal cost of the subsidy bill by reducing the subsidy on the refined products. Although regression results support this view, there is some evidence that appreciable cross-price effects would moderate the effect of an isolated change of refined flour prices.

Cooperatives

In rural areas, cooperatives provide only a small share of any of these goods. Consequently, the transfers obtained by rural residents from cooperatives are only one-tenth of those obtained by urban residents. The average urban resident received a transfer of approximately £E 8 annually through the subsidized cooperative system, about half of which was embodied in purchases of frozen meat, poultry, and fish. Residents of Cairo and Alexandria are not particularly favored by staples from cooperatives but do obtain a significantly greater amount of the frozen goods, as do members of cooperatives established at work places, usually government offices or public sector enterprises.

A principal difference between items available at the cooperatives and those from the ration system is that there are no assured supplies at the cooperatives. Although a family is not limited in the monthly purchase of staple commodities, the cooperatives do have monthly quotas that are frequently less than the quantity that consumers would want to purchase at the fixed price. For this reason, lines form at the outlets—not because distribution is slow but because goods are allocated on a first-come, first-served basis. Those who arrive early gain priority rights to the goods. Late arrivals risk being confronted with empty shelves and the necessity to wait until the next shipment or to pay a higher price for the good on the open market.

Such distribution by willingness to wait might be expected to benefit the poor, who may be assumed to have lower opportunity costs for waiting in line, that is, to value less the alternative use of a unit of time (Barzel, 1974; Nichols, Smolensky, and Tideman, 1971). The available data, however, do not support the hypothesis that the poor can be targeted through their willingness to wait. For example, the ratio of cooperative purchases to open-market purchases is no higher for the poor than for the general population, as would be expected if the poor were more prone to use that outlet. This is also indicated by multivariate regressions that measure the response to waiting time in a manner analogous to price responses. The analysis shows that the longer the waiting time, the less likely an individual was to shop at the cooperative and the more likely to purchase that good on the open market. The poor, however, were as likely to leave the cooperative

market if waiting times increased as was the rest of the population; indeed, in some cases, they were more likely. The explanation for this pattern seems to come from the nature of the distribution; limits are seldom placed on the amounts purchased per visit at cooperatives. Hence, the rich who purchase a larger bundle obtain a greater benefit from standing in line. This greater benefit offsets any possible difference in the opportunity cost for waiting.

The pattern of purchases and the response to waiting times for frozen meat, chicken, and fish are similar to those for staples from the cooperative. In principle, there is a monthly limit on the amount of frozen poultry and meat that a family can obtain, although this is not an assured ration. A strong relation observed between income and frozen chicken purchases, however, indicates that this regulation is frequently not enforced. Unlike chicken, more frozen fish and meat were consumed by the poor than by the higher expenditure quartile, although none of the frozen commodities were widely purchased. Less than a third of the urban population obtains frozen chicken in any given month, with the percentage of families purchasing, as opposed to the quantity bought, declining with income. A similar pattern was observed with frozen fish, whereas less than a quarter of the population obtained frozen meat. Less than 3 percent of the rural population obtained either frozen chicken or meat, but 11 percent were able to procure frozen fish.

Two other forms of direct subsidies contributed to the subsidy bill. The principal one, yellow maize, which added more than £E 150 million to the subsidy bill in 1981/82, however, is actually an input in livestock production. Whereas more than 26 percent of this maize goes to rural households through the cooperatives and is listed for human consumption, virtually all of it is used as chicken feed. The rest of the yellow maize goes to large-scale poultry farms, feed processing, and starch manufacture. The distribution of subsidized yellow maize is the most regressive of all foods. The poorest rural quartile obtained only 14 percent of the maize distributed by the cooperatives, although they purchased 25 percent of the yellow maize sold on the open market. Maize through the latter market channel costs up to twice the subsidized price, although all yellow maize in Egypt is imported and subsidized at some point in the distribution network. Yellow maize is also a major input for prepared cattle feed, much of which is distributed at subsidized prices in the agricultural cooperatives. The poorest quartile obtains only 7 percent of this commodity. Again, this is not because their demand is saturated, as evidenced by the larger share of more expensive open-market sales of feed they purchase.

Another subsidized item using imported wheat flour is pasta, whose subsidy accounts for more than £E 60 million annually. The income elasticity for this commodity is larger than for any other subsidized food com-

modity, with the exception of frozen chicken. This indicates that the subsidy is not targeted to the poor.

Open-Market Purchases

Although consumers benefit from subsidies on foods directly or indirectly handled by the government, a broader picture is obtained when one looks at open-market purchases. The local price of some open-market commodities are below the c.i.f. price for the good, and therefore the consumer receives an implicit subsidy when purchasing the goods. Open-market purchases of flour and cereals fall in this category. For other commodities—notably domestically produced milk and meat products but occasionally sugar, oil, beans, and lentils as well—the open-market price exceeds the import opportunity cost for goods. Consumers are indirectly taxed by import and trade restrictions on these goods. The regional and seasonal pattern of rice supply is such that it occasionally falls in the protected category, although more often the local price is below the potential export price. As upper-income groups purchase more of the protected meat and dairy products, they pay the bulk of the premium attributed to the distorted prices for these goods. The principal beneficiaries of such a price system are the producers of meat and dairy products as well as the producers of clover, the main cattle feed. The government seldom directly captures the implicit tax on locally protected goods, except when the import price falls below the cooperative price. As discussed in chapter 13, this transfer from predominantly urban middle-class meat consumers is distributed throughout the rural sector and partly offsets the implicit taxation on other agricultural commodities, particularly cotton and rice.

Netting all these components—gains and losses from government channels, open-market purchases, and production—one finds that the price system taken as a whole favors the rural community and the urban poor, although some of the components do not (see table 11.1).

One notes, for example, that the rural poor gain nearly £E 19 annually from government channels and an additional £E 6 from open-market purchases of cereals but lose £E 5 on other open-market purchases. In addition, they have a net loss of £E 1 from distorted prices in agriculture. Their average per capita gain from the pricing system, then, comes to £E 19, which is slightly higher than the average gain for the rural sector taken as a whole and exceeds the net gain of £E 13 for the urban sector. This average gain in the cities included a relatively large gain of £E 22 transferred to the poorest quartile and an imputed loss of £E 4 for the richest quartile, whose losses on open-market purchases of animal products exceeded their sizable gains from subsidies and distortions in other market channels.

TABLE 11.1 Income transfer from food subsidies and distorted prices, Egypt, 1981/82 (£E per capita per year)

Source of Transfer	Urban			Rural		
	Lowest Expenditure Quartile	25-75 Percent	Upper Expenditure Quartile	Lowest Expenditure Quartile	25-75 Percent	Upper Expenditure Quartile
Government channels	27.55	29.61	31.22	18.76	18.21	23.66
Open-market cereals	0.71	2.62	1.34	6.58	11.62	19.30
Other open-market goods	−5.91	−14.85	−36.57	−5.26	−8.65	−17.59
Animal production				4.19	7.67	13.43
Other agriculture				−5.29	−9.64	−20.25
Total	22.34	17.58	−4.01	18.98	19.21	18.47
Total as percent of annual expenditures	12.86	4.66	−0.40	16.89	8.68	3.53

SOURCE: Data from the household survey made by the International Food Policy Research Institute and the Institute of National Planning, Cairo, 1981/82.

Nutritional Concerns

The government's involvement in food distribution, then, contributes a significant portion to the purchasing power of the poor throughout the country. The low prices for major food items undoubtedly contribute to the high food intake in Egypt, intakes that exceed those of virtually every other developing country. The lowest expenditure quartiles in both the urban and rural sectors consume more than 2,300 calories on the average, and the entire population reported an average of more than 2,600 calories consumed in the previous day's meals. Slightly higher results are obtained if average calories are estimated from food purchases. Protein intake is similarly high; even when corrected for amino acid composition in all quartiles, the average intake exceeded the per capita requirement for the average family by at least 25 percent.

Flour and bread are the principal sources of both calories and protein for all income groups. In rural areas, maize, coarse grains, and rice contribute about a quarter of the calories provided by flour and bread in the diet. In urban areas, sugar's contribution to calories exceeds that from rice. It is significant that the ration system contributes an appreciable share of calories to the overall diet, but because these are mainly from sugar and oil, the ration system is not a major source of protein. Nor is the cooperative. This is true despite the role the cooperatives play in distributing frozen imported meat and fish. Current high levels of protein intake would continue even if the contribution to the diet provided by all items from the cooperative were not included in the totals, indicating that there is little justification on nutritional grounds for the subsidy on frozen imported meat and fish.

This point is underscored when protein intakes are adjusted to derive amino acid composition. There is no human biological need for "animal protein" per se. Indeed, protein is not absorbed in digestion. What is required are amino acids, which are the building blocks of protein. These can be assembled to form human proteins only if they are present in the relative proportions of the human body. Otherwise, excess amino acids are used as an energy source rather than as a building block. Although the proportion of amino acids in animal products most resembles that in humans, the average diet in Egypt is sufficiently diverse that the amino acids lacking in one food item are likely to be present in another consumed at the same meal. The twenty-four-hour food recall included in the household survey allowed for the calculation of such proportions. The results indicate no protein quality problem in the Egyptian diet.

In calculating the percentage of families that do not obtain sufficient food to meet family requirements, one has to account for both sample variation of recorded intakes and the biological variation of human requirements. As protein requirements are believed to be normally distributed in

a population, with individuals having little latitude for influencing their requirements, it is possible to make a statement about the probability that any observed intake falls below requirements. Accordingly, the requirements used for this study were determined by the average requirement for a given age and sex plus two standard deviations. The actual requirements of 97.5 percent of the population will be below this point. Furthermore, observed intakes were revised downward to adjust for digestibility.

Calorie requirements differ from protein requirements in that an individual can influence calorie requirements by changing his or her activity level. Consequently, one must determine a norm for activity in order to discuss requirements. In this study, moderate activity is assumed, with a 15 percent reduction of calorie needs to accommodate variation of requirements among individuals as well as any costless adjustments of behavior (Beaton, 1983). Using these criteria, one finds that 17.4 percent of the urban and 16.3 percent of the rural households obtained fewer calories than their adjusted requirements. Protein-deficient households comprised only 4.7 percent of the urban sample and 8 percent of the rural sample. It is important to note, however, that virtually no household was found to be protein deficient that was not also calorie deficient. This underscores the view that there is no need for a specific protein policy distinct from other elements of an overall food policy.

A portion of the apparent nutrient deficiencies may reflect measurement error and family differences not related to purchasing power or prices. This view is supported by the appreciable percentage of upper-income groups that appear deficient. If one attributes this level to "background noise" and subtracts it from the calculated level of deficiencies for all quartiles, the urban calorie-deficient population is reduced to 10.4 percent and the rural to 11.4 percent. As expected, the bulk of the calorie-deficient population is in the poorest quartile, representing 24.0 percent of the urban poor and 32.8 percent of the rural poor.

The statistical relation between income and the probability of a calorie or protein deficit was revealed by a probit regression analysis. Income is highly significant in explaining observed family calorie and protein deficits, with rural income increases more likely to decrease the probability of a deficit. An increase of £E 5 in monthly per capita income will reduce the probability of a calorie deficit by 0.01 (mean = 0.17) in urban areas, whereas an increase of £E 1.5 would achieve the same reduction in rural areas. It is unlikely that such a pattern is generated by random variation in requirements; it probably reflects pockets of undernutrition that persist despite high overall food consumption. These pockets are more likely to occur among urban dwellers in Cairo or Alexandria and among rural dwellers in Upper Egypt in the case of calorie deficiency.

At the same per capita income levels, households headed by females are less likely to have low calorie intakes if they live in cities, and families with larger percentages of children are less likely to have a calorie deficit. The family requirements are based on the age distribution in the family; therefore, families with more children have lower overall requirements. There is no way to determine from these data whether the children themselves are more or less likely to consume the required amount of calories.

In cities, ration card holders are more likely to meet their calorie requirements, whereas there is no statistical difference in rural areas. Because the ration system provides only a moderate share of total calories and because families without the card can shop for these goods at the cooperative or on the open market, this is a puzzling observation. It probably reflects both the demographics of families without cards (frequently newlyweds) and market imperfections.

A probit regression was also used to ascertain the relation between having had a child less than five years old die in the previous year and calorie and protein inadequacy. Although 7.5 percent of the rural families surveyed reported such an occurrence—which is alarming when one considers that many families had no children in this age bracket—no statistical relation with either income (negative correlation but not significant) or dietary inadequacy was observed. The pattern of distribution of food among family members and the quality of health care delivery are more important predictors of child mortality than family food consumption. Moderately high levels of stunting and wasting have been observed in Egypt (Egypt, 1978).

The relation of income and calorie deficiencies reported above as well as the moderately high income elasticities for calories in Egypt (about 0.2 overall and nearly 0.4 for the poorest quartile) are evidence that the calorie-deficit population would increase if the current income transfers and price subsidies were removed. Improvements in current high mortality rates or a decrease in the number of children with clinical signs of malnutrition, however, are more likely to be achieved by improvements in health care and sanitation than by any increases in food subsidies or other consumer-oriented food policies.

Summary and Policy Implications

The functioning of the ration system indicates that it is possible for a government serving as an importer and principal wholesaler of basic staples to achieve a uniform and uninterrupted distribution of goods. The use of private traders as the ultimate distributors of rations does not subvert the goal of equitable access to goods, despite fluctuating and occasion-

ally scarce supplies; it may even account for much of the distributional efficiency.

The existence of rations within a multitiered marketing system has only a slight effect on consumption levels, but it has a significant effect on income. This income transfer, or negative tax, is untargeted, but it reduces the relative inequality of income by giving higher proportional shares to the poor. Although such a transfer could also be achieved by a food stamp scheme or a direct income transfer, policing such a system may involve administrative costs similar to or greater than guaranteeing the quotas.

Although the ration system in Egypt does not determine the household marginal purchase of basic commodities and, therefore, probably does not contribute to allocative inefficiencies or deadweight loss, the same cannot be said for other forms of government marketing. Rigid prices lead to local disequilibria, and consumers gain access to goods by their willingness to wait at the cooperative. They allocate a resource—time—but neither the government nor any member of the economy receives this resource as payment. Raising the price of goods sold at cooperatives to the level of the current cash costs plus time allocation should not appreciably change market-clearing quantities, yet it would gain more revenues for the government. The current means of allocation by willingness to wait does not target the poor. It is possible to increase the effectiveness of such targeting by limiting the size of purchase that can be made per visit. This, however, would increase deadweight loss to the economy as well as the real costs to many households.

The tendency to reduce government costs by changing local quotas rather than by raising prices also leads to higher open-market prices in some regions than otherwise would be the case. The effects on distribution differ by commodity but may be different from those intended. This may be particularly true for agricultural inputs, including maize for feed.

Finally, low prices for wheat and flour have an appreciable effect both by increasing real income and by lowering marginal prices. Unlike rations, this probably increases total consumption appreciably. The government can influence consumption somewhat through licensing and placement of outlets, but not much. A policy of price differentials or quotas for items like bread and flour of different qualities will also cause consumption of other goods to change in a manner that may reduce the net fiscal savings from the price change. This stresses the importance of considering substitution in assessing and redesigning existing policies.

12 Food Subsidies in Egypt: Implications for the Agricultural Sector

JOACHIM VON BRAUN

Food subsidies affect various sectors of the Egyptian economy, but their influence on agriculture, which employs a considerable share of the nation's resources, seems particularly strong (von Braun and de Haen, 1983). A major objective of this research was to analyze the agricultural policy-making in the environment of a large and growing food subsidy system. Inefficiencies and misallocation of resources in agriculture arising from food subsidies are hidden costs of such systems. However, it is crucial to separate out from the whole bundle of policy goals and related instruments those that are directly or indirectly linked to food subsidies. The basis for this can be provided only by a complete quantitative assessment of a country's agricultural policy and its determinants.

Those commodities that are strictly rationed at fixed prices on the food distribution side are also strictly controlled on the production side. Rice, pulses, and sugar are examples. Nonrationed or not strictly rationed commodities like wheat, maize, sorghum, and meat have experienced considerably less interference in allocation and marketing. Agricultural input and output prices are distorted in different ways: whereas field crops are usually taxed, the production of meat and milk has typically been protected by import restrictions and by the supply of subsidized feed. The special situation for feed and livestock indicates that food policy may cause a consumer-to-producer transfer and even a producer-to-producer transfer, which accompanies redistribution of incomes among the production sectors within agriculture.

The following assessment of the effects of food subsidies on agriculture takes account of specific linkages and policy mechanisms. The effects on production of procurement, price fixing, area allotment, and the competition for scarce public funds have been considered. A distinction has been made between those markets where subsidized and rationed commodities are released from government outlets and so-called open or free markets, where transactions of food commodities are uncontrolled (von

Braun and de Haen, 1983). The sector analysis is supplemented by micro farm studies, which examine the intrasectoral income distribution effects of food subsidies and price distortions for different types of farm households and assess farm households' behavior toward the subsidized food distribution, that is, their response in production, marketing, and consumption of cereals (Alderman and von Braun, 1984).

Food Subsidies and Public Spending on Agriculture

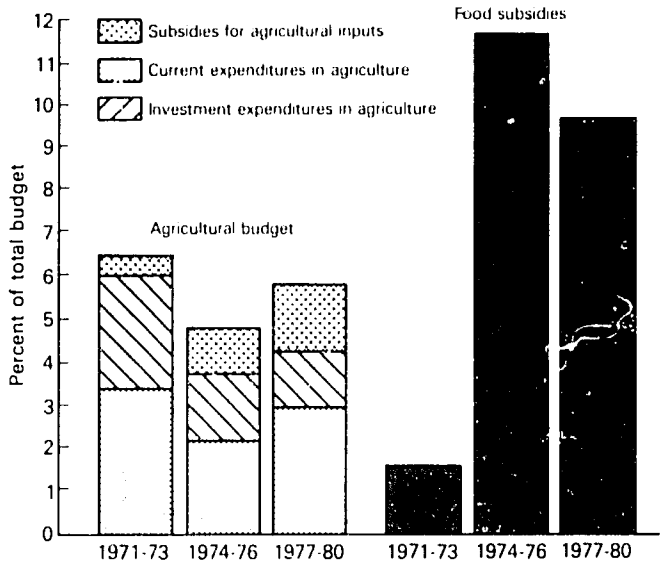
Since 1973, food subsidies, which were negligible in the 1960s, have accounted for 7 to 15 percent of total public expenditures. The additional drain on the budget in the 1970s had repercussions on other expenditures, as these subsidies were not entirely financed by increased revenues or deficit spending. How was public spending on agriculture affected, including agricultural investment and research and development efforts?

The agricultural budget, which had been steadily declining between the mid-1960s and 1974, has grown in real terms since then. The rise in public expenditures in the mid-1970s reflects release from the war burden and a reshuffling of the economy toward a more open and privately oriented system. Gross domestic product in real terms grew twice as fast during 1972–80 than during 1965–72 (7.3 percent versus 3.7 percent).

The agricultural budget has undergone far-reaching structural changes. Input subsidies, mainly for fertilizer and pesticides, became a major component of the budget in the 1970s, whereas these commodities were slightly taxed in the 1960s. Other current expenditures were stable in real terms, but their share decreased because expenditures on investment and agricultural input subsidies grew. Input subsidies increased, as did food subsidies. Clearly, in terms of domestic currency, when import prices rose and uncontrolled domestic prices were inflated, the government attempted to stabilize both controlled consumer prices and agricultural input prices.

To a degree, the agricultural budget (investment and current expenditures) was forced to play the role of a fund of last resort. However, if subsidies for agricultural inputs, which parallel consumer subsidies on food, are included, the gross fiscal support of agriculture is not reduced relative to rising food subsidies (figure 12.1). In the last years of the 1970s and the early 1980s, fiscal support of agriculture began to be restructured, with a stronger focus on investment in land improvement, research, and development. But public investment in the sector remains small: only 9 percent goes to agriculture, which still provides about half of the country's employment and 20 percent of national income. More is spent on food subsidies than on the agricultural sector (figure 12.1).

FIGURE 12.1 Shares of food subsidies and agriculture in the total Egyptian budget, 1971-80



SOURCE: Von Braun and de Haen, 1983.

Relation of Food Subsidies to Government Interventions in Agriculture

In analyzing the effects of price and market intervention policies on agricultural income, on producer and consumer welfare, and on the government budget, this market analysis by commodity provides the groundwork for a final policy evaluation in which the relation between agricultural taxation (the "burden on agriculture") and food subsidies is assessed. All major agricultural commodities are included in the analysis (von Braun and de Haen, 1983).

Effects of Price Policy on Cereals Markets

The three major cereals produced in Egypt—wheat, rice, and maize—are affected in different ways by agricultural policy, and their market structures do not have much in common. The producer prices of all three, especially wheat and rice, are kept below international prices. The government procures rice and wheat but not maize. Whereas procurement for rice is compulsory, with a quota per unit of land, a similar regulation for wheat was virtually phased out in 1977. Imports of wheat and maize are distributed at subsidized prices, but the former is channeled to consumers

while the latter goes mainly to livestock producers. Egypt's domestic wheat production covered about 20 percent of total consumption in 1982.

Domestic prices are depressed below their international equivalents, which places a burden on wheat producers. This burden may be split into three sources: procurement, depression of the free market, and inefficiency in the allocation of resources for production, which is usually referred to as net social loss in production. Consumers gain from the subsidy on wheat flour and bread, but they also gain from the reduction in open-market prices net of the misallocation to consumption. Most of these gains are covered by government subsidies on wheat imports or procured domestic wheat, and part is indirectly financed by wheat producers.

Subsidized fixed consumer prices ranged from 28 to 58 percent of the international wheat price during 1965–80, and were slightly higher than government procurement prices during the 1960s. This means the government was able to generate revenues from domestic procurement policy, which was compulsory at that time. During the 1970s, the procurement prices usually exceeded the average fixed consumer price.

The international wheat price used in the analysis is the reported value of a unit of wheat corrected for handling costs and for the overvaluation of the Egyptian pound (£E), an overvaluation that fluctuated considerably during the period of observation. The black market rate is used as an approximation of the prevailing shadow exchange rate throughout this analysis.[1] For the calculation of producer losses and consumer gains, the international wheat price adjusted as described should reflect the marginal import price. Egypt receives significant amounts of food aid and concessional imports. In 1980 they accounted for about 30 percent of all wheat imported. It should be noted, however, that the marginal import price, which matters in assessing the opportunity costs of wheat products in Egypt, would be affected by food aid donations only if all commercial wheat exporters to Egypt were also food aid donors, providing aid through a tight relation to commercial sales. This is hardly the case, although sometimes a systematic relation between aid and trade seems to prevail for selected trading partners of Egypt.

The following results were obtained from the market analysis. In 1980, wheat producers had an income loss of £E 134 million, which equals 26 percent of the budgeted food subsidies for wheat. Income lost by rice producers because of rice price policy was about £E 260 million in 1980. Subtracting the social loss in production and the small amount of rice export taxes in that year and adding the government outlays for the direct rice subsidy, one arrives at the actual subsidy to rice consumers, calculated

1. £E 1 was U.S. $1.43 at the official exchange rate but U.S. $1.22 at the black market rate in 1980 (Scobie, 1983).

at the opportunity costs to the economy. This invisible producer-to-consumer rice subsidy corresponds to 20 percent of the official (explicit) budget subsidy for all food commodities.

The subsidy to the maize market is established by the government's import and distribution scheme for using maize for feeding purposes. It amounted to £E 94 million in 1980/81. Other than the implicit consumer subsidy for maize, this explicit subsidy is an income transfer to livestock producers. Its net effect on sector income depends on the effect of both this additional maize supply and meat price policy on meat production.

How cereal market policy affects agriculture becomes clearer when wheat, rice, and maize are aggregated. Excluding the exceptional years of the world food crisis (1973–75), the trend of real income losses of cereal producers has declined significantly since 1965. Cereal production was taxed much less during the second half of the 1970s than in the 1960s. The income loss per ton of cereals in 1975 prices dropped from an average of £E 56 during 1965–69 to £E 30 during 1977–80 (von Braun and de Haen, 1983). In other words, taxation of cereal production was reduced, while explicit food subsidies were increasing dramatically. The parallel development of subsidies and taxation of production, which was so striking during the first half of the 1970s, was not the result of a stable causal relation between the two. The taxation of cereal production declined in the late 1970s mainly because both rice procurement prices and maize prices increased. Wheat price policy did not have much effect on aggregate cereal prices. Despite the decreased burden on cereal production, implicit income transfers from producers were still £E 422 million in 1980, which corresponds to about 75 percent of the explicit cereal subsidy budget in that year. Rice alone accounted for about 54 percent of that.

Food Subsidies and the Overall Burden on Agriculture

Consumers received growing support through depressed cereal prices and subsidized distribution in the late 1970s, after several years of reduced transfers following the international food price crisis (see table 12.1). In 1980, 78 percent of all consumer gains on cereal markets came from wheat, 21 percent from rice, and 1 percent from maize.

Egypt's livestock density is one of the highest in the world. Its animal production sector is closely linked to all cropping activities, because cattle and buffalo are used as draft animals and because fodder production and fodder by-products of major crops are important. Because almost no rangeland is available in the country, the opportunity cost of fodder is determined by the prices of all other crops. Since the mid-1970s, domestic meat prices have exceeded international prices, which indicates that meat production is protected. The same is true for milk production.

TABLE 12.1 Income transfers from food subsidies and distorted prices in farm households, Egypt

Subsidy	Farm Sizes			
	Landless Farm Labor	0-1 Feddan	1-5 Feddan	More Than 5 Feddan
Gains and losses in production and input use (£E per capita per year)				
Cereals and pulses		−1.4	−9.4	−30.9
Meat and milk	0.8	6.8	17.3	15.6
Cotton and cane		−6.0	−29.7	−95.9
Inputs (subsidies)	1.6	6.7	12.9	30.6
Total	2.4	6.1	−8.9	−80.6
Gains and losses in consumption (£E per capita per year)				
Rations and cooperative sales	6.1	7.5	6.9	6.1
Bread and government flour	13.4	13.7	8.7	7.5
Cereals from open market	12.7	11.8	10.8	7.7
Other from open market	−8.1	−9.1	−8.4	−13.9
Total	24.1	23.9	18.0	7.4
Total expenditure	189.9	238.7	274.5	388.4
Net gains or losses	26.5	30.0	9.1	−73.2
Percent of total expenditure	14.0	12.6	3.3	−18.8

SOURCE: Data from the household survey made by the International Food Policy Research Institute and the Institute of National Planning, Cairo, 1981/82.

NOTE: Farm households are classified by the main occupation of the head of household. One feddan = 0.42 hectare.

Because meat is consumed mainly by the high-income population, the price policy has important implications for equity as well. In other words, meat and milk protection transfers income from the urban to the farm sector (chapter 11). Taxation of most other farm products does the opposite. Farmers' gains from protectionist prices increased remarkably during the 1970s. This partially compensated for the producers' losses on the other commodity markets.

Price distortions affect not only the distribution of income between producers and consumers but income transfers between crop and livestock production sectors as well. Insofar as feed prices are distorted, they will change the competitiveness of livestock production with crop production.

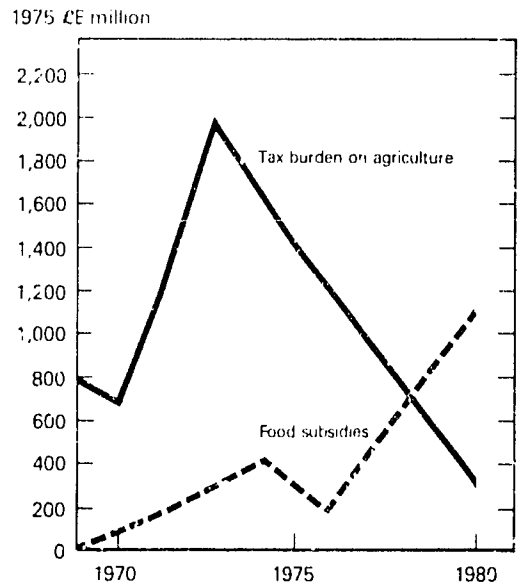
Direct and indirect feed subsidies, with protectionism on the output side of animal production, give a different picture of the aggregate taxation of agriculture than if only major field crops are taken into account. The following aggregation of all losses and gains of the farm sector due to price distortions further highlights this fact. This aggregate burden on agriculture, expressed in 1975 prices, fluctuated between £E 500 million and £E 1 billion between 1965 and 1972. After an extraordinary peak in 1973–

75, it dropped to about £E 350 million per year in 1976. In other words, agriculture was implicitly taxed much less in the second half of the 1970s than before (see figure 12.2). The total burden was reduced mostly by lowering the burden on cereals and cotton and increasing protection of animal products. It was mainly the development of livestock protection after 1974 that changed the relation between agriculture and the rest of the economy.

As the time series of the implicit producer to consumer transfers for the major food commodity markets show, explicit food subsidies evolved out of a system of implicit consumer subsidies largely financed by agriculture. The skyrocketing food subsidy budget for the system after 1973 is astonishing only if the agricultural policy and related implicit subsidies of earlier years are ignored. High population growth, high income growth, and weak performance of agricultural production suddenly induced a rapid decrease in self-sufficiency. How did agricultural policy react to this change?

A regression model was used to assess more comprehensively the role of each of the contributors to the total burden. The model evaluates the hypothetical effects on the agricultural burden of the three major policy objectives: to isolate domestic prices from international price fluctuations,

FIGURE 12.2 Development of food subsidies and the tax burden on Egyptian agriculture, 1970–1980



SOURCES: Von Braun and de Haen, 1983; Alderman, von Braun, and Sakr, 1982

to generate public revenues, and to reduce explicit food subsidies (von Braun and de Haen, 1983).

The results show that factors representing the domestic price stabilization objective and the availability of government revenues dominate changes in the burden on agriculture. The rising food subsidy bill either had no effect on the burden on agriculture or it tended to reduce it. The estimation results also reveal how important increased fiscal revenues from other sources, such as oil and the Suez Canal, were in the rapid decrease of the tax burden on agriculture.

The results do not indicate that agricultural policy is being dramatically revised as part of an economic strategy that emphasizes agriculture more and industry less, but they show a general shift in this direction. Government's behavior in the past indicates, however, that if revenues get tight agricultural policy may be redirected to increase the burden on agriculture in order to save fiscal resources but maintain the price level of major food items distributed through public sector channels.

Food Subsidies and Farmers: Income Effects and Farm Household Responses

The sectoral perspective followed so far has allowed assessment of agricultural policymaking in the environment of a dominating food subsidy system. In general, food producers are losing because of the policy, while consumers gain, although for some markets like meat and milk the picture is actually reversed. How this policy affects farm households, which are both producers and consumers, deserves further analysis. The farm population participates heavily in the subsidy scheme as consumers, and the production pattern of implicitly taxed or protected products is far from being uniform among Egyptian farms. The specific loss and gain patterns of farm households determine the income distribution effects of the price policy within agriculture. They are assessed below.

Farm Income Effects

A comparative static approach was applied to broadly quantify product-specific income effects of distorted prices on a household basis (Alderman and von Braun, 1984). Survey data collected specifically for this purpose were used for the analysis. The patterns of losses and gains and the size of the net loss or gain were determined by the level and structure of price distortions, the farm production structure, input intensity and productivity, and resource endowments. Production structures and input intensity are again heavily determined by input and output price ratios and levels, including prices of inputs such as labor. Abundant family labor at low opportunity costs on small farms usually leads to higher production

intensity there. This may, all things being equal, result in higher yields, and production may be directed toward more labor-intensive activities, such as the livestock sector.

These determinants actually establish a distinct gain-loss pattern in the farm sector, as small farms are relatively more concentrated in the labor-intensive (protected) livestock sector, whereas bigger farms actually lose disproportionately from higher shares of implicitly taxed crops in their production programs. Table 12.1 shows these patterns for three farm-size groups. It should be mentioned that not all of the allocation differences between farm-size groups are a consequence of the actual incentive structure but may be partly the result of government-enforced area allotments (such as those for cotton, sugar, and rice).

Small farmers (less than one feddan, or 0.42 hectare) are net gainers from the distorted price structure on the production side, which adds to their gains (income transfers) from food subsidies on the consumption side. For this group, losses on cereals, sugarcane, and cotton are overcompensated for by the gains from animal production and input subsidies (mainly feed). Although medium-sized farms (one to five feddan) are net losers on the production side, these losses are less than their gains on the consumption side, leaving the group a net gainer. This is not the case with larger farms of more than five feddan. In this group, net losses on the income-generating production side greatly exceed income transfers on the consumption side.[2] For income distribution of the agricultural population as a whole, the combined effect of food subsidies and distorted agricultural prices is even more progressive than the income transfer effects on the consumption side alone.

Many rural people derive income from part-time agricultural production activities, even landless farm workers. In a classification into ten groups by employment, landless farm workers is the poorest, with a mean per capita income 32 percent below the rural average and 62 percent below the urban average. For these workers, subsidies and price distortions result in a net gain of 14 percent of their current nominal expenditure, while the larger farmers have a net loss of 18.8 percent relative to their total expenditure. This reflects the fact that the food basket purchased by the landless has a high proportion of subsidized commodities, hence this group has a high *relative* subsidy. The extent to which landless farm workers benefit both from wheat flour and bread directly subsidized by the government and from low open-market prices of cereals is particularly striking (table 12.1). The sum of these explicit and implicit subsidies on cereals represents 13.7 percent of their total expenditures. Given the high budget

2. On-farm consumption is excluded from the gain-loss balancing on the production and consumption sides, as it does not affect net income transfers.

share of basic food expenditure by rural wage laborers, any reduction in subsidized food supplies to rural households, possibly combined with a policy of higher cereal prices on the open markets, would have negative effects on this group's food situation. Unlike farm households with actual or potential cereal production, landless laborers would not immediately benefit from compensatory measures focusing on output pricing if such instruments were applied parallel to a reduction of food subsidies.

Cereals are the dominant source of calories in Egyptian farm households, and acquisition of subsidized cereals plays an important role for the levels and composition of cereals consumption. Therefore, analyses of the effects of the availability of subsidized cereals on grain production, on the marketing of farmers' own grain produce and on cereals consumption are of particular interest. The overview for the aggregate supply and disappearance balance of all cereals by farm households in table 12.2 reveals that

1. Cereal consumption per capita hardly increases by farm size. Overall, it is at a fairly high level in per capita terms.[3] The composition of this consumption, however, does vary by farm size.
2. Subsidized cereals from direct government distribution make up one-third of cereals consumption in rural households.
3. Rural households in Upper Egypt receive about twice as much subsidized cereal from the government as those in Lower Egypt.
4. Landless households acquire about the same amount as small farm households (less than one feddan), but with increasing farm size, households make less use of subsidized cereals.
5. Even medium and big farms purchase considerable amounts of cereals. At the same time, they sell their own produce. Market integration of farm households is generally fairly high in Egypt.

Farm Household Responses

The availability of subsidized cereals in farm households decreases grain production, but farm households with higher grain production make less use of subsidized cereals. A bakery in the village, other things being equal, induces a reduction of grain production in that area by 13 percent, and if subsidized cereals acquired by the household are increased by 10 percent, grain production drops by 0.5 percent. These production effects of subsidized cereals distribution turn out to be significant after farm size differences and government acreage allotment for cash crops (cotton and sugarcane) are accounted for in an analysis based on farm household data (Alderman and von Braun, 1984).

3. These quantities are not intakes, as intrahousehold losses are not accounted for.

TABLE 12.2 Aggregate cereal balances for rural households, Egypt, 1981/82 (kilograms per capita per year)

	Cereal Supply[a]			Cereal Disappearance[a]		
		Purchased				
Rural Households	Production	Open Market	Subsidized[b]	Sales and Seed	Human Consumption	Animal Feed
Upper Egypt	137	143	147	53	326	49
Lower Egypt	191	166	79	96	314	27
Landless	0	197	129	0	304	23
0-1 feddan	98	160	131	22	329	38
1-3 feddan	268	141	78	112	328	49
3-5 feddan	361	108	59	186	314	30
>5 feddan	607	95	55	378	332	43
Total	171	158	104	80	319	35

SOURCE: Data from the household survey made by the International Food Policy Research Institute and the Institute of National Planning, Cairo, 1981/82.

[a]From direct government distribution.

[b]Cereals and cereals products are expressed in wheat grain equivalents of kilograms per capita per year (wheat flour, bread, maize, rice, sorghum, and barley are included).

Responsiveness to price differentials between food grains (rice) and grains used as feed (wheat and maize) and the strong response of grain production to input prices for livestock production (straw) emphasize the effect of livestock protection on grain production. Feed demand for livestock and its price effects on cereal by-products has a different effect on the various crops: maize production goes up while overall grain production is reduced when there is more livestock on the farm. In addition, wheat production is affected in a particular way due to the importance of wheat straw for fodder. An increased straw price significantly increases the incentive to grow wheat. This increases total grain output as well.

Availability of subsidized cereals turns out not to significantly affect grain sales of farm households but does increase total per capita consumption. Contrary to expectations, increased consumption of subsidized cereals does not significantly increase the marketed surplus of grain produced on farms. One might expect that households make use of subsidized cereals in substitution for consumption of their own produce and thus implicitly resell subsidized bread, flour, or maize because sales of grain would be higher. But this is not suggested by empirical analysis. The main adjustment to the availability of subsidized cereals occurs in consumption, not in production and sales by farm households. An additional kilogram of subsidized cereals per capita raises consumption by 763 grams per capita.

Conclusions and Policy Implications

Egypt's current food subsidy system did not spring from one decision made in the early 1970s, even though it was then that the huge fiscal outlays that characterize it began. It evolved from agricultural and consumer price policies implemented a long time before. These policies included export taxes to finance an industrial growth strategy and implicit transfers of income from producers to consumers—implicit food subsidies to finance cheap food prices. Given this background, it is not surprising that Egypt moved to an explicit food subsidy scheme as the self-sufficiency of major commodities that were implicitly subsidized (such as wheat) decreased rapidly.

The course that Egypt's food policies have taken provides an important lesson for countries keeping producer prices low to support consumers. Supply and demand projections show that many of these countries are going to become net importers of food in the years ahead. If they have rather plentiful nonagricultural resources—as Egypt had, mainly because of its rapidly developed oil reserves, the Suez Canal, and foreign assistance—it seems fair to predict that many of these countries are going to drift from implicit to explicit food subsidy schemes, as Egypt did. But when this happens, tight budgets will make severe internal distribution conflicts unavoidable. These countries will have to know more about how to revise their food pricing systems and still ensure nutritional well-being.

Another issue is raised by the conclusion that, in spite of rising budget outlays for food subsidies, the income burden on farm production has been steadily reduced. This reduction was the result of several factors, including changes in procurement policies, adjustments of price levels and price ratios, and variations in interventions in agricultural trade. It was particularly a result of rising prices in domestic open food markets. During the course of the 1970s, agriculture financed low consumer prices less and the general taxpayer financed them more. Agriculture's contribution to the system decreased in absolute terms. This means that consumer subsidies are not always a burden to agricultural production. In Egypt, the system's expansion by and large has not been a burden for the agricultural sector. However, it was possible to shift from implicit to explicit subsidies only because government revenues increased. Foreign assistance played its part in that.

The implicit tax burden on agriculture is not equally distributed within the sector. The net effects of gains and losses on the production side from taxation of some crops, such as cotton and cereals, and protection of others, such as milk and meat, favor the small farmers. Combined with income transfers on the consumption side from food subsidies accrued, small farming households clearly are net gainers from the price and sub-

sidy policy, whereas big farming households are net losers. The distortions of agricultural output and input prices make the food subsidy system even more progressive for income distribution within the farm population. Farm-level analyses reveal that provision of subsidized cereals to farm households induces somewhat reduced grain production but mainly adds to consumption.

13 Food Subsidies in Egypt: Macroeconomic and Trade Implications

GRANT M. SCOBIE

The principal theme of this chapter is the implications of the Egyptian food subsidies for such macroeconomic measures as nonfarm output, the government's budget, inflation, the exchange rate, and the balance of payments. There is, however, an important secondary theme—namely, the extent to which the policies in the food sector are themselves molded by the macroeconomic setting. For example, it is hard to imagine that the level of Egypt's food subsidies is unrelated to the country's capacity to import. So while exploring the implications of the food subsidy scheme, these reverse linkages will also be examined.

A complete analysis of the macroeconomic consequences of food subsidies would demand a general equilibrium framework. Although small, computationally manageable general equilibrium models are emerging, they still require significant abstraction. The benefits from a partial approach to testing some specific hypotheses about the effect of food subsidies at least partly outweigh the costs of forgoing "completeness," because fewer strong and sometimes questionable assumptions have to be made to substitute for data needed but not available. Perhaps the insights gained from these partial efforts will form building blocks for subsequent and more complete syntheses.

The approach in the studies summarized here has been to draw on standard economic models, to apply them in a positive manner to testing hypotheses, but to enrich their structures with key elements of the policy environment, as distinct from the political environment. However, the evolution of food policies and their macroeconomic effects should not be considered in isolation from the historical setting and the political environment. For this reason, a brief glimpse of the Egyptian background is provided. After setting out the general analytical framework, the budgetary consequences are reviewed and the consequences for the foreign sector, both real and monetary, are presented. Finally, conclusions are drawn and implications for policy formulation are noted.

Historical Perspective

With the possible exception of military endeavors, food policy has been the single most dominant theme of state involvement in Egyptian society for all of recorded history. To simply lump Egypt's current food subsidies into the general category of basic needs strategies would be to completely overlook their deep and important historical roots. Policies influencing the production, consumption, and external trade in wheat are tightly interwoven into the country's entire historical fabric.

State granaries have existed in Egypt since Pharaonic times. Foreign trade controls; retail price fixing; subsidized sales from state granaries; state *muhtasibs* (market inspectors—in effect a wheat police); heavy taxes (often in the form of compulsory deliveries) on merchants and brokers; controls on milling rates, the weight of the loaf, and the extent of substitute grains; public distribution to the indigent—all these are the hallmarks of Egyptian food policy in Pharaonic times, through eras of the Fatimids and the Mamluk sultans and emirs, and moderating only perhaps in the middle of the last century with the demise of the archetype interventionist, Mohamed Ali.

Food subsidies have been pursued in various forms for at least ten centuries. Fatimid caliphs sold wheat below ruling market prices in times of shortage and ordered the baking of bread and its distribution to Cairo's poor. The public distribution of grain at subsidized prices was seen as part of the moral responsibility of the rulers and was an important element in the preservation of social stability (Scobie, 1981). Food riots were as real in the fourteenth and fifteenth centuries as they were in 1975, with the Helwan steelworkers' strike, and in January 1977.

Historically, crises arose from shortfalls in domestic production, rises in external prices, the need to finance military endeavors, and disruptions to foreign trade. It is significant that the same sources of instability characterize modern Egyptian wheat policy (although the uncertainty of foreign aid would have to be added to today's list). Even more striking is that the instruments of policy are the same today as they have been for centuries. The forces that mold and constrain those policies are essentially independent of the political structure of the moment. Whether the rule is unified Pharaonic, dispersed caliphate, despotic invader, or socialist military, the overriding lesson of history is that the sources of instability and the policy responses to them are amazingly consistent. This predictability lessens if not obviates the need to reflect structural changes in the political environment in models of food policy. Furthermore, it reinforces the contention that a common set of economic tools can be used to gain insights into policy action and reactions in diverse institutional settings.

Political Setting

Since 1973 Egypt has undergone a series of important economic and political changes. At that time, the economy had been sustaining a major military effort for eight years. Real personal incomes had been static or declining. Per capita consumption of wheat, the major staple, had fallen. Since the Suez War of 1956, the economic and political orientation of Egypt had been increasingly dominated by its relation with the Eastern bloc countries. Emphasis had been given to the material planning approach and the use of centralized controls. There were severe restrictions on foreign exchange, and the import of investment goods had been neglected in order to acquire war materials. As a consequence, the immediate postwar outlook was bleak—a large and inefficient bureaucracy, a depleted capital stock, shortages of parts and raw materials, and foreign debt repayments beyond the capacity of the country to generate foreign exchange. Anwar Sadat reported that the country had reached the "zero stage" economically in 1973 and could not have met debt repayments or purchased foreign wheat in 1974 unless changes were made.

The economic policy that evolved after 1973 placed new reliance on restoring trade and investment with Western countries and with encouraging private economic activity. These strategies were formally cast in Law 43 of 1974, and have become known as *al-infitah*, or the opening.

At first glance, there is an irony in the fact that the new economic order with its greater reliance on market signals and private economic activity has been accompanied by burgeoning public sector expenditures, especially for subsidies. Some have attributed this increase to the rise in commodity prices in 1973–74. Certainly subsidy expenditures rose in these years; but importantly, they did not decline subsequently. The development since 1973 fails to support the hypothesis that the large rise in subsidy expenditures was simply a transitory phenomenon associated with a temporary rise in world-market prices.

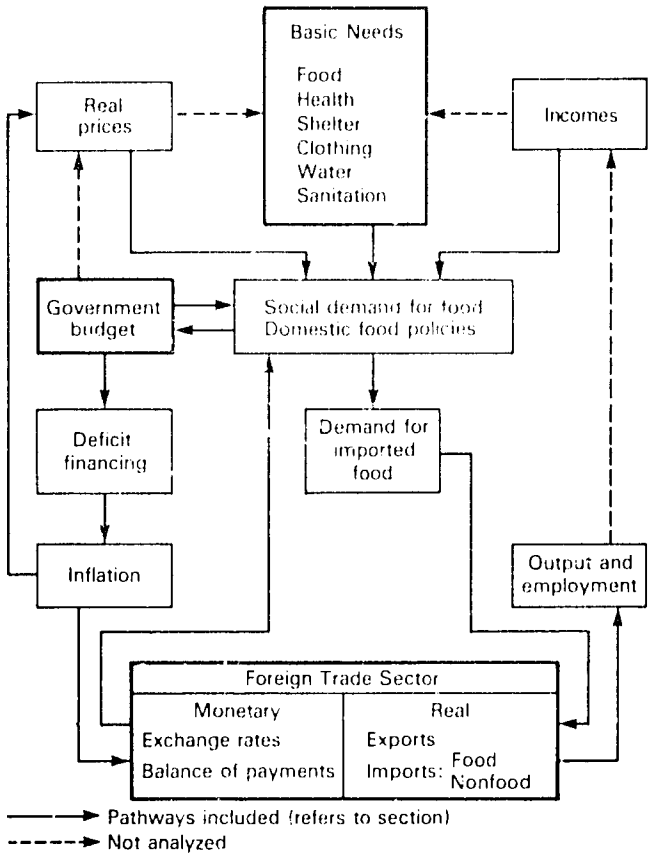
An alternative view is suggested by the model of government expenditures developed by Peltzman (1980). The economic changes both engendered and were accompanied by changes in the nature of the country's politics. Access to new economic resources led to intense debate about their allocation (Choueri and Eckaus, 1979). The economic opening has been coupled with a political opening, in which an increasingly powerful vox populi has strengthened the government's commitments to social policies whose origins lay in the 1952 revolution. Their expression had been quelled by long periods of hardships imposed by military endeavors. The strength of those forces has been demonstrated in the reaction to attempts to limit their access to economic and political power; for instance, in the food riots of January 1977.

Since 1973 the country's ability to give concrete expression to its stated policies has improved dramatically. This shows up vividly in food imports. Imports of staples were about 50 kilograms per capita in the 1960s. By 1970, these had fallen to 20 kilograms per capita, while by 1980 they had risen to 150 kilograms. Imports represented a significant change in per capita disappearance, with an associated rise in expenditures for subsidies that has had widespread ramifications, both real and monetary.

Analytical Scheme

The framework for the research reported here is sketched in figure 13.1 (Scobie, 1983, 1984). It should not be interpreted as a flow chart with causality implied between the elements. Rather it highlights the key issues

FIGURE 13.1 The analytical scheme



and variables, indicates the linkages between them, and provides a reader's guide.

The starting point is the question of basic needs. For whatever reason, the Egyptian government attempts to augment the consumption of some key goods and services beyond the level that would occur in the absence of interventions. This can be captured by a social welfare function and the corrresponding social demand curves (Scandizzo and Knudsen, 1980; Harberger, 1978). At any given price of food, the social quantity will exceed the private quantity demanded. A principal device to raise consumption to the socially desirable level has been the sale of subsidized foods (Alderman, von Braun, and Sakr, 1982). These have involved various attempts at targeting and rationing (see chapter 12), the notable exception being wheat and flour, which, while neither targeted nor rationed, account for half the total subsidies. The wheat price to consumers has been held down to between 20 and 30 percent of the cost, insurance, freight (c.i.f.) border price. Furthermore, the real price of wheat to consumers has varied substantially. Between the revolution in 1952 and the buildup to the 1967 war, the real price doubled. It remained relatively high until 1973. By 1980 it had fallen to less than half the real price in 1973.

Naturally, this has led to a marked rise in imports and, more particularly, in food's share of total imports. This share rose from about 10 percent in 1971 to almost 40 percent by 1981. As discussed later, this development was of great importance for the growth and stability of nonfood imports and, therefore, for output and employment. Clearly, changes in output and employment are closely linked with changes in real income. The models presented in this chapter do not incorporate the formal linkage, however, and conceivably it is here that the contribution of a more general equilibrium approach would lie.

On the monetary side of the economy, the analysis has traced the implications of the government budget and its deficit financing for inflation, exchange rates, and the balance of payments. These elements also condition the setting of domestic food policies.

Budgetary Consequences

Total resources available to the economy have grown, albeit erratically, since 1950. With increased military expenditures and changing foreign and economic policies, there was virtually no change in private real consumption for a decade, from 1965 to 1975.

Since the mid-1970s a marked recovery has occurred. A more open economy, greater investment, resumed flows of aid, and substantial foreign exchange earnings (from petroleum, the Suez Canal, tourism, and remittances) have all contributed to doubling the real per capita command

over resources. Real investment and private consumption have risen more rapidly than public consumption. In real per capita terms, the expenditures on subsidies have also risen substantially although less than private consumption. Thus subsidies were 19 percent of private consumption in 1975 but fell to about 10 percent in the early 1980s.

Between 1970 and 1981 subsidy expenditures rose rapidly in nominal terms. However, real available resources grew by 140 Egyptian pounds (£E) per capita in this period; the real increase in subsidies was about £E 20 per capita. From 1975 to 1981, growth in resources was about £E 120 per capita, while real subsidies grew by £E 7 per capita. Thus during the period of rapidly expanding subsidy expenditures, only 6 percent of the increase in total available resources was dedicated to increased subsidies.

On the other hand, it is true that subsidies have increased their share of government expenditures. Total government expenditures rose as a proportion of gross national product from 30 percent in 1970 to 45 percent in 1980. However, the even more rapid rise in subsidy expenditures has meant that the structure of government spending has had to change, with less emphasis placed on defense. In contrast, investment and subsidies account for nearly 80 percent of the budget now, compared with about 30 percent in 1970.

It does not appear that greater subsidies have come at the expense of investment (von Braun and de Haen, 1983). If public investment is taken to include expenditures on health and education (investment in human capital), then the recent trends toward higher subsidies have not outstripped investment. Of course, if all the increase in subsidy expenditures had been invested, then future growth and incomes might possibly be higher. But the same argument would apply to any other element of government expenditure (Scobie and Valdés, 1982).

The proportion of total resource use in the public domain rose from less than 20 percent in the 1950s to 35 percent at the end of the 1970s. The public sector now controls a greater proportion of total resources than at the time of the revolution. As the relative political strength of claimant groups has varied over the last decade, so has both the mix of public activity and the ratio of public to private activity. The state has become more concerned with transfers and less with production and investment relative to the private sector.

Foreign loans and grants, together with a significant rise in net factor income (largely remittances), export receipts from the Suez Canal, petroleum, and tourism, have made this change of emphasis possible. Even if all the subsidy expenditures had been financed from foreign grants and borrowing and from net factor income from abroad, they would have required less than half the increase in the last decade. These resources have naturally given the government greater freedom to respond to the political pres-

sures for claims on resources; but it would be a gross overstatement to claim that Egypt has simply consumed the additional resources. Substantial rises in investment have occurred simultaneously. In fact, the rise in expenditures on subsidies, though dramatic, has not been out of keeping with the growth of investment and consumption expenditures.

Real Consequences

The decline in the real price of wheat has been a major feature of Egypt's food subsidies. In order to hold down the price without creating excess demand, imports have expanded from about 2 million to 7 million tons in the last decade.

There are a number of important characteristics of this import demand. First, it has been a large and growing share of total imports and results in the need to consider the total allocation of import expenditures. Second, import demand is clearly a reflection of domestic policies for production and consumption. Third, all foreign trade in wheat is undertaken by a state agency, so that government policies impinge directly on the amount of imports. Fourth, a large part of the imports are concessional, and it is important to recognize this explicitly. Finally, the substitution effects in both production and consumption are important, and will enter the decision about internal pricing.

These characteristics formed the basis for the development of a wheat import demand model. The economy was seen to face a foreign exchange constraint as the result of driving wedges between domestic and world prices. This created an excess demand for foreign currency, the repercussions of which were reflected in the allocation of import expenditures, the size of the price wedges themselves, and the policy toward the cotton sector. The latter is important because it supplies foreign exchange and competes with wheat for resources.

As a consequence of the very low price paid by consumers for wheat, the domestic demand is highly inelastic, with an elasticity of probably less than −0.1. Similarly, the import demand is relatively inelastic with respect to the world price (elasticity about −0.2). Although some of the changes in the world price are transmitted to domestic prices, the effect on domestic consumption is minimal; as a consequence, international price changes are reflected more in import expenditures on wheat than in quantity of wheat imported. With no direct market mechanism to ration scarce foreign exchange through a higher price, the Economic Committee on the cabinet must make decisions about the allocation of a given quantity of foreign exchange to imports and reserve holdings. While changes in net foreign assets are one mechanism for cushioning the adjustment, a major

part of exogenous shocks in world food markets is transmitted to the import of nonfood items.

Similarly, changes in the supply of foreign exchange have relatively little effect on wheat imports. A fall of one dollar in the supply of foreign exchange results in a cut in wheat expenditures of five cents; over 90 percent of the reduction falls on the imports of nonfood items. In the long run, for a given growth in the supply of foreign exchange, a policy of expanding food imports means a lower share for other classes of goods, resulting in a slower growth of the capital stock. The short-run effect will be the destabilization of imports of raw materials and capital goods. If raw material imports decline, then the rate of capacity utilization of the existing capital stock will fall.[1]

A complete system of import demand equations was used to estimate the direct and cross-price elasticities for seven categories of imports, in addition to the marginal budget shares (El Elarab, 1982). The marginal budget shares were estimated to be about 5 percent for food, 15 percent for raw materials, and 30 percent for imported machinery. These findings are consistent with the hypothesis that priority is given to food in the allocation of foreign exchange. The provision of raw materials to maintain current output is then accorded priority over the import of capital goods, which are presumably viewed as postponable. Both industrial output and gross fixed investment in industry and manufacturing were found to be sensitive to the imports of raw materials and capital goods.

Monetary Consequences

This section briefly reviews the implications of a rapid rise in government expenditure. A monetary approach to the balance of payments is used to develop an econometric model with four endogenous variables: the black market exchange rate, the inflation rate, the balance of payments, and the demand for real money balances.

Clearly, the cost of the subsidy schemes has been substantial. In 1981, budgeted subsidy expenditures were equal to about two-thirds of the deficit of the central government. These costs have been met by tax revenues, foreign aid and concessional loans, and external borrowing. However, a significant part of the government deficit has been met by the creation of liabilities held as assets of the central bank. This expansion in the net domestic credit component of the monetary base has been especially marked

1. Bhagwati (1978) notes that there is a tendency for chronic overcapacity under foreign exchange allocation schemes. This arises partly because the issue of import licenses is related to installed capacity and partly because excess capacity is an insurance against delays in getting crucial parts.

since 1973. Such an increase in high-powered money and the concomitant rise in the money supply have had far-reaching effects.

The role of these monetary variables in the determination of exchange rates and the balance of payments has received increased attention, both theoretical (Fraenkel and Johnson, 1978) and empirical (Blejer, 1979; Putnam and Wilford, 1979). The fundamental proposition is that the process of adjustment involves disequilibria in the stocks of assets rather than in the flows of commodities.[2] Although a majority of the existing studies have been based on a single exchange rate, the long history of rather complex intervention in the Egyptian foreign currency market makes it imperative to include both official rates (for food and nonfood) and the black market rate. The excess demand at the persistently overvalued official rates has been transmitted to a well-organized (and intermittently sanctioned) black market.

The results of this model were used to estimate the effect of a 10 percent rise in food subsidies, with other government expenditures held constant. This would result in an increase of 5 percent in the inflation rate; a decline of 2 percent in the balance of payments (the stock of net foreign assets); and a devaluation of 3 percent in the black market exchange rate. The pressure generated in the foreign exchange market by the deficit financing of food subsidies can be relieved in two ways. The stock of net foreign assets can decline or the Egyptian pound can be devalued. A simplified form of the model used here is equivalent to an exchange market pressure model, which expresses the sum of the changes in the exchange rate and net foreign assets as a function of the foreign price, the rate of domestic credit expansion, and the demand for real balances (Girton and Roper, 1977; Connally and da Silveira, 1979). It explained 62 percent of the variation in the exchange market pressure in Egypt.

Summary and Conclusions

Controls and subsidies on food have been part of Egypt's social policy for centuries. The growth in the last decade has reflected a deliberately chosen set of economic and social policies. These have found greater expression in view of a rapid rise in the country's total command over resources.

In relation to this growth in total available resources, the rise in subsidy costs has been more modest than often depicted. Furthermore, they do not appear to have been at the expense of investment. It is not clear that the much discussed trade-off between growth and equity has occurred. Some would undoubtedly conclude that, despite the move to greater eco-

2. Burton (1981) highlights the importance of the Eurodollar market in determining the asset holding of Egypt's remittance earners and the implications for the black market exchange rate.

nomic freedom, the Egyptian economy is still sufficiently shackled that there would be considerable scope for more of both. What is evident is that, in the foreign sector, the food subsidy scheme has had consequences, both real and monetary. This study has made some attempts to identify and quantify those consequences.

The effect of deficit government financing on both the exchange rate and the inflation rate is a significant factor for policymakers to consider in setting subsidies. To the extent that food subsidies induce inflation, they may erode the ability of low-income groups to acquire a basic bundle of goods and services—that is, bread may become cheaper but housing more expensive. Food subsidies are only one instrument in meeting the basic needs of the poorest; furthermore, it is their net contribution that must be the focus of attention.

The highly inelastic demand for food engendered by the subsidy scheme means that any instability in world prices or in the supply of foreign exchange is transmitted to other parts of the economy. Instability is never costless and cannot be willed way. But to the extent that fluctuations in output and investment affect incomes and the growth of employment among poorer groups, then a legitimate question arises about the incidence of those costs. Is maintaining food consumption at the expense of destabilizing employment an appropriate strategy? Would the holding of greater foreign exchange reserves, for example, be a more or less costly strategy? And what would be the incidence of costs under such a scheme? These questions must surely appear on the research agenda of analysts interested in the broad ramifications of food policies.

Clearly, compensatory finance schemes have an important role in this context. With a low marginal propensity to import food, however, access to a special fund such as the International Monetary Fund's Food Facility would lead to few additional food imports in a country such as Egypt. Rather, it would contribute more to stabilizing nonfood import expenditures. It is not clear, however, that the optimal strategy is to provide full compensation for deviations in the food import bill if a parallel scheme is operating for export earnings (Green, 1983). The level of compensation to minimize the variance of food consumption will vary with the extent to which shortfalls in domestic production are compensated for by imports and with the marginal propensity to import.

Furthermore, it is possible that nonfood consumption could actually be destabilized further in the presence of a food facility. The problem here is that two targets, minimizing the variance of food and nonfood consumption, will generally require two instruments. It is clear that the transmission of instability is an important issue arising from the implementation of large-scale food subsidy schemes. Policies, both national and international, for minimizing the costs of instability and their incidence are still evolving and urgently needed.

14 Food Subsidies in the Philippines: Preliminary Results

MARITO GARCIA

Evidence from countries like Sri Lanka and Egypt has shown that the fiscal costs of food price subsidy programs may be high, and once introduced, their termination may be politically difficult (Gavan and Sri Chandrasekera, 1979; Alderman, von Braun, and Sakr, 1982). On the other hand, if they are carefully designed and properly targeted, their effect on food consumption and nutrition may be significant. Although a food price subsidy scheme may sometimes present the most cost-effective approach to calorie or protein deficiencies, the introduction of such a program should be based on solid evidence regarding its cost effectiveness both in absolute terms and relative to alternative programs.

The results from analyses of similar programs elsewhere, such as Sri Lanka, Egypt, Pakistan, Bangladesh, and Kerala, India, provide useful guidelines (Rogers, 1978; R. Ahmed, 1979; and Kumar, 1979). But a more solid information base can be obtained if these results are supplemented by a pilot study of the proposed program design in the particular administrative, socioeconomic, and cultural environment for which the program is intended. This chapter presents some preliminary results from an experiment on consumer food price discounts testing the program's technical and administrative feasibility in the context of the Philippine environment. Three provinces, representing three prevalent ecological settings, were selected for the pilot study, which involved a combined experimental and control population of 15,729. The results presented are focused on the evaluation of the process, particularly the administrative experience. The program's effects on the recipients are presented in Garcia and Pinstrup-Andersen, 1987.

Design and Scope of the Pilot Food Discount Program

Administrative Setting

The proposal for a food price discount scheme targeted to low-income households was developed by the Philippine National Nutrition Council

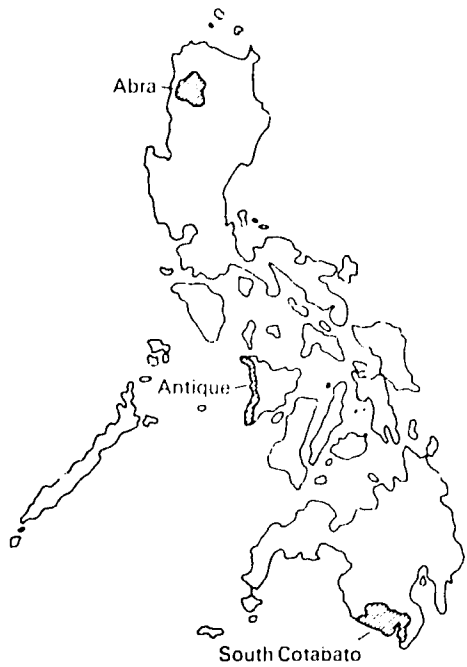
and the Ministry of Agriculture as one of the main thrusts of the Food and Nutrition Plan, which is a strategy for combating hunger and malnutrition in the Philippines in the 1980s. If implemented, the scheme would utilize and build upon the existing human infrastructure of the Philippine Nutrition Program, the Ministry of Agriculture, and other programs at the community level. In order to assess the feasibility of such a scheme, it was decided to first implement a one-year pilot project.

Pilot Areas and Coverage

The pilot villages were selected from three provinces with different socioeconomic and ecological environments. As the map shows (figure 14.1), one group is located in the northern Philippines (Abra), one in the central part (Antique), and the third in the south (South Cotabato). The first group of villages is located in an upland area where tobacco and subsistence corn are the main crops. The second group is situated along the coast, and these villages are dependent on fishing and marginal rice farming for livelihood. The third group is spread over a rich river basin that is planted mainly with corn.

Three pairs of villages in each of the three provinces were selected as samples: one pair for testing the effects of a rice and oil subsidy, one pair

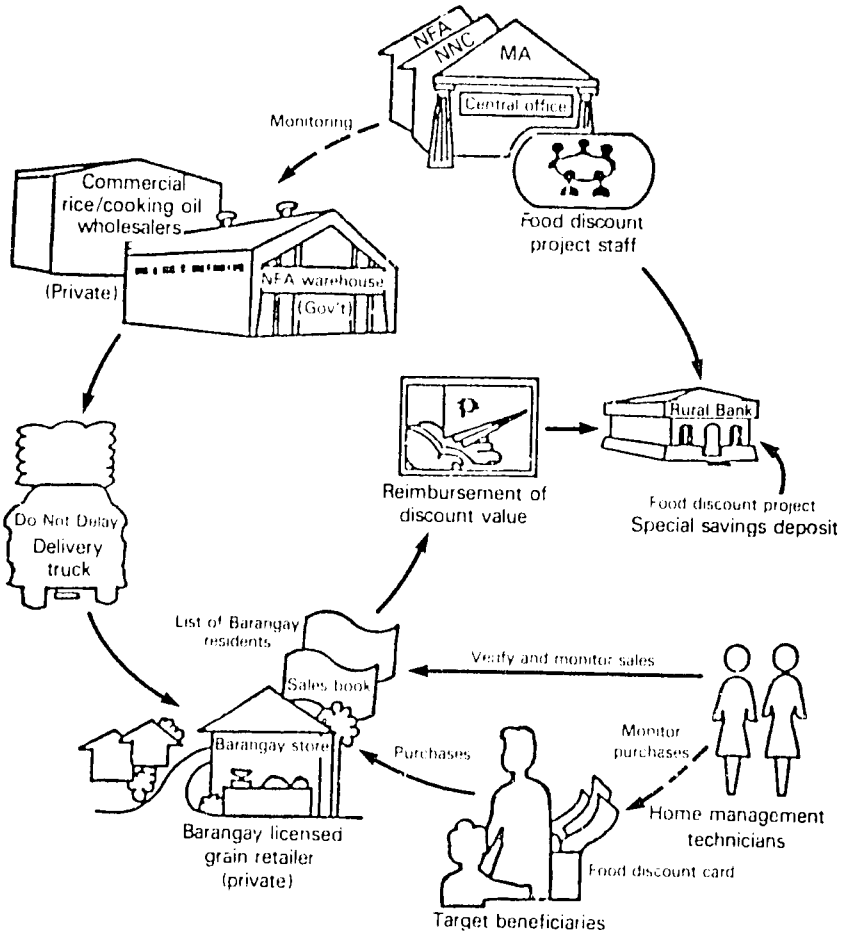
FIGURE 14.1 Map of the Philippines indicating study areas



as control villages, and a third pair to test the effects of subsidizing only cooking oil. In one of each of the pairs of villages, nutrition education was introduced as an additional program to test its effectiveness as a supporting intervention. The total population of the pilot subsidy areas was estimated at 15,729, spread over fourteen villages.

The principal element of the food discount scheme is a reduction in the price of selected food commodities offered for sale in selected areas. A simplified flow chart of the operation of the pilot food discount system is given in figure 14.2. Each household in the project area is issued a ration

FIGURE 14.2 Delivery system for the Philippine pilot food discount project



Note: NFA is the National Food Administration, NNC is the National Nutrition Council, and MA is the Ministry of Agriculture.

(discount) card, which guarantees a monthly quota of rice and cooking oil at a subsidized price. The coded, nontransferable card, which shows the monthly quota of the household based on household size, provides space to record the purchases and signature of the store owner. The local office of the Ministry of Agriculture issues the cards every month through its home management technicians.

Small privately owned village stores are accredited by the project as marketing outlets for the subsidized food. The outlets are typical neighborhood variety stores, usually located at the center of each village. They are family run and normally operate with a small revolving capital. The food distribution mechanism of the program is primarily in the hands of the private sector. This encompasses procurement, transportation, handling, and ultimate distribution. The government's role is to monitor the program and to audit the store accounts to determine the actual amounts of the subsidy.

Retailers are reimbursed for the subsidy only after sales are made. In return, the program provides an incentive to retailers of 3 percent of the gross sales of the subsidized commodities. Subsidy accounting, which is done every week by the extension officer, is based on the discount cards. They are all redeemed every month, along with the retailers' sales books. The program uses local banks to reimburse the participating retailers. A special savings deposit account is opened in each area, which is jointly held by the program and the retailer. An accounting form, called a discount reimbursement voucher, is required for the twice-a-month withdrawal from the bank subsidy account. The use and certification of these vouchers helps to control the accounts.

Method of Targeting

The fourteen sample villages were selected from villages where malnutrition is most prevalent. The National Nutrition Council keeps track of these nutritionally worse-off villages through Operation Timbang, a nationwide annual weighing of preschool children done in the majority of municipalities in the country. All bona fide residents of these targeted villages are automatically eligible for participation in the program; hence no household-level screening is done.

Subsidized Food Commodities

Two energy-rich commodities, rice and vegetable oil, are subsidized in the pilot program. These foods, which contribute nearly two-thirds of the calorie intake of an average Filipino, were selected on the basis of both nutritional and economic considerations.

Rice was selected for the program because it is a universally available food in the Philippines, comprising 56 percent of the calorie consumption

of the average Filipino; it is the main and preferred staple food in the country (Philippines, 1982). In addition, the marketing system for rice in the Philippines is efficient and reaches the most widely dispersed populations. Rice has a high price elasticity of demand among low-income households (Bouis, 1982).

Vegetable oil from coconuts, on the other hand, is nutritionally important because of its caloric density. This is particularly so in the case of infants and small children, whose digestive systems cannot absorb the necessary energy from diets based on a high bulk food such as rice. The present annual consumption of 2.9 kilograms of vegetable oil per capita is considered to be inadequate by the Food and Nutrition Research Institute.

Size of Subsidies

The amount of rice that target households may obtain under the pilot scheme is inframarginal for most households, that is, the subsidized quantity is smaller than the amount previously consumed by the family. Under the program, each household member irrespective of age is entitled to five kilograms of subsidized rice per month. Hence the total household quota depends on household size. Per capita rice consumption of these households before the start of the project was about ten kilograms per month on the average.

In the case of cooking oil, the amount that each household member may obtain at discounted prices is higher than the average consumption prior to implementation of the project: 2.5 cups (160 grams per cup) versus 1.75 cups. The higher discounted volume on vegetable oil is a deliberate effort to promote its use in the diet.

The project design calls for a 32 percent discount on rice and a 50 percent discount on cooking oil, estimated initially on the basis of consumption elasticities for the low-income groups (Philippines, 1978).

Administrative and Operating Experience: The First Six Months

Results from the first six months of the pilot experiment have exposed a number of implementation problems not foreseen in the initial program design. These problems and constraints are discussed relative to their implications for a larger-scale program, so that the eventual design will be sensitive to local realities and needs.

Geographic Targeting

Administrative procedures adopted to screen program participants using the village census of population have proven to be relatively accurate in targeting the intended beneficiaries of the program. During the initial

listing of program participants, several households were observed padding household membership. This seemed to be a logical behavior, because the amount of the subsidized ration is determined by household size. In the majority of the villages, the village head was the final arbiter in cases where there was conflicting information on household membership. It is estimated that 20 percent of all households had conflicting claims of membership.

Although the area-targeting method of screening was relatively easier to administer than other forms of screening, such as income criteria (Sri Lanka and the U.S. food stamp programs) or sex and age criteria (Colombia), some unintended effects were observed in its implementation. A number of households invited relatives from neighboring nontarget villages into the targeted villages to share with them the benefits from the subsidy. As a consequence, a net decline in the food available for each number of these households was observed, apparently because the total amount of food—including the subsidy—was shared by more people.

Program Leakages

Several forms of leakages were observed in the initial six months of the pilot project. First, because the program does not discriminate among target households within a village, nondeficit (mostly higher income) households in these villages are included in the program. Leakages are low if the large majority of the households are calorie deficit. The efficiency of targeting is therefore a function of the national agency's ability in identifying poverty areas. From the food consumption survey conducted just prior to the discount enforcement, it was found that on the average about 10 percent of the households were considered nondeficit; thus the targeting is relatively efficient.

In two villages in the south, moreover, a number of economically well-off households were observed to have shared their ration with their poorer neighbors, thus reducing leakages. Some richer households allowed their poor neighbors the use of their food discount cards, although discount cards, strictly speaking, are not transferable. These transactions, which were done with the knowledge of the store owners, involved no monetary compensation.

During the first six-month monitoring period, some cases of subsidized food reselling were observed. All of these cases involved the reselling of cooking oil, which was attractive for the very poor families because the product commands a good price in the open market. For instance, a family of six with a monthly allocation of fifteen cups of cooking oil (one cup = 160 grams) stands to gain about fifteen pesos if it sells all its quota, an amount that is almost equal to half a day's wage. There was practically no

resale observed in the case of rice, mainly because rice is a staple food and the ration for each family was only about half of what a typical household consumes.

In two villages in the north, several enterprising households used all of their cooking oil ration in their small native delicacy business and not for home consumption. In a number of instances, some retailers preempted the rations of households that did not consume all of their quota for the month. These practices were particularly difficult to check, because the retailers could forge signatures in the sales book records, and monitoring by the extension officers could be done only once a week.

The leakage as a percentage of the volume of food distributed was estimated from the monitoring reports of field extension workers: reselling, 3 percent for cooking oil only; leakage to nondeficit households, 10 percent; and leakage at the source (the store), 5 percent.

Use of Food Discount Cards

Certain problems were encountered in the use of the ration cards in the retail stores. Two signatures were needed for every sales transaction in the store: the retail store owner had to sign the ration card and the cardholder had to sign the store sales book. This procedure delayed the time it took to complete a sales transaction, especially in stores serving large populations.

Another administrative problem in the procedure was traced to illiterate beneficiaries who could not sign the sales book. For this group, about 8 percent of the target households, a thumb mark was used to carry out the transaction.

In the first two months of the experiment a number of the participants deliberately changed the ration amount stated in the discount cards by tampering with the figures on the cards. These were easily detected in the monitoring of the stores.

Accountability and Controls

In the first six months of the experiment, the plan to have local banks reimburse retail store owners proved to be practical. The special savings deposit provided a convenient procedure for the redemption of the subsidies by the store owners. Because the size of the subsidy was predetermined from the potential number of beneficiaries, the amount transferred every month by the program into the deposit accounts was accurate to within 94 percent of the actual subsidies.

The weekly auditing of the books in the store presented some difficulties at the start of the project, but once the extension officer and the retailer became familiar with the procedures, the accounting tasks pro-

gressed without exceptional problems. Part of the difficulty in the auditing procedure could be traced to the small quantities purchased by households at a time, which entailed several entries in the discount cards and which were therefore not easy to reconcile with records from the sales book.

To prevent fraudulent use, each discount ration card was coded, which proved to be an efficient system of control. Mothers were made aware that their ration cards were nontransferable.

Administration of Food Outlets

The procurement and selling performance of the accredited neighborhood stores varied by area. The differences in the efficiency in servicing the program recipients were dependent on a number of factors.

SIZE OF POPULATION SERVED. The outlets in Antique, which served a larger clientele, experienced more difficulty than those in the other two provinces. The queuing and crowding in the stores, especially during heavy buying days, resulted in several bookkeeping errors in these larger villages. From an interview with all the owners of the retail outlets in the experiment, it was concluded that, given the frequent purchasing habits of households, the optimum number of households each storekeeper can efficiently handle is about 120. This assumes that the store is attended by the store owner and an assistant, usually a member of the family or a relative.

FREQUENCY OF PURCHASE. In most areas it was observed that poor households tend to make frequent purchases but in small quantities. Many households, for example, buy cooking oil as frequently as two times a day, and the purchase may be as small as a half cup. Store records indicate that 28 percent of all households make daily purchases. These practices often increase the transaction time in the stores. Most stores report heavier selling late in the afternoons when mothers have arrived home from work or when the day's fish catch has been sold.

REVOLVING CAPITAL AND SUPPLY OF CREDIT. Stores that had more than P10,000 (U.S. $900 in 1983 prices) of revolving capital were found to be effective in maintaining uninterrupted day-to-day selling operations. On the other hand, smaller stores were observed to experience intermittent shortages in the supply of the commodities. Although a weekly credit line was available from commercial rice wholesalers, the amount allowed depended on the initial capital of the store. Hence, smaller stores were not really assured of sufficient credit to meet the demand. On the basis of six-month store records, it is estimated that a retail outlet needs an initial revolving capital of about P10,000 to support a client base of 120 families.

CREDIT TO CONSUMERS. It was a common practice in neighborhood stores to give weekly credit to regular clients. Larger stores offered credit on the subsidized food, but smaller stores did not because of limited revolving capital.

LOCATION OF THE STORE. Families located on the fringes of the subsidized villages experienced difficulty in obtaining subsidized food from the stores because of physical distance. These families usually made one-time (bulk) purchases to save on transport cost. Transport costs increased the total food acquisition cost of these beneficiaries. Geographical dispersion of target households should therefore play a crucial role in the choice of outlets for the program.

CHARACTER AND COMMUNITY ACCEPTANCE OF RETAILERS. In some instances, neighborhood politics hindered the program's delivery mechanism. In Abra, for example, one retailer refused to sell subsidized rice to constituents not belonging to her political party. Another store owner refused to sell to people who had a long-standing feud with her family. Some ethnic groups were not properly attended to in the stores in South Cotabato and were effectively denied their subsidized rations. However, most of the retailers were observed to be quite sensitive to community needs, even opening their stores late at night in order to serve their clients. Based on this experience, it is apparent that one of the important considerations in selecting an outlet is community acceptance of the retailers.

Household Food Purchasing Behavior

Records compiled at the stores for the initial months of the experiment indicate a take-out rate of only 85 percent of all rations. Households that did not get all of their subsidized food rations were observed to be those that (1) had insufficient available cash during the month; (2) were growing rice; or (3) were too far from the stores to be able to take advantage of the lower price.

The rate of ration utilization, however, varied by commodity. In the first month, approximately 92 percent of all rice rations were bought, but only about 80 percent of cooking oil rations. The reason for this difference probably lies in the amount of the commodity consumed prior to the subsidy. As mentioned earlier, less rice is included in the subsidy than a household typically consumes, whereas the cooking oil ration is larger than the amount consumed before the program. Under these conditions, households can be expected to consume all of their rice allocations, but they may decide to buy only as much cooking oil as they used before, unless they intend to resell the product. Cooking oil is an occasional food among the poor, and its acceptance as a program commodity is expected to be quite slow.

Program Administration and Monitoring

The pilot study clearly demonstrated that attainment of program objectives depends on adequate understanding by program participants of

the program's objectives, mechanics, and benefits, as well as retail store owners' understanding of program procedures.

Substantial social preparation activities were conducted by the home management technicians of the local Ministry of Agriculture, assisted by the paraprofessional village-based workers called Barangay Nutrition Scholars. Monitoring of retail stores and program participants was done by the home management technicians during their regular visits to the project areas. Prior to implementation, village assemblies were held to explain the program's mechanics and objectives. These assemblies were undertaken with the cooperation of local councils in the project areas.

Nutrition education classes were conducted regularly for mothers in the program areas where nutrition education was included as a companion intervention to the subsidy program, mainly to promote the use of cooking oil.

The home management technicians devoted two to three days out of their five working days in a week to the project. The project monitoring therefore subtracted from the time the home management technicians normally spent on villages.

Program Cost

The financial cost of the program consists of three main components: food subsidy cost, cost of the incentive paid to the retailers, and administrative overhead.

The food subsidy cost represents the difference between the wholesale price of the commodities and their corresponding discounted price under the program. The variation in the food subsidy cost from outlet to outlet is due mainly to the differences in transport cost. Outlets closer to marketing centers had lower procurement costs. The administrative overhead covers part of the salaries of the extension workers, who devote 50 percent of their time to the project, salaries of paraprofessional extension workers, travel costs for monitoring officers, salaries of central office project administration, printing costs for the discount cards, and costs of supplies.

The cost per beneficiary of the program is calculated at P8.69 per month (U.S. $0.79 in 1983 prices). About 83 percent of this is food cost, and about 17 percent is accounted for by the cost of administration (9.4 percent) and retailers' incentive (7.2 percent). (Garcia and Pinstrup-Andersen, 1987).

Among the factors that contribute to the relatively lower cost of delivery of the program, the commodity mix is quite important, because rice and oil are the cheapest source of calories in the country. Besides being locally produced, these commodities are available in almost all parts of the country. These foods are also bought in raw form (unlike the processed weaning foods of the Colombia food subsidy program).

Another crucial factor is the substantially lower percentage of administrative costs—about 14 percent of the total cost. These costs are relatively low because targeting by geographical area eliminates the burdensome and costly procedure of screening beneficiaries. The subsidy program in Colombia, for example, is narrowly targeted to preschoolers and pregnant or lactating mothers. In addition, the administrative costs in the Philippine program are an add-on cost, because the delivery system is built upon an existing infrastructure of extension officers, who typically devote part of their working week to the project without substantial diversion from their normal duties.

Income Transfer and Nutrition Effects

Preliminary estimates from a survey of the program areas after two months of operation indicate that the implicit income transfer embodied in the food discounts amounts to about 9.1 percent of the incomes of households earning less than P5,000. The implicit income transfer is equivalent to the difference between the opportunity cost of the commodities and the price of the subsidized rations multiplied by the respective ration quantities.

The transfer in percentage of total household income was highest among the lowest income class in all the project areas, as shown in table 14.1. In area 2 of Antique, the subsidy was limited to cooking oil; hence the contribution to total income was estimated at only 3 percent in families earning below P5,000 per year.

The importance of consumer food subsidies is pronounced among

TABLE 14.1 Share of income contributed by the subsidy, by income group, the Philippines

Income Group (pesos)	Abra	Antique		South Cotabato
		Area 1	Area 2[a]	
<5,000	7.6	9.3	3.0	10.3
5,000-5,900	5.8	7.8	2.2	9.2
6,000-6,900	5.2	7.7	2.0	8.7
7,000-8,900	5.2	6.5	1.7	7.4
9,000	2.9	4.7	1.1	4.5

SOURCE: Data from the International Food Policy Research Institute and the National Nutrition Council, Philippines, Subsidy Project Monitoring Office, Food Consumption and Nutrition Survey, 1983.

[a]Only cooking oil is subsidized.

households that depend on seasonal incomes from agriculture or fishing, inasmuch as their available cash income is not constant from week to week. For the sustenance fishermen in Antique, for instance, the value of the subsidies accounts for more than 30 percent of their available cash income during off-season days, but may be as low as 3 percent of their available cash income during the good fishing season.

The income transfers, which amount to P7.50 per person per month, are estimated to contribute about 8 percent of the total calories consumed by the households, or approximately 140 calories per adult equivalent per day.

Conclusions and Policy Implications

The pilot study provided valuable insights, which could be useful in designing and administering a larger scale consumer food subsidy program, at least in an environment similar to that of rural areas in the Philippines.

Selecting impoverished areas to receive food subsidies appears to be a logistically feasible and low-cost form of targeting. The administrative cost of this pilot program is estimated to be less than half that of similar subsidy programs in Colombia, Brazil, and Indonesia. The viability and replicability of the area targeting scheme, however, hinge on the precise identification of poverty areas or villages and a high concentration of poor households in these areas.

There were three other crucial elements that helped to keep the cost of the program low: first, the choice of commodities (rice and cooking oil) providing the cheapest source of calories; second, the use of an existing administrative infrastructure to monitor the program; and third, the mobilization of the private sector in the procurement and ultimate distribution of the subsidized food.

Leakages of benefits to nondeficit households were not totally eliminated, although these were kept low through supporting programs like monitoring, nutrition education, and adequate social preparation. The estimate of food leakage to those not in need is placed at about 18 percent of all food transferred.

The privately owned neighborhood variety stores, present in almost all villages, were found to be viable outlets for the subsidized food. For successful and uninterrupted operation, however, it is necessary for these stores to maintain a minimum operating capital, which was determined to be P10,000 (U.S. $900 in 1983 prices) in the pilot program. It was also determined that one outlet is necessary for every 120 families. Local idiosyncrasies and neighborhood politics should be considered in the selection

of these stores. The store owners' character is crucial to the success of a consumer food subsidy. Location of the stores also needs to be considered.

The program appears to be an effective means of immediately benefiting the poorest households. The subsidy is estimated to have contributed 8 percent to the daily calorie consumption of the households in the pilot program.

15 Structure, Costs, and Benefits of Food Subsidies in Bangladesh

RAISUDDIN AHMED

Food subsidy is an important element of public policies in Bangladesh. Direct public intervention in foodgrain distribution, now being practiced in Bangladesh, can be traced back to its origin in the 1941-44 wartime food policies of the government of British India in general and of the government of Bengal in particular. War-related disruption in the internal marketing structure, public spending, short supplies, and panic all combined to cause a spiraling of food prices (Sen, 1981). In the wake of impending famine, the government initially reacted by setting maximum prices and coordinating movement of supplies from surplus to deficit areas through private marketing channels. As the situation slipped from bad to worse, a Food Department was created in the central government in December 1942, and state governments were asked to organize procurement and distribution machineries. Distribution facilities, such as fair-price shops and ration shops, were located mainly in big cities, particularly Calcutta, in industrial areas, and in areas where military works were under construction. After the famine, the rationing system was further strengthened and gradually extended to other principal cities of Bengal. These extensions as well as subsequent measures are indications that the government learned a lesson, perceiving that it could have handled the famine situation better had there been a public distribution system in place beforehand (H. Knight, 1954).

The present public distribution system in Bangladesh is largely a continuation of the old system, although a number of modifications reflect circumstantial changes. The objectives of the program are still heavily weighted toward urban public employees, including police and army personnel, industrial workers, and urban consumers in general. The burgeoning nonagricultural rural population has, however, started to evoke national concern and to influence public food subsidy programs in recent years.

This chapter provides a brief but substantive account of the structure, costs, and benefits of the foodgrain subsidy system in Bangladesh. For the sake of brevity, the chapter does not discuss the many analytic foundations underlying the conclusions presented.

Structure and Conduct of the Program

It is often the structure and conduct of a system that provide the first approximation of who receives the most benefits and who bears the brunt of the costs of a public program.

Size of the Program and Sources of Supply

Public distribution comprised about 9.3 percent of total grain supply in the second half of the 1960s. This share rose to 16 percent in the first half of the 1970s and has declined to about 14 percent in the early 1980s. The increase in the share during the early 1970s can be attributed to the abrupt expansion after the civil war and the subsequent rigidity in downward adjustment once the program was expanded. Whereas most of the foodgrain subsidy program was dependent on imports before 1975, import dependence has declined from about 97 percent in the late 1960s and early 1970s to about 76 percent in the late 1970s and early 1980s. This is partly a reflection of domestic price support measures and partly an increase in production. The decline in the share of imports in total public distribution does not, however, imply an equally sharp drop in absolute import levels. Imports fell from an average of 1.75 million tons during 1973–76 to an average of 1.53 million tons during 1977–82.

A large proportion of the imported foodgrains was received under concessional arrangement. During 1973–82, annual imports of foodgrains paid for with the government's cash foreign exchange resources ranged from 2 to 15 percent of total foodgrain imports.

Distribution Mechanisms

Public foodgrain distribution is conducted through three principal mechanisms: the food-for-work program, open-market sales, and rationing. Free distribution of food in an emergency situation constitutes a fourth minor component, known as relief distribution. A detailed account of foodgrains distributed under these mechanisms during 1973–82 is shown in table 15.1.

The food-for-work program undertakes the construction of rural roads, canals, and embankments from January through June, when about one-third of the rural labor force is under- or unemployed (Osmani, 1984). The share of foodgrains under this program doubled to about 20 percent

TABLE 15.1 Public distribution of foodgrains, by category of subsidy, Bangladesh

Category	Average Quantity 1973–76 (1,000 tons)	Average Share 1973–76 (percent)	Average Quantity 1977–82 (1,000 tons)	Average Share 1977–82 (percent)
Food-for-work	150	8.4	300	15.0
Open-market sales			150	7.5
Total rationing	1,570	87.4	1,506	75.0
Statutory	460	25.6	365	18.2
Modified	640	35.7	310	15.4
Priority	105	5.8	336	16.7
Government employees	180	10.0	260	13.0
Large industries	75	4.2	120	6.0
Flour mills	110	6.1	115	5.7
Relief	75	4.2	50	2.5
Total subsidy	1,795	100	2,006	100

SOURCES: R. Ahmed, 1979; Hossain, 1984.

NOTE: Open-market sales were not in operation until 1979.

during 1977–82, compared to only 8 percent of total public distribution in 1973–76.

Open-market public foodgrain distribution is based on the understanding of a close relation between public distribution and free-market price determination (R. Ahmed, 1979). The concern for an increasing number of nonfarm rural consumers, who generally are harmed by wide swings in seasonal foodgrain prices, is one of the principal reasons for initiating this mechanism in 1979.

Rationing constitutes the largest mechanism for public distribution of foodgrains. About 75 percent of all public distribution during 1977–82 and 87.4 percent during 1973–76 were channeled through rationing systems. Rationing is organized around six categories, each representing a group interest in the political power structure of the society.

Statutory rationing supplies foodgrains, at given prices and quotas, to about 70 percent of the population legally residing in six major cities of Bangladesh. The population of the statutory rationing areas in 1975/76 was 5 million out of a total population of 85 million. Each recipient in the statutory rationing area holds a ration card that gives that person the right to make weekly purchases at designated ration shops.

Modified rationing is designed for people in rural areas and towns other than the six statutory cities. Access to the modified rationing is theoretically based on the amount of union council (local) taxes paid by households, so that high-income groups are excluded from the system. But be-

cause there are no comprehensive reporting system or reliable tax documents, targeting of modified rationing to the poor is almost nonexistent (World Bank, 1979). Rationing to priority groups targets recipients in the military and police departments and institutions such as jails, hospitals, and student hostels. Individual ration cards are not used in this system. The government employees category includes only those employees who are neither in the statutory areas nor in the priority groups.

Allocation of foodgrains to the various categories of rationing are made by the Food Department in consultation with the cabinet-level Food Policy Committee. As shown in table 15.1, shares as well as absolute quantities of foodgrains under statutory and modified rationing have declined over time. The decline in modified rationing, however, has been sharper than in any other category. The coefficient of variation of distribution under modified rationing is about twice that for total and statutory rationing, indicating the unstable and residual nature of allocations for this category.[1] The disposal of foodgrains under the priority category has increased the most over time. Food-for-work allocations have also increased, partly compensating for the decline in the share of modified rationing in rural areas.

Operating the System

The government has developed an elaborate marketing structure for procurement (from both domestic and foreign sources), storage, transportation, and distribution to consumers. In the conduct of public distribution, ration prices and quotas represent two powerful instruments for influencing the volume of distribution and the free market prices of grains. When ration prices are raised, the difference between the market price and the ration price closes, thus reducing the incidence of subsidy. Consumers shift from purchasing rations to purchasing supplies on the open market, which exerts upward pressure on market prices (see R. Ahmed, 1976, for a quantitative evaluation of this relation). This pricing instrument has been used rather extensively to reduce the scale of modified and statutory rationing in recent years.

Costs of the Program

Devising an optimal solution by balancing the benefits and costs has limitations in the evaluation of food subsidy programs. Such an approach poses a serious problem when someone's welfare is enhanced at someone else's cost. The concept of cost effectiveness is, however, very relevant, and

1. Coefficients of variation for total distribution, statutory rationing, and modified rationing are 0.38, 0.34, and 0.62 respectively (1968–69–1980–81).

an assessment of direct and indirect costs and benefits provides ample information to policymakers on trade-offs and ways to achieve cost effectiveness. The costs of a food subsidy program can be viewed as direct subsidy costs reflected in the government budget, that is, fiscal costs and indirect costs to producers and the economy at large.

Budgetary Subsidy Costs

Calculating the fiscal costs of a foodgrain subsidy is complicated for a number of reasons. First, the sources of supply—whether commercial or concessionary imports or domestic procurement—have widely differing implications in budgeting for the subsidy. Second, accumulation of stocks or sales from past stocks could cause annual budgetary estimates of the subsidy to be uneven, although the real content of the subsidy is stable. Third, the question of inclusion or exclusion of food-for-work foodgrains in subsidy calculation is problematic. Food-for-work payments may logically be treated as wages for construction of rural infrastructures.

Two budgetary estimates are presented in table 15.2. Budgetary subsidy 1 includes only grains bought—both internally and from abroad—with the government's own resources and sold during the fiscal year in question. This estimate does not include any revenue from aid-related imports or costs incurred for them. Subsidy 2 includes all foodgrain accounts—those purchased with the government's own resources as well as those purchased with aid and grants, if any, in a financial year. Food-for-work program costs and revenues are, however, excluded from both estimates. The figures under subsidy 2, therefore, reflect the overall financial position of public purchases (including handling of aid) and sales of foodgrains as reflected in the budget.

From the table it is apparent under subsidy 2 that subsidies are a small part of the overall food account of the government: the government

TABLE 15.2 Budgetary subsidy on the foodgrain account, Bangladesh

	Subsidy 1, Excluding Food Aid			Subsidy 2, Including Food Aid		
Year	Million Taka	Million U.S. $	Proportion of Government Budget (percent)	Million Taka	Million U.S. $	Proportion of Government Budget (percent)
1977/78	1,060	(−68.4)	10.0	357	(−23.0)	3.4
1978/79	952	(−61.4)	8.0	+1,009	(65.1)	8.5
1979/80	1,150	(−74.2)	11.0	350	(−22.6)	3.4

SOURCE: Data from the government of Bangladesh, Ministry of Food.

NOTE: A negative sign means loss to the treasury and a plus sign means gains to the treasury.

may even show a small gain on its food account when the figures are averaged over a number of years. However, when the foodgrains under aid arrangements are excluded, the budgetary subsidy on foodgrains procured domestically and imported under the country's own cash resources is substantial. About Tk 1 billion (U.S. $65 million) was required annually for such subsidies during 1978–80. About 70 percent of this annual subsidy was, however, incurred in domestically procured foodgrains (World Bank, 1979). Therefore, the budgetary subsidy reported by the government on the foodgrain account (subsidy 1) goes to producers and consumers in almost equal shares. A food subsidy of Tk 1 billion roughly corresponds to a subsidy incidence of Tk 11 per capita per year (or $0.71 per capita at the 1980 exchange rate).

Although the analysis above covers only three years, indicators of principal determinants of subsidy for recent years imply a substantial decline in the level of food subsidy. Thus the prices in ration shops increased 135 percent for rice and 95 percent for wheat between 1977/78 and 1983/84. This compares with a world rice price increase of 60 percent (in Bangladesh currency) between the same two points in time. The domestic procurement price has increased by 70 percent and the free-market price of rice has increased by 95 percent during the same period.

Economic Costs

Economic costs as defined here differ from budgetary costs on several counts. First, the cost of acquisition of foodgrains is imputed using a price based on the principle of opportunity cost. Thus grains obtained with food aid are also costed at full economic price. Second, accumulation or depletion of stock is disregarded; costs and revenue relate only to the quantity distributed in a fiscal year. Third, in the case of imported grains, both official and shadow exchange rates of Bangladesh currency via-à-vis foreign currencies are used to show the extent of implicit subsidy from overvaluation of the exchange rate.

Foodgrains, imported as well as domestically procured, are valued at world prices on an import parity basis. The argument that domestically procured rice should be valued at world prices on an export parity basis is ignored on the assumption that Bangladesh would not pursue a policy of importing wheat and exporting rice. However, the nominal protection coefficients of rice (the domestic-to-world price ratio) calculated on the basis of export and import parity differ widely (1.10 for export parity versus 0.83 for import parity in 1978/79, for example).

The calculated economic cost during the fiscal years 1977/78–1979/80 increased from Tk 1.838 billion to Tk 2.603 billion (equivalent to U.S. $119 million and $164 million at the official exchange rate). The incidence of cost (per unit) on rice is larger than that on wheat. Economic costs (at

the official rate), as a percentage of full cost, varied from 11 to 48 percent for rice and about 14 to 22 percent for wheat. Except for 1975/76, most other years in the 1970s showed a similar pattern. Wheat is more expensive relative to rice in the rationing system than in the world market.

Food Subsidy and Agricultural Incentives

The conventional position that a policy of low foodgrain prices has been a factor in agricultural stagnation in Bangladesh does not appear to be valid. To make an objective assessment of whether domestic prices have been low or high, one has to use a reference price for comparison. Instead of following the conventional approach of examining the cost of production and profitability as indexes of incentives, the world price is used on the assumption that world price defines the upper bound of incentives that a society can optimally offer to producers of a product on the grounds of efficiency.

At the official exchange rate, domestic rice prices appeared to be 10 to 15 percent lower than world prices during 1975-83. This does not imply that a 10 to 15 percent profit can be made by exporting rice from Bangladesh. Domestic rice is sold in bulk, and its price, like the world price, does not include sacking cost. Quality differences between domestic and foreign rice can be substantial. Moreover, world price statistics represent general market quotations; actual prices at which rice is purchased usually reflect a 5 to 10 percent discount. The price of rice actually paid by the Bangladesh government to Thai exporters was lower than the published general world price by 19 percent in 1977/78 and 22 percent in 1978/79 (Hossain, 1984). Therefore, it can clearly be claimed that prices of foodgrains in Bangladesh have generally been at world levels, with official exchange rates providing optimal incentives to producers. But because exchange rates are overvalued, tradable products in general may be underpriced. Simple comparison of nominal prices does not capture the effective incentive implication, however, because input subsidy is widespread in Bangladesh. The amount of subsidy on fertilizer in 1977/78 was Tk 1.18 billion (U.S. $76 million), which was 11 percent higher than the subsidy on foodgrains in that year (World Bank, 1979). The subsidy for irrigation investment and credit is equally large. It must be added that the input subsidy has been reduced substantially in recent years, while the support price for rice has been raised commensurately.

Even assuming that the disincentive effect of lower foodgrain prices was large, it would have a large effect on production only if the supply response in agriculture is large. Studies indicate that long-run supply elasticities range from 0.13 to 0.30 in foodgrains (Cummings, 1974; Hossain, 1984; R. Ahmed, 1981). Thus the production response to lower producer prices is by no means negligible.

Who Benefits from the Program?

The structure and conduct of the distribution system provide a basis for a first approximation of who benefits from the food subsidy program and by how much. Modified rationing supplies foodgrains to rural consumers as well as to town dwellers outside the big cities. Other rationing devices are generally meant for urban consumers, particularly government employees, police and military personnel, and industrial workers. Open-market sales benefit those who have to depend on market supply and prices. In addition to these structural factors, the composition and quality of the foodgrains supplied through the system have some targeting effect. About two-thirds of the subsidized foodgrains is wheat, and consumers in Bangladesh prefer rice to wheat. The quality of the rationed rice is also considered to be inferior (broken, spoiled, and not parboiled) to medium-quality market varieties.[2] These quality factors have influenced poorer households to stick to subsidized foodgrains more tenaciously than richer households. However, easy fungibility of rationed foodgrains in the open market has tended to diffuse the targeting effect of inferior grains (R. Ahmed, 1979). The principle of targeting through supply of inferior grains was experimented with in one area through distribution of sorghum (Karim, Majid, and Levinson, 1980), but the experiment, though supposedly successful, was never implemented on a large-scale basis.

No direct surveys have yet been conducted to measure how much subsidized foodgrains are received by whom. The distribution of subsidized foodgrains to households of various incomes was estimated on the basis of 1973–74 household expenditure surveys and various other information (R. Ahmed, 1979). A number of important conclusions are derived from these results.

First, rationing has substantially supported the consumption of foodgrains of the urban poor. Rationing provides 90 to 100 percent of the foodgrains of low-income urban consumers, whereas it provides only 9 to 14 percent of the foodgrains of rural low-income consumers. Without the food subsidy, consumption of foodgrains among urban low-income households would have been about 14 to 19 percent lower than they were.

Second, the estimates of ration distribution for 1973–74 show that the 9.2 percent of the population that is urban received about 55 percent of the total rationed foodgrains and that the remaining 90.8 percent of the population, which is rural, received only 45 percent. Excluding the special rural-based categories, such as government employees, school teachers, mili-

2. Consumers in Bangladesh prefer parboiled rice, which is generally not available in the world market. Deterioration in quality in public stores is a common phenomenon because of poor storage conditions and inadequate facilities for drying the grains with high moisture content typically procured from domestic sources.

tary and police services, and industrial workers (who are urbanlike in their occupation, income, and consumption patterns, but who live in rural areas), the share going to native rural consumers was only about 34 percent. Even this estimate is considered to be high by many who know the system well. The rural poor earned less than Tk 300 (U.S. $37) per month per household in 1973–74; yet as a group they are estimated to be 2.6 times larger than the entire urban population in Bangladesh.

Are these conclusions on the distributional patterns of the food subsidy in Bangladesh still valid after a decade? On the basis of fragmentary evidence, it seems that the picture has remained largely the same.

Food for Work

Foodgrains distributed through the food-for-work program go entirely to rural areas. The share of this category has increased from 8 percent to about 16 percent of total public distribution during the last decade. In absolute terms, this increase amounts to between 150,000 and 200,000 tons. A recent evaluation of the program reveals that about 70 percent of the participants in the program are functionally landless, with per capita income less than half of the national average. Net income earnings of participant households are 55 percent higher in the working season than they would have been during the same period without the program. The evaluation estimates that the net income gains of workers from the program amounts to 10–11 percent of annual wage income and 7–8 percent of total annual income (Osmani, 1984).

Rationing

As pointed out earlier, the total quantity of the ration has not increased over time. However, the decrease in both modified and statutory rationing and the increase in the share and absolute quantity under priority and other special categories do bear important distributional consequences. These changes imply that rationed foodgrains have helped to tilt the advantage to urban consumers. But when rations and food for work are considered together, the present rural-urban balance appears to be the same as that in 1973/74. Among urban consumers, however, the shares of priority groups (army, police, government employees) have increased dramatically, perhaps at the cost of other urban consumers (see table 15.1).

Open-Market Sales

The fact that the same amount of foodgrains supplied through the open market has a sharper effect on market prices than if supplied through the rationing system (because of the income effect of the subsidy) is the basis of open-market sales (R. Ahmed, 1979). These sales are designed to check prices in peak season. Together with procurement from farmers in

harvest season, such sales constitute price-stabilizing instruments. The volume of open-market sales has expanded rather sharply in recent years. The rural nonfarm population, which is almost double the size of the urban population, and deficit farmers are extremely vulnerable to severe fluctuation in foodgrain prices, whereas urban consumers are relatively protected from such fluctuation by the rationing system. Based on this reasoning, open-market sales as conducted in Bangladesh are considered to be more beneficial to the poor than to the rich. In fact, it is argued that the rationing system should be replaced by a more vigorous stabilization program involving open market sales and procurement (Reddaway, 1984).

In normal years and in smaller crises, open market sales have been able to curb the rational but speculative practices of traders and thus effectively influence market prices with a relatively small quantity of grains (Montgomery, 1983). However, the effectiveness of open-market sales in famine years has yet to be tested. It is not likely that these sales, with a modest stock, can effectively control prices in famine situations.

Conclusions

The public foodgrain distribution program in Bangladesh has a strong urban bias. The system largely benefits urban public employees. Low-paid employees, industrial workers, and other poor inhabitants of major cities derive subsidy benefits equivalent to 12 to 15 percent of their income. In some sense, the subsidy is a wage support. The system has been criticized on the basis of the opportunity cost of resources spent on the food subsidy and the indirect effect of the program on incentives to domestic production. Evidence pertaining to recent years is not supportive of the disincentive-effect hypothesis. Domestic prices of foodgrains are in fact comparable to world prices. Moreover, the subsidy on agricultural inputs is at least as large as the food subsidy. Actual budgetary costs on food have, however, remained very small or negative because of food aid; food aid as well as fertilizer aid (fertilizer received from donor as grants) has directly or indirectly paid for the input subsidy and for price supports to producers.

If the food subsidy was eliminated, would the resources thus saved be allocated to agriculture or to luxury consumption? What is the difference in the role of the rationing system in normal years compared to famine years? So long as these questions are not answered satisfactorily, elimination of food rationing from Bangladesh may be neither an easy task nor a clearly understood decision.

16 Costs and Benefits of Food Subsidies in India

P. S. GEORGE

Government interventions in foodgrain markets have existed in India in one form or another for about four decades, starting during the Second World War. Because supplies from Burma were cut off during the war, price controls and movement restrictions were introduced by the government; subsequently, other measures were added with a view to providing a minimum supply at subsidized prices. The major components of the government's food management policy over time have included procurement from domestic producers, monopoly imports, trade regulations, price controls, food distribution through fair-price shops, and buffer-stock operations (Chopra, 1981; Gupta, 1977; H. Knight, 1954; and Wall, 1978).

Agencies Involved and Their Functions

The central government of India, state governments, and a number of other agencies are involved in arranging procurement, movement, storage, and distribution of foodgrains. At the central level, the Department of Food provides policy directions and general supervision, and the Food Corporation of India (FCI) handles procurement, imports, storage, and distribution. The procurement and sales prices of foodgrains from the central pool are determined by the central government on the basis of recommendations from the Agricultural Prices Commission and views expressed by the National Development Council. Some of the state corporations act as agents of the FCI for procurement and internal distribution. Many state governments have their own food and civil supplies departments. In some areas, producer cooperative societies are involved in procurement, and consumer cooperatives are involved in distribution.

In recent years, procurement has been undertaken mainly under price support operations. However, when the government had difficulties in obtaining adequate quantities for public distribution, compulsory means—such as monopoly procurement; a levy on farmers, millers, and trade; and

preemption—were adopted. The states have used different procurement methods for different crops and have changed these methods from year to year.

Up to 1977 there were frequent restrictions on movement of foodgrains by private traders between states or even between regions in a state. Zoning regulations were created primarily for the administrative convenience of procurement. The huge inventory accumulated during 1977 has enabled the government to remove all movement restrictions.

In certain cases, the FCI acts as the wholesale agent for both procurement and distribution. At the state level, foodgrains are distributed through licensed retail shops, known as fair-price shops or ration shops. The extent of coverage of fair-price shops and the eligibility for purchases from these shops are determined by the state governments. Transport charges, commission to the retailers, and price of foodgrains at the wholesale and retail levels are fixed by the state governments.

Volume Handled

Procurement

During the last twenty years, the volume of procurement has increased substantially from 1.1 million metric tons in 1963–64 to 15.5 million tons in 1983–84, consisting of about 7.0 million tons of rice, 8.3 million tons of wheat, and 0.2 ton of coarse grains.[1]

Rice accounted for the major share of the total procurement during the early 1960s, but during the early 1970s wheat procurement exceeded rice procurement. Whereas procurement of rice accounted for 2.8 percent of rice production in 1963–64, this figure rose to about 15 percent by 1983–84. Wheat procurement increased from 1 percent of production in 1963–64 to about 19 percent in 1983–84. For total foodgrains, the share of procurement in total production increased from 1.4 percent in 1963–64 to about 11 percent in 1983–84. During 1980–81, about 35 percent of the rice and 60 percent of the wheat sold in the market was procured by government agencies.

About two-thirds of the wheat procurement in India came from Punjab. Haryana, with 16.9 percent in 1983–84, and Uttar Pradesh, with 17.4 percent in 1983–84, were the other important states accounting for wheat procurement. Punjab contributed about 48 percent of the rice procured in 1983/84. In Punjab, half the wheat produced and about 80 percent of the rice produced were procured by the government agencies.

During the 1960s and early 1970s, the government announced minimum support prices and procurement prices. The minimum support

1. All tons referred to in this chapter are metric tons; the procurement volume corresponds to marketing years.

prices were in the nature of a long-term guarantee to producers, and the procurement prices were the prices at which the required quantities for maintaining the public distribution system and for building up buffer stocks were actually purchased. During the mid-1970s, the practice of announcing minimum support prices was given up mainly because all quantities offered for sale were purchased at the procurement price. The procurement price of wheat increased from Rs 540 per ton during 1965/66 to Rs 1,510 per ton during 1983/84.[2] The procurement price of paddy (unhusked rice) increased from Rs 400 per ton during 1965/66 to Rs 1,320 per ton by 1983/84.[3]

The farm harvest price in many states was higher than the procurement price.[4] Punjab, where rice is not consumed in large quantities, was the only state where the farm harvest price of paddy was more or less the same as the procurement price. In Punjab, the gap between the market price of wheat and its procurement price was narrow. A large proportion of the annual variations in wheat procurement was explained by variations in wheat production. In the case of rice, however, production differences accounted for only a small percentage of the variations in procurement (George, 1983; Krishna and Raychaudhuri, 1980).

Offtake

In 1981 there were about 280,000 fair-price shops, an increase of 133 percent over 1971. The estimated coverage of these shops was 660 million persons, and on the average each shop catered to 2,335 persons.

During the early 1960s, the offtake (the amount of rations purchased by consumers) from the fair-price shops increased, reaching a peak of 14 million tons in 1966. The improved availability of foodgrains in the open market during the subsequent years reduced the dependence on the ration shops, but throughout the 1970s the total annual offtake remained about 10 million tons. The offtake rose again in the 1980s, reaching a record level of 16.2 million tons in 1983.

Wheat accounted for a major share of the foodgrains distributed through the fair-price shops. During the 1960s and 1970s, the offtake of rice from the public distribution system remained at about 3.5 million tons, and the offtake of wheat was subject to wide annual fluctuations, ranging from 4.4 million tons in 1971 to 8.1 million tons in 1966. The offtake of rice increased during the 1980s, so that by 1983 rice and wheat were both at about 8 million tons. The commodity composition over the years

2. The exchange rate was Rs 4.8 = U.S. $1 in 1965 and increased to Rs 10 = U.S. $1 in 1983/84.

3. At 1965/66 prices, the 1983/84 prices of wheat came to Rs 418 and that of paddy to Rs 364.

4. In this situation, government procurement involves some compulsory measures, such as a levy.

has reflected the relative availability of rice and wheat rather than consumer preferences.

The states of Maharashtra, West Bengal, Tamil Nadu, and Kerala accounted for about half the volume distributed through the public distribution system. The three major cities—Bombay in Maharashtra, Calcutta in West Bengal, and Madras in Tamil Nadu—accounted for a major share of offtake in these states. The extended coverage of public distribution in both the urban and rural areas accounted for Kerala's high share in the total distribution of foodgrains.

From 1966 to 1983, although the annual total offtake ranged between 7.8 million tons in 1971 and 16.2 million tons in 1983, the annual fluctuation in offtake was small in West Bengal and Kerala. The variations in Maharashtra and Tamil Nadu were also within 30 percent of the low offtake. Thus the offtake from the public distribution system remained more or less stable in urban areas and in areas with heavy deficits. In the other areas, dependence on public distribution was only during periods of shortages. In 1981 the average annual per capita supply of foodgrains through the public distribution system in India was twenty-two kilograms, ranging from six kilograms in Rajasthan to forty-seven kilograms in Kerala.

The issue price of foodgrains from the ration shops is determined by state governments, which take into account the issue price of foodgrains from the central pool and operating costs. Normally, state governments recover their full cost from the consumers. Open-market prices of rice and wheat indicate substantial annual and regional variations. In general, open-market prices in deficit states, such as Kerala, were much higher than the issue price. The gap between these two prices was relatively small in the surplus areas, such as Punjab. The monthly offtake of cereals from the public distribution system was influenced by the issue prices of rice and wheat and by the open-market price of cereals. The offtake of wheat from the system increased with the increase in the rice price in the fair-price shops and the ratio between the wheat prices at the open market and fair-price shops, and it decreased with the increase in the price of wheat in the fair-price shops.

Cost of Public Distribution

The cost of public distribution of cereals consists of both direct and indirect items. The direct items of cost consist of cash expenditures incurred by the central and state governments. The indirect items consist of a number of elements, such as the concessional rates of interest on bank loans for foodgrain purchases and implicit consumer subsidies through reduced procurement prices.

Because the procurement and issue prices of cereals are fixed by the

central government, the FCI has no control over them. In the past, the gap between the issue price and the procurement price was less than the handling costs incurred by the FCI. Moreover, the cost of imported grains was higher than the issue price. The gap between the costs incurred by the FCI and the amount realized through sales (the issue price) was met by the government of India as a consumer subsidy.

The cost of operating the FCI includes the handling cost of moving, storing, and distributing foodgrains and the cost of carrying stocks. The handling cost comprises the transportation charges in moving grains to the consuming centers, interest, handling expenses incurred at the godowns during receipt and issue, storage charges, storage and transit losses, and administrative overheads. Between 1974/75 and 1980/81, the handling costs doubled the 1974/75 rate of Rs 146 per ton. A major increase in handling costs took place in 1978/79, rising to Rs 251 per ton from the previous year's rate of Rs 148. Although it declined briefly to Rs 227 per ton during 1979/80, it rose to Rs 291 in 1980/81.

The size of the buffer stock maintained by the FCI on behalf of the government depends on a number of factors, such as local procurement, imports, and offtake from the public distribution system. While the FCI had practically no buffer stocks during 1974/75, by 1983/84 it had buffer stocks of about 7.1 million tons of foodgrains in addition to operational stocks of 5.[illegible] million tons. The cost of carrying buffer stocks varied from Rs 236 per ton during 1977/78 to Rs 349 per ton during 1975/76. The government reimburses the FCI for the cost of carrying buffer stocks.

The government subsidy increased from Rs 1,170 million in 1972/73 to Rs 8,350 million in 1983/84. The budget estimates for 1984/85 provided Rs 8,550 million for the subsidy. Although a breakdown of the subsidy is not available for the period prior to 1976/77, data for the subsequent years indicate that the consumer subsidy was higher than the cost of carrying buffer stocks. The actual share of these two depended on the quantity distributed and the size of the buffer stock (table 16.1).

The changes in consumer subsidy reflect the changes in procurement prices, procurement costs, handling costs, and issue prices. The subsidy on imported grains was much higher than the subsidy on locally produced grains, mainly because from 1973 onward the world-market prices of rice and wheat were higher than the domestic procurement prices. (Prior to 1973, the world-market price of wheat was below the procurement price.) Before 1977/78, wheat was subsidized, but there was a net profit from rice; since 1977/78, both rice and wheat have been subsidized. The gap between the consumer subsidy on wheat and that on rice has tended to decline.

The 1984/85 budget estimate of the economic cost per ton of rice, (including purchase, procurement incidentals, and distribution cost) was Rs 2,694.50, against Rs 2,411.20 in 1983/84. For wheat, the economic cost

TABLE 16.1 Annual cost to the government of the foodgrain subsidy, India (million rupees)

Year	Consumer Subsidy	Cost of Buffer Stock	Total: At Current Prices	Total: At 1972/73 Prices
1972/73			1,170	1,170
1973/74			2,500	2,175
1974/75			2,725	1,798
1975/76			4,037	2,503
1976/77			4,000	2,720
1977/78	2,999	2,630	5,629	3,490
1978/79	2,955	2,628	5,583	3,406
1979/80	3,242	2,653	5,895	3,401
1980/81	4,859	1,761	6,620	3,423
1981/82			7,000	3,150
1982/83			6,110	2,566
1983/84			8,350	2,588
1984/85[a]			8,550	

SOURCES: Food Corporation of India; India, *Economic Survey*.
[a]Estimated.

TABLE 16.2 Government cost of the consumer subsidy per ton of grain, India (rupees per metric ton)

Year	Wheat: Domestic	Wheat: Imported	Domestic Rice	All Commodities[a]: At Current Prices	All Commodities[a]: At 1975/76 Prices
1973/74	165.9	587.1	−19.5		
1974/75	16.9	533.3	−53.7		
1975/76	107.4	408.2	−81.5	264.3	264.1
1976/77	116.8	420.5	−73.2	207.4	224.0
1977/78	316.3		92.1	271.9	271.9
1978/79	327.2		190.6	297.8	265.0
1979/80	281.4		177.1	246.8	224.6
1980/81	402.0		340.3	376.6	285.5
1983/84	307.2		408.3		
1984/85[b]	313.4		458.7		

SOURCES: Food Corporation of India; India, *Economic Survey*.
NOTE: A negative sign indicates net gains.
[a]Includes rice, wheat, and coarse grains.
[b]Estimated.

per ton was Rs 2,201.90 for 1984/85, against Rs 2,022.80 in 1983/84. The budget estimates for consumer subsidy per ton of rice was Rs 458.70 in 1984/85, against Rs 408.30 in 1983/84; for wheat, Rs 313.40, against Rs 307.20 (table 16.2).

Indirect Subsidy

The FCI gets loans at concessional rates of interest for foodgrain trade. Further, working capital is provided by the government at concessional rates (Garg, 1980). An estimate of the interest subsidy gained by the FCI during 1980/81 is about Rs 940 million (George, 1985).

The portion of the consumer subsidy that is met by the producers is the difference between what the producers might have obtained in the absence of the public distribution system and what they actually received under existing marketing arrangements. The measurement of this involves a number of assumptions. If the price paid to farmers in the absence of procurement for the public distribution system is higher than the weighted average price received by farmers from open-market sales and sales to the government, procurement causes a net loss to farmers, but several studies have shown that this is not the case in India (Dantwala, 1967; Mellor, 1968; and Thamarajakshi, 1969). The findings of some empirical studies indicate that in the short run, when supply is inelastic, government procurement through levy may even increase the average producer price and income over the free-market equilibrium (Hayami, Subbarao, and Otsuka 1982; Subbarao, 1977). This is particularly likely to be true when procurement is made under price support operations in the surplus area (ignoring the distribution of benefits among regions).

In the absence of a public distribution system, the equivalence of the open-market price with the weighted price realized by farmers implies that consumers who purchase from the open market incur extra payments on account of the public distribution. It is estimated that the additional payment made by consumers on open-market purchases during 1980/81 was Rs 992 million (George, 1985).

It is difficult to determine whether procurement prices act as disincentives for producers. It has been argued that government intervention was a major reason for agriculture's poor performance (Schultz, 1964, 1978). The matter is very complex and account must be taken of the effects of fluctuations in world-market prices; lags in production adjustments; the inflationary nature of higher food prices; and the large government subsidy on inputs, especially fertilizers.

Data provided by the Ministry of Agriculture on cost of production in the major wheat-producing areas indicate that the procurement price was

higher than the cost of production.[5] The procurement price of paddy was very close to the cost of production in the major paddy-producing states. Output-input ratios at the procurement prices were more favorable to wheat producers than to rice producers. This was partially offset because, first, a much smaller percentage of production of paddy was procured than that of wheat, and second, the gap between the market price and the procurement price for paddy was much wider than that for wheat.

Data on profitability of input use, particularly fertilizers, indicate good returns on investment at the procurement price (Fertilizer Association of India, 1982). Because the procurement price has effectively become the minimum support price, it provides some stability in farmers' expected price. Considering all these factors, it appears that the procurement price did not offer any major disincentive for farmers.

Benefits of Public Distribution

The objectives of government interventions can be synthesized from various sources as (1) stability in availability of foodgrains, (2) stability in prices, and (3) equity in distribution.

The coefficient of variation of availability of foodgrains has remained stable during the last twenty years, in spite of production instability. There has been substantial variation in prices over time and over regions. The equity considerations involved in public distribution are reflected in transfers of income between regions and between income groups.

Although data on the quantities of foodgrains distributed in the urban and rural areas are lacking, some estimates have been made. In West Bengal, 54 percent of rations were distributed in the statutory rationing area of Calcutta and the rest in the modified rationing areas, mainly in the urban centers.[6] The cities of Bombay in Maharashtra and Madras in Tamil Nadu accounted for the major shares of the rations distributed in these two states. The amount distributed in the Union Territory of Delhi was also substantial. Kerala State and Jammu and Kashmir State were the only two states where the offtake from the rural areas was substantial. Thus it is estimated that urban areas received about 85 percent of the total foodgrains distributed by the government of India.

In the absence of reliable data on the economic status of buyers from the fair-price shops, data from available cross-sectional surveys were used

5. The study by Krishna and Raychaudhuri (1980) indicates that the wheat procurement price did not cover the cost of production in the 1950s, but in the late 1960s it allowed a margin of profit above full cost.

6. In the statutory rationing area, private trade in foodgrains was not allowed, and the government had the obligation to distribute foodgrains to all consumers. In the modified rationing areas, the government had no obligation to meet the foodgrain requirement, and private trade was allowed to function along with fair-price shops.

to obtain rough estimates of the effects of rationing. The results of some consumer surveys indicate the pattern of distribution among income groups (table 16.3). The pattern of distribution is biased in favor of the poor in Kerala and in favor of the better-off in Tamil Nadu, while the distribution in Gujarat is virtually equal to the distribution of the population.

The percentages for West Bengal, Maharashtra, and Delhi, which account for a major share of the rations distributed through the public system, are likely to fall within the range indicated for Kerala, Gujarat, and Tamil Nadu. Therefore, a rough approximation of the distribution of foodgrains from ration shops among the various income groups may be 65 percent to households with annual incomes of less than Rs 3,600, 20 percent to those in the Rs 3,600–4,800 range, and 15 percent to those with incomes of more than Rs 4,800.

The crucial variable for determining consumers' gains is the price consumers would pay in the absence of public distribution. The market-clearing price without rationing would be below open-market prices if rationing existed, because the ration system increases the purchasing power of consumers—and thus foodgrain demands—and procurement reduces open-market availability. Based on data on prices and quantities in ration shops and on the open market, an estimate of the market-clearing price was used to estimate gains to consumers.

Net gains have two components—one corresponding to purchases from ration shops and the other corresponding to open-market purchases. If rationing was abolished so that all consumers had to purchase on the open market, there would be additional expenses for the buyers from ration shops and savings for the buyers from the open market. The size of these differences for 1980/81 is shown in table 16.4.

If rationing was abolished, the quantities purchased from the ration shops would involve an additional expenditure of Rs 7,900 million, and at the same time there would be a reduction of Rs 992 million on the cost of open-market purchases, the net result being a gain of Rs 6,908 million.

TABLE 16.3 Distribution of rationed foodgrains among income groups in Kerala, Gujarat, and Tamil Nadu (percent)

	Kerala		Gujarat		Tamil Nadu	
Annual Family Income	Food-grain	Population	Food-grain	Population	Food-grain	Population
Less than Rs 3,600	86.8	59	56.6	57	50	65
Rs 3,600–4,800	7.6	20	23.5	25	20	22
More than Rs 4,800	5.6	21	19.9	18	30	13

SOURCES: George, 1983, for Kerala and Gujarat; Prabha, 1984, for Tamil Nadu.

TABLE 16.4 Value of rationed foodgrains at open-market and market-clearing prices, India

Item	Value (million rupees)
Actual payments	53,060
Rationed purchases	20,590
Open-market purchases	32,470
Value of rationed goods at open-market price	61,800
Rationed purchases	29,330
Open-market purchases	32,470
Gains[a]	8,740
Value of rationed goods at market-clearing price[b]	59,968
Rationed purchases	28,490
Open-market purchases	31,478
Additional payments on rationed purchases[c]	7,900
Savings on open-market purchases[d]	−992
Net additional payment[e]	6,908

[a]Value of rationed purchases at open-market price minus actual payments.
[b]Market-clearing price was estimated on the basis of prices prevailing in surplus production areas (see George, 1983).
[c]Value of rationed purchases at market-clearing price minus actual payments for rationed purchases.
[d]Value of open-market purchases at market-clearing price minus actual payments for open-market purchases.
[e]Value of rationed goods at market-clearing price minus actual payments.

The existing dual markets—public distribution and open markets—provide a ration income of Rs 7,900 million to buyers from the ration shops. Because 65 percent of rations is estimated to go to households with an annual income of less than Rs 3,600, the ration income to this group accounts for about Rs 5,135 million.

Ratio of Benefits to Government Costs

Both benefits and costs of public distribution are highly sensitive to a number of assumptions (Scandizzo and Swamy, 1982). Therefore, conventional methods of estimating costs and benefits with and without intervention may lead to incorrect conclusions.

The direct fiscal cost of public distribution is the consumer subsidy incurred by the government toward procurement and distribution, and the direct benefit is the ration income (savings to the consumers at the open-market price). At 1980–81 levels, the estimated consumer subsidy of Rs 4,859 million and the ration income of Rs 7,900 million indicate a benefit-cost ratio of 1.63.

When the indirect costs are considered, the interest subsidy to the Food Corporation of India and the excess payments to consumers who ob-

tain their supplies from the open-market become relevant items of cost. With interest subsidy of Rs 954 million and excess payment of Rs 992 million on open-market purchases, the economic cost of public distribution is Rs 6,805 million, implying a ratio of benefits to government costs of 1.16.

Effects on Nutrition

The effect of the public distribution of foodgrains on the nutrition of the beneficiaries in Kerala and Gujarat was estimated using data on purchases from the fair-price shops, prevailing price levels, and estimates of calorie intake from the National Sample Survey. The reduction in calorie intake that would occur if rationing was discontinued ranged from 46 to 224 calories per person in Kerala, and from 178 to 196 calories in Gujarat (table 16.5).

Policy Implications

The public distribution of foodgrains in India involves short-term policy measures related to domestic production, consumption requirements, and international market conditions. When domestic production is quite unstable, as it has been in many years, it is important to take adequate measures to stabilize availability and to distribute available supplies equitably.

When food is scarce, marginal shortages in supply lead to a relatively large increase in food prices, and low-income consumers often suffer the most. Public distribution of foodgrains in major cities and in some food-

TABLE 16.5 Possible reduction in calorie intake from the abolition of rationing, India

Annual Household Income (rupees)	Calories from Cereals	Percent Decline	Reduction in Calorie Consumption
Kerala			
Less than 600	777	17.7	138
601-1,200	1,008	18.1	182
1,201-2,400	1,569	14.3	224
2,401-3,600	2,004	4.3	86
3,601-4,800	2,216	2.2	49
More than 4,800	2,441	1.9	46
Gujarat			
Less than 2,400	1,749	11.0	192
2,401-3,600	2,103	9.0	192
3,601-4,800	2,448	8.0	196
More than 4,800	2,968	6.0	178

SOURCE: George, 1983.

deficit states introduces a dual-price system. Without a regular mechanism for food distribution in most cities and in chronically deficit states, low-income consumers might have difficulty maintaining the consumption they achieved under rationing.

The effectiveness of the public distribution system depends on both supply and distribution arrangements. On the supply side, domestic procurement is the most important source of food for rations, and when the procurement price is close to the open-market price, farmers may not resist procurement. In states with surpluses such as Punjab and Haryana, where the difference between the open-market price and the procurement price is small, farmers' income loss is negligible. The large size of the country, government control of transport facilities, and the unwillingness of the private sector to make massive investments in marketing infrastructure prevent free trade from operating effectively. On the distribution side, the effectiveness of the system depends on a number of factors, such as the proximity of the fair-price shops, the gap between the open-market price and the ration price, the regularity of supplies, the composition of supplies, the physical distribution arrangements, and social awareness.

In many rural areas, fair-price shops are superfluous in a good crop year because of the easy availability of foodgrains at a reasonable price, and they are ineffective in supplying required quantities in a bad year. Therefore, to make the system effective, it is necessary to formulate appropriate strategies to enable the system to survive in both good and bad years. The viability of retail outlets could be established through a stable minimum volume or through the distribution of other commodities. Whereas in a major deficit area (such as Kerala) retail outlets for foodgrains alone are viable, in many other rural areas it is necessary to link foodgrain distribution with distribution of other essential commodities.

The effectiveness of the public distribution system in meeting the consumption requirements of the poor depends on properly identifying the target groups and on minimizing leakages. In India, targeting based on family income has not been satisfactory. In some areas, however, broad exclusion categories based on factors such as land and income tax payment were initiated. In the absence of appropriate means tests for determining eligibility, the commodity composition and quality of foodgrains distributed through the fair-price shops have served as indirect criteria for targeting.

Public distribution of foodgrains in India has resulted in some redistribution of income. Because small farmers are excused from levy obligations, they may benefit from selling their marketed surplus, if any, at the higher open-market price. The subsidy represents an indirect income transfer from the central government to food-deficit areas. Further, consumers depending on open-market purchases (often quality-conscious

higher income groups) pay a relatively higher price than consumers who purchase foodgrains from fair-price shops.

It is often pointed out that a more lasting solution for eradicating poverty is to provide increased employment and income opportunities for the poor. Although this may be the long-term solution, in the short run a consumer-oriented food subsidy system can be a viable approach for increasing the nutritional status of the poor. Within this framework, effective management of purchases, sales, imports, and stocks can reduce the government subsidy.[7]

7. According to the projections of Krishna and Chibber (1983), if inventory and trade policies are nationalized, the government can ensure rising per capita consumption while reducing the cost of the system to about a third of what it would be if current policies were continued.

17 Pakistan's Ration System: Distribution of Costs and Benefits

BEATRICE LORGE ROGERS

Pakistan's ration system was established in 1942 to deal with shortages of basic goods caused by wartime disruption in supply. At that time, the ration shops handled wheat and sugar, tea, matches, kerosene, yarn, and cotton cloth. After partition, the system was continued to control hoarding and profiteering of scarce goods. All trade in wheat was rationed and controlled by the government until the 1960s when, as a result of several years of favorable weather, supplies became plentiful. Rationing was abolished, but the shops continued to sell *atta* (whole wheat flour), which the government obtained through its guaranteed price support scheme, with no limitation on quantity.

In the mid-sixties, bad weather and the war with India again resulted in scarce supplies. The system of "provisioning" was instituted, whereby a subsidized, rationed amount of wheat was sold through the shops, with more available on the free market at a higher price. That system continued through the 1970s. In recent years, good weather along with various agricultural development schemes, including high guaranteed prices for farmers, has resulted in abundant supplies of wheat, putting Pakistan in the position of a modest exporter. At the same time, ration prices have been allowed to float upward toward the free-market rate, while the rise in free-market prices has moderated because of increasing supplies. Wheat is still subsidized, but the price difference between rationed and open-market wheat flour has fallen from around 35 percent in the mid-seventies to around 7 to 8 percent in Sind and Punjab, and 30 percent in Northwest Frontier Province (Cornelisse and Naqvi, 1984).

Distribution of sugar through the ration shops started during the Korean War, when shortages were caused by a shift from sugar to cotton production. To limit the foreign exchange drain of imports, sugar was rationed, with no legal free market. Production incentives, including high guaranteed prices (currently about 150 to 200 percent of world-market levels), have resulted in surplus domestic sugar production, and as of Au-

gust 1983, the marketing of sugar is no longer subject to government control. Ration shops were used to ensure equitable distribution of vegetable oil at subsidized prices during the severe shortage in 1972 and 1973. Increasing domestic production of this commodity is a high priority of the government.

This history demonstrates the long-standing nature of the ration system and its flexibility to deal with changing conditions of supply. It also demonstrates that the system has not been seen as a mechanism for income redistribution or nutritional improvement (although it has served both those purposes) but as a means of ensuring orderly markets for basic goods.

Present Operation

In order to use the ration system, one must be a resident of Pakistan with a fixed address. There are no income-related criteria for eligibility. Users must register with a particular ration shop in their area. Households receive ration cards indicating the number of members in the household by age, since rations are determined on a per person basis. Ration shops are privately owned, subject to licensing and regulation by the provincial government, and the owner makes a commission on each sale as well as being allowed to keep and sell the bags in which the ration commodities are delivered. It is government policy that there be one ration shop for each 3,000 to 6,000 population. In fact, there are far more than this number: average availability ranges from one shop for 1,326 people in urban Northwest Frontier Province (NWFP) to one for 1 878 people in rural Sind (Pakistan, 1978). In 1982, the number of registered households per shop ranged from 434 in Sind to 546 in NWFP (Cornelisse and Naqvi, 1984). Ration shop licenses are politically valuable, and so it is in the interest of provincial governments to distribute them widely. And since shop profits are based on volume, it is in the interest of each shop owner to ensure that supplies are regularly and conveniently available.[1]

In 1977, ration users in urban areas were entitled to receive 7.5 kilos of *atta* per person per month (half for children under twelve years old) and between 700 and 1,400 grams of sugar (variable by province). Wheat was available in only those rural areas not self-sufficient in wheat production. This was to avoid producers selling their wheat to the government and then buying it back at the lower price, but it meant that subsidized wheat was not available even to households that did not raise wheat. The sugar quota

1. Certain abuses of the system are also profitable, such as inflating the number of registered recipients in order to have more supplies to sell (Rogers, 1978; Cornelisse and Naqvi, 1984). Such abuses make the system more costly to the government but do not prevent distribution to consumers.

in rural areas was smaller (235 to 470 grams per person per month), but universally available. By 1982, the wheat ration had been reduced to 5.2 kilos per month per adult (Cornelisse and Naqvi, 1984).

Accessibility and Use

The ration system is remarkable for its widespread accessibility. In urban areas, 95 percent of the population has access to a shop within a half-hour's distance on foot, and more than 99 percent could reach a shop within an hour.[2] In rural areas, coverage is more uneven but still much higher than that of other government services. Except in Baluchistan, which contains 4 percent of the nation's population in the geographically largest area, 75 to 80 percent of households can reach a shop within an hour, and in NWFP and Sind, 95 percent or more of the population can reach a ration shop—even if it takes more than two hours. In rural Punjab, 19 percent of households have no access to a shop, possibly because local wheat and sugar production makes it unnecessary.

Distance is a barrier to use of the shop; nonetheless, 40 percent of rural households located more than two hours from a shop use it. There are some areas in which no shop is available, including much of rural Baluchistan and some of the remote parts of Sind and NWFP. However, coverage by the ration system is far superior to coverage by the health system, for example, where by the most optimistic estimate there is one facility of *any* kind for every 10,000 population, and these are quite unevenly distributed throughout the country (Siraj, 1983). Fifty-six percent of urban households and over 40 percent of rural households report that they have access to a government health facility (Rogers, 1978). Of those with access to a government facility, only 17 percent make use of it. Barriers to use include cultural patterns that prevent women from going out of the house, as well as distance and the fact that the facilities are often closed.

In contrast, the rate of use of ration shops is impressive. Nationwide, almost 90 percent of households with a shop available in 1976/77 used it for sugar. In urban areas, the rate was 95 percent, and in rural areas it varied from 51 percent in Sind (where respondents reported frequent shortfalls in supply) to 88 percent in NWFP. Use of the shops for wheat was somewhat lower, ranging from 72 percent in urban Sind and Punjab to 94 percent in urban NWFP and Baluchistan. In rural areas, use rates were more variable because wheat was not universally available.

The point of this discussion is that the ration system is widely available, widely known about, and widely used by the population. Further,

2. All data, unless otherwise noted, are from the *Micronutrient Survey* (Pakistan, 1978).

commodity supplies were reliable at the time of the survey (1976/77). In urban areas, more than 90 percent of households reported that their shop never ran out of *atta* or sugar. In rural areas, 79 percent of households said that *atta* (where it was sold) was always available, and 69 percent of households reported the same for sugar. Twenty-five percent of rural households said their shop often or always was out of sugar. Presumably, diversion to the black market was a major cause of this, although simple failure of supply is also a possibility. A more recent study (Khan, 1982) found only 1 percent of ration shop users in an urban area reported irregular supply of *atta* to be a problem. Generally speaking, the picture is one of orderly supply of commodities. The reason for this is that the supply of commodities to shops is determined individually by each owner, who can thus accommodate to variations in offtake. It is in the interest of each owner to ensure that supplies are regularly available for sale and to avoid the storage problems of overstocking. With thousands of shops in operation, it would be impossible for decisions about supply to be centrally made while still maintaining smooth operations.

Benefits

The ration system, throughout its history, has supplied limited quantities of price-controlled commodities to all registered households that chose to purchase them. These commodities have in some cases been explicitly subsidized, that is, the government procured them from suppliers at a relatively higher price and sold them to consumers at a lower price, paying the difference out of revenues. This was the case with wheat in the late sixties and seventies and up to the present, and with oil in 1972-74. In other cases, no explicit subsidy has been given, but the government simply procured supplies and issued them to ration shops at a price that covered their costs. This was the case with sugar in the seventies: producers received a guaranteed support price for their sugar, and the issue price to consumers covered this price as well as distribution costs. In the early seventies, procurement prices of sugar were below world-market prices, so there was an implicit consumer subsidy paid by the producers as well as a reduction in price due to rationing of all legally available supplies. In the late seventies, the procurement price for sugar was raised above the international market price, so that consumers effectively subsidized producers through the ration system. Sugar is now in surplus and has been decontrolled and unrationed since August 1983 at domestic prices that exceed international ones.

The benefit of the ration system to consumers is that they can purchase some mix of commodities at below-market prices. This of course represents an increase in real income for those who use the commodities.

There may be nutritional benefits even above those derived from an increase in income for households that, in the absence of the subsidy, would purchase less than the rationed amount. For these households, the low price is an incentive to purchase more of the food than would be the case simply with a neutral income transfer. Because a large proportion of consumers purchase exactly their quota of rationed *atta* and none from other sources (Rogers, 1978; Khan, 1982), it is not possible to state with certainty for how many households the quota is in fact extramarginal. Another important aspect of the ration system is that, in the face of large seasonal variations in prices, it has provided a secure source of supply at a known, low price for at least some proportion of household food. Cornelisse and Naqvi (1984) report that the highest consumption of rationed food occurs in the season of scarcity between October and March April. The floor under household consumption in a marginally nourished population may be of much greater nutritional significance than the average per capita calorie and protein increment due to the program would suggest.

Consideration of nutritional benefits is important in a country in which all the health indicators point to serious and widespread malnutrition. The Micronutrient Survey found 43 percent of children under age five suffering from some degree of growth retardation (of which 17 percent were grades 2 and 3 according to Waterlow, 1973). A World Health Organization (WHO) study in 1982 found 33 percent of children with these grades of growth retardation. In rural Baluchistan and Sind, over 50 percent of children were at these levels (Lambert, 1983). Infant mortality rates estimated at 115/1,000 by WHO in 1982 confirm the high prevalence of malnutrition. The leading causes of child deaths are diarrhea and respiratory infections, which do not commonly cause death in well-nourished populations. This is an indication that the nutrition situation has not improved, in spite of a considerable increase in income due to remittances from emigrant workers, which now exceed exports as a source of foreign exchange. Some geographic regions participate more than others in overseas employment, so that only some segments of the population have benefited.

The Micronutrient Survey, which is the most recent national survey to measure food consumption, nutritional status, and household income for the same sample, found that protein and calorie malnutrition in children (measured by anthropometry) as well as iron deficiency (measured by clinical signs and biochemistry) were inversely related to income. At lower incomes, a higher proportion of households consumed less than the recommended daily allowance (RDA) of calories and protein, adjusted for age and sex. Further, the survey found households at the median income of Rs 600 per month spent over 60 percent of their incomes on food. Households

with incomes of Rs 300 spent 97 percent of their incomes on food, and at Rs 100, they spent more than 100 percent, indicating that they were living on credit. At this income level, more than half of calorie consumption and over 65 percent of protein consumption are derived from wheat, the cheapest source of both protein and calories at the time of the survey. These figures suggest that households with incomes below the median face an absolute income constraint on food consumption. Further, demand for wheat is quite responsive to price in low-income groups. The price elasticity of income share devoted to wheat (from all sources) is −.785 at a household income level of Rs 100 per month and −.624 at Rs 300, compared with only −.159 at Rs 900, a level moderately above the median. Thus food prices are a critical determinant of food consumption among low-income households. These households are marginal or worse in nutritional adequacy and are already consuming, to a large extent, the cheapest available nutrient sources.

Based on data from the Micronutrient Survey, the ration system contributed about 11 percent of household incomes for urban households with incomes below the median and about 4.5 percent for households above the median. Sugar contributed about twice the income contributed by wheat. Rural households gained less than 1 percent of their incomes from the system. The low figures for rural areas are due to the fact that smaller quantities are available there, more households fail to participate, and wheat is not sold in many rural areas. The ration system added about 114 calories to the daily energy consumption per person in urban households below median income levels and 37 calories to households above these levels. The increase in rural calorie consumption was negligible.

The above figures estimate only the income effect of the subsidy and undoubtedly underestimate the effect on the poorest households.[3] In 1977, the ration price of wheat was 35 to 40 percent below the free-market price. Sugar in the ration shops was less than half the price people reported paying for black market sugar. Low-income households even in rural areas are more dependent on the market (as opposed to their own production) for food. In urban areas, low-income households frequently reported consuming only rationed *atta*. Considering that a household with a monthly income of Rs 100 spends more than that on food, of which over 36 percent is spent on wheat and another 12 percent on sugar, it is hard to imagine that a significant price increase for these commodities could fail to have a negative effect on consumption. Recent changes in the system, including a reduction in the wheat ration, a reduction in most areas in the price differ-

3. A full description of the method, including a discussion of its assumptions and possible inaccuracies, may be found in Rogers et al., 1981.

ence, and the elimination of sugar, may well have reduced the consumption benefits of the ration shops, although they still provide a fallback during periods of a seasonal price increase.

Distribution of Benefits

It has already been mentioned that ration shops are relatively more accessible in urban areas and that the quantity of food delivered is greater. Clearly, the system disproportionately benefits the urban population. Nutrient consumption is also significantly lower in urban areas, although children in some rural areas are worse off.

The system also disproportionately benefits the low-income population, because the *atta* that is sold in the ration shops is widely believed to be of low quality and is therefore not preferred by those who can afford to buy flour or whole-grain wheat on the unsubsidized market.[4] The self-targeting effect of the rationed *atta* is indicated by the fact that below-median-income urban households, which represent 42 percent of the population, consume 47 percent of all the rationed *atta* distributed in urban areas, an intensity of consumption of 1.11.[5] In comparison, the intensity of consumption of the preferred *gandam*, or whole-grain wheat, on the part of the poor is 0.95. Sugar, of course, is a luxury item, not an inferior good. The intensity of consumption of refined sugar by the poor is 0.78; for rationed sugar, it is 0.93, considerably more equitable but not disproportionately in favor of this group. The self-targeting effect was not so visible in rural areas, even in those where wheat is sold, because many rural ration shops sell *gandam*, which is not inferior, rather than *atta*.

In recent years, the self-targeting effect appears to have become somewhat more pronounced (Khan, 1982). Based on Khan's data from the city of Rawalpindi, about 55 percent of rationed *atta* went to households below the median income (for his sample) of Rs 1,185 per month. This may be due in part to the smaller price differential between rationed and open-market *atta*, which reduces the incentive to participate. Another reason may be that, as incomes in general rise, consumption shifts from wheat and *atta* to higher quality foods. This is still quite a high leakage, although of course it is not perceived as a leakage by the government, since the program has never been intended to be targeted toward the poor.

4. Up to the mid-seventies, as much as 50 percent of rationed *atta* was made of wheat imported from the United States under Public Law 480. This hard, red, winter wheat is darker in color and higher in gluten than the preferred local variety and makes a "rubbery" chapati, according to consumers.

5. Intensity of consumption is the ratio of a group's share of total consumption of a good to its share in the population. An intensity of consumption of 1 indicates a group is consuming exactly the amount that would be expected under conditions of perfectly equitable distribution.

Costs

The cost of the ration system has varied considerably from year to year both because of fluctuating import prices and availability of concessional wheat and because of changing government policy about the appropriate procurement price to ensure incentives for farmers and an appropriate retail price for consumers. In the peak year of 1973/74, when food supplies were scarce worldwide and prices for staple grains were well above normal levels, food subsidies constituted 19 percent of current federal government expenditures and 6 percent of provincial expenditures. That was the first year for which food price subsidies were calculated as a separate budget item in government accounts. The following year, food subsidies constituted 15 percent of federal and 3 percent of provincial current expenditure. Since that year, federal expenditures on food price subsidies have been declining (except in 1978–80, when they rose sharply), while provincial expenditures have been increasing steadily. Total expenditure on food price subsidies since 1980 has been approximately stable, declining slightly (see table 17.1). In contrast to such consistently costly subsidy systems as those in Sri Lanka and Egypt, Pakistan's subsidy costs have been controllable. One reason is that the subsidized commodities are rationed, another is that the consumer price has been programed to rise with inflation. While not insignificant, the costs have been manageable.

A less visible cost of the ration program has been the effect of controlled prices on the agricultural sector. As was mentioned earlier, the ration system for sugar entailed implicit subsidies from producers to consumers in some periods and from consumers to producers in others. The ration system for wheat has historically involved an explicit subsidy. The guaranteed procurement price was intended to act as a production incentive to farmers, while the subsidy permitted a lower price to consumers. However, it is only in the last four or five years that the procurement price of wheat has approached the level of the world-market price. Prior to that time, the system had been depressing producer prices for wheat, although subsidies on farm inputs have partially offset this effect. Current government policy is to eliminate input subsidies, while procurement prices for wheat are still slightly below the world market (Cornelisse and Naqvi, 1984). A 1982 survey estimated that government interventions in wheat production and marketing resulted in a transfer of Rs 1,750 million from wheat producers to consumers, while producers received Rs 350 million in transfers from general government revenues (Cornelisse and Naqvi, 1984). These figures do not disaggregate by region, income level, or farm size.

The effect of raising producer prices has been evident in considerable increases in production. With procurement prices well above the international market, sugar is now in surplus. In 1982, free-market prices dropped *below* the government-controlled price level. Wheat has also been

TABLE 17.1 Government expenditures on food subsidies, Pakistan (million rupees)

Item	1972–73[a]	1973–74	1974–75	1976–76	1976–77
Wheat	920	1,917	2,119	1,543	1,107
Federal	920	1,695	1,964	1,180	635
Provincial		222	155	363	472
Edible oil[b]		269	443		
Sugar					4
Federal					4
Provincial					
Total food subsidy	920	2,186	2,562	1,543	1,111
Total food subsidy in real terms[d]	759	1,339	1,228	666	437
Total food subsidy as percent of total government expenditures		10.3	8.3	4.2	2.9

SOURCE: Pakistan, 1978.

[a]Fiscal year is July 1 to June 30.
[b]Estimated.

in modest surplus for the past few years. The government is building stocks and has become a minor exporter of wheat. Production increases in wheat are directly attributable to the extension of high-yielding varieties and improvements in irrigation and fertilizer use, all of which were made possible by the relatively high guaranteed price. However, credit must also be given to a run of good weather and timely rains. It is risky to assume that domestic supply problems in the major grains have been permanently solved, although the emphasis on incentives for farmers will continue to be beneficial.

The Changing Situation

In the Sixth Five-year Plan (1983–88), the government has committed itself to the elimination of subsidies on both consumer prices and agricultural inputs. It remains to be seen whether it is possible to make good on this promise. In 1981, the government announced that it would dismantle the ration system if wheat production reached 12 million metric tons, and a World Bank mission about the same time suggested that the ration system be eliminated then because the current price difference was so small that public resistance would be slight. Now in 1985, the ration system persists although the size of the ration and the degree of subsidy have been reduced and expenditure on consumer subsidies is a declining proportion of total government expenditure.

1977/78	1978/79	1979/80	1980/81	1981/82	1982/83[b]	1983/84 Budget
1,634	2,513	2,353	1,050	1,303	1,121	1,452
966	1,955	1,380	101	190	141	291
668	558	973	949	1,113	980	1,161
	557	884	583	1		
21	11	20	83		38	37
			11			
21	11	20	72		38	37
1,655	3,101	3,257	1,716	1,304	1,159	1,489
611	1,074	1,045	484	323	280	
3.7	5.7	5.1	2.4	1.6	1.2	1.3

[a]Federal only.
[b]Deflated by the food price index (1969/70 = 100).

Nutrition is an explicit priority in the Sixth Plan, yet nowhere is the role of food prices as a determinant of nutritional status acknowledged. Among the nutrition-related objectives of the plan is the integration of nutrition concerns in the agricultural sector, but this is discussed exclusively in terms of increasing domestic supplies of pulses, edible oil, and grains other than rice and wheat. The principal mechanism for accomplishing this is high support prices. There is no discussion of prices as a determinant of consumption. In the draft consumption and nutrition plan of the government published in 1980, it is suggested that distribution of supplemental foods through the health care system (which is to be expanded during the Sixth Plan period) can take care of the nutrition problem. Given the lack of facilities and the very low rate of use of those that are available, it is unrealistic to rely on the health system for this purpose. Further, distribution of supplemental foods in this manner has a poor track record in Pakistan. At the time of the Micronutrient Survey, two provinces were supposed to have regular distribution of weaning foods in all health centers. Respondents in only three households (out of about 1,100) had ever heard of these foods. Visits to numerous health centers revealed no supplies of such foods. This demonstrates the relative ineffectiveness of a top-down distribution system compared with a decentralized ration system fueled by the profit motive.

There is no question that the effort to integrate Pakistan's agricultural system with the world market has been successful and that the na-

tion's economic development depends heavily upon its agricultural development. Farm prices that reflect true social costs are important in promoting those aspects of agriculture in which Pakistan has a comparative advantage. A legitimate concern for the nutrition needs of the poor population should not be abandoned, however.

It might be possible to restructure the system of consumer subsidies without abandoning it completely. Targeting needs to be improved, and the commodity mix might be expanded to include low-prestige pulses such as *gram*. Administrative targeting would be costly to implement and might eliminate many of the needy along with the nonneedy, but as economic conditions improve, the self-targeting nature of *atta* may increase. The degree of self-targeting of this and other commodities could be predicted from up-to-date consumer expenditure data.

The ration system has achieved a remarkably high degree of coverage of Pakistan's population. It is a resource that should not be lightly abandoned. In the past, the government has found the system useful in dealing with sudden shortages of various foods. Such situations might arise again. This is not the first time in Pakistan's history that a few good years have led planners to assume that self-sufficiency in grain production has been achieved for good; that hope has been disappointed before.

Even without being pessimistic about Pakistan's long-term agricultural prospects, one may assume that poverty-related nutrition problems have not disappeared as food supplies have increased. As discussed above, indicators have shown no improvement in child nutritional status in the past ten years. It is a fundamental dilemma of development policy that food prices affect producers and consumers in opposite ways. Without denying the importance of high, or rather fair, producer prices, it is important to consider consumption effects in the short- and medium-term as well.

The ration system, though far from perfect, nonetheless has a number of attributes that recommend its preservation. These include its widespread accessibility, its relatively low administrative burden on the government, its flexibility, and the long-standing experience of those who operate it. Serious thought should be given to improving its benefits rather than eliminating them.

18 Food Subsidy Changes in Sri Lanka: The Short-Run Effect on the Poor

NEVILLE EDIRISINGHE

When a basic needs approach began to be emphasized in development economics, Sri Lanka gained much prominence due to its long-standing involvement in broad social welfare policies.[1] Long before the advent of the basic needs approach, Sri Lanka had pursued a policy of allocating large amounts of resources to enhancing the health, education, and nutrition of the population. On the other hand, it was not too long after the virtues of meeting basic needs started to be appreciated globally that Sri Lanka made a sharp turn from welfare through sharing of poverty to welfare through growth. The change that began in 1977 has led to abandonment of the major element in welfare policy that aimed at broad nutritional welfare through food subsidies. Operationally, the change has resulted in the elimination of all rationing and price subsidies on food and the introduction of an income transfer program through issuance of food stamps intended to protect the really needy. Implicit in the curtailed welfare policies is the expectation that newly adopted growth-oriented investment policies will generate incomes for all, including the present poor. This chapter will examine some implications of this change on fiscal costs, income distribution, and the nutritional welfare of low-income households.

Historical Setting

For nearly four decades, Sri Lanka had a comprehensive food subsidy scheme where eligibility was almost universal. This scheme, in general, included a major subsidy on rice, the staple food of the entire population; other major commodities subsidized at some time or another were wheat flour, sugar, and powdered milk. Over the years, the quantum of the subsidies and the consumer entitlements have undergone changes influenced

1. See Isenman, 1980; "Participatory Development and Dependence," 1979.

by fiscal and political considerations. A few salient features in the history of the food subsidy program are as follows:

1. Notwithstanding some sharp differences in political ideologies, since the country's independence successive national governments have ensured the continuance of food subsidies to achieve the dual objectives of political stability and social equity.
2. The success of the subsidy program was closely linked to the balance-of-payments status due to the country's dependence on imports for over 50 percent of the food supplies during most of the period.
3. A remarkably high degree of active political participation by the population, particularly the organized sector of the labor force, provided sufficient pressure to ensure continuation of the subsidies.
4. The provision of certain input subsidies to rice farmers and the operation of a state-sponsored guaranteed price scheme were intended to minimize the deleterious effects of consumer subsidies on producers.

Although begun as a wartime necessity to ensure equitable distribution of limited supplies and protection of consumers from postwar inflationary pressures, the scheme continued beyond the war situation. For nearly two decades, the program provided around four pounds of rice per capita, per week, to the entire population at highly subsidized prices. In the mid-1960s, there was a halving of the quantities issued under ration, but the universal subsidy was unchanged. It was only during the late 1970s that any substantial attempts at targeting food subsidies were seen.

The political sensitivity of the subsidy program was clearly exhibited during food related riots in the early 1950s. Within a few years of the food subsidy scheme's operation, fiscal strains were clearly visible due to the postwar inflationary prices of rice. The government's overenthusiastic adherence to a proposal by the International Monetary Fund led to drastic reductions in the subsidy component—related not only to food but also to certain other commodities and services. This first attempt to bring administered prices closer to costs was met with widespread protests, spearheaded by organized urban labor. The food riots led to partial abandonment of the subsidy reforms, the resignation of a prime minister, and, shortly after, a change of government. The new political regime did restore the original benefits. The lower world prices of rice during the second half of the 1950s considerably assisted these changes.

During the early 1960s, acute fiscal and balance-of-payments problems led to a proposal by the finance minister to curtail the subsidy. This was squelched by the backbenchers, and the minister resigned. In the second half of the 1960s, continued balance-of-payments difficulties and a worldwide rice shortage brought about a strategic compromise between economic logic and political feasibility: the rice ration was reduced by half

but given free of charge. Food subsidies were a key issue in the general election of 1970, however, and political power did change hands. Some increases in subsidized ration entitlements were made, which were aided by the decline in world prices of rice in the early 1970s. Some adjustments to prices and entitlements were achieved in response to worldwide food shortages during 1972–73, and income taxpayers were removed from the scheme. The latter had only a negligible effect on the subsidy bill, however, and most drastic changes in the scheme were undertaken by the government that came into power in 1977. In February 1978, the rice ration was limited to about 50 percent of the population; in September 1979, quantity rationing was replaced by an income transfer in the form of food stamps; during 1980, all remaining price subsidies on food were eliminated.

Changes in the Subsidy Program

Given the high political sensitivity of the food subsidies, the drastic changes of the subsidy program effected during 1978 and 1979 were remarkable. The overall change has been hailed as an "achievement which no government in a quarter century before managed," and also that "it had contained the burden of the food subsidy without disastrous political consequences and without obvious or pervasive ill effects on welfare" (Nelson, 1983). The immediate causes and mechanics of the change and the degree to which welfare, at least nutritional welfare, has been affected will be discussed in the following sections.

Two of the main objectives of the government elected (with a massive mandate) in 1977 were a liberalized trading system and substantial domestic savings. That these objectives should have a direct effect on the food subsidy and rationing program should not be surprising.[2] By early 1978, the new policies had resulted in a substantial devaluation of the currency, which in turn resulted in a massive increase in the total food subsidy. Effects of the devaluation thus provided the immediate reason for curtailing the food subsidy.

The drastic reductions in the food subsidy burden, strategically phased over two years to minimize adverse reactions, were implemented in three major steps. The first step was to conduct a means test in January 1978 in order to restrict the number of recipients. Specifically, subsidized rice was restricted to families whose monthly incomes were less than Rs 300 per month. Marginal adjustments were allowed for large families with higher incomes. There was no change in the quantity entitlement of the free ration of one pound of rice per person per week or the three pounds of rice that could be purchased at a subsidized price. The means test was

2. Almost every study that praised Sri Lanka's achievements in social welfare through state intervention also commented on the high cost of achieving them.

conducted on self-reported incomes of the households. This procedure, as well as the difficulties in checking on incomes, may have been conducive to underreporting. This partially explains why there were no explicit protests to this change. Other reasons for lack of protests were the popularity of the newly elected government and the maintenance of the subsidies on rationed rice and nonrationed foods such as wheat flour and sugar. The first phase of the change resulted in the restriction of rice rationing to 7.6 million persons, or nearly 50 percent of the population.

The second phase involved the change from ration shops to food stamps in September 1979. After much publicity, households were required to apply for food stamps through a declaration of incomes and household composition. All members of households receiving a monthly income of less than Rs 300 were eligible for food stamps.[3] Children under eight years of age received stamps to the value of Rs 25; children between eight and twelve years received Rs 20; others received Rs 15 per month. Special stamps to the value of Rs 9.5 per household were issued to purchase kerosene. If necessary, these stamps could be used to purchase food. The bundle of commodities that could be purchased using food stamps included rice, paddy (unhusked rice), wheat flour, bread, sugar, powdered milk, and certain locally produced pulses. Although substantial reductions in coverage were expected when changing to the food stamp scheme, the number of recipients remained virtually the same as in the curtailed ration scheme. In fact, the number of recipients increased with each issue of the food stamps (every three months). This led to a freeze on new issues, beginning in March 1980. The most striking characteristic of the new food stamp scheme was the allocation of a fixed nominal amount of approximately Rs 1.8 billion in the annual budget for the cost of food and kerosene stamps.

The third phase marked the elimination of price subsidies on food. Under the rationing scheme, as well as during the first phase of food stamps, price subsidies remained on rice, flour, sugar, and infant milk foods. These subsidies amounted to Rs 2,326 million in 1979. In 1980, prices of rice, flour, and sugar were raised to reflect the costs, and the total price subsidy was reduced to Rs 305 million. By the end of 1982, these subsidies were almost totally eliminated. Prices of most of the major foods more than doubled between 1979 and 1982—a reflection of the effect of general inflationary pressures and the removal of subsidies. The administered prices of wheat flour and sugar increased 170 percent and 133 percent, respectively, between early 1979 and the third quarter of 1982 (Sri Lanka, 1983). The percentage increase in bread price is equivalent to the increase in the wheat flour price.

3. Adjustments for higher incomes and family size have been allowed for.

Fiscal Costs

The food stamp scheme in its final form—with a constant allocation of Rs 1.8 billion and food priced so as to incur no losses—has been most successful in reducing the fiscal burden of the food-related welfare policies. This is clearly evidenced in some of the government accounts shown in table 18.1.

In earlier years, some foods imported by the government had been sold at a profit, thus leading to a reduction in the overall food subsidy. This practice is particularly evidenced in the case of profits from the sale of sugar, which during the 1960s brought about substantial reductions in the net food subsidy. The reduction or elimination of these profits in later years, the increased costs of imports, and the increased population receiving subsidy benefits resulted in food subsidies accounting for a substantial share of government expenditures. In the mid-1970s, they accounted for approximately 15 percent of total government expenditures and about 5 percent of the gross national product. By 1982, total food subsidies inclusive of the food and kerosene stamps had fallen to 5 percent of the total government expenditures and 2 percent of the gross national product.

Apart from the savings to the government, the new scheme provides a clear advantage for budgetary planning purposes. Under the earlier price subsidy scheme, final commitments on the food subsidy were not known until the profit-loss accounts of the sale of all imports (and domestically purchased commodities) were finalized. The new scheme, on the other hand, provides a clear picture of the financial commitments prior to actual expenditures.

What has been the effect on the budgetary savings? If the magnitude of the food subsidy alone is considered, substantial savings are indicated. Compared with the total food subsidy of Rs 2,893 million in 1979, the allocation for food stamps has resulted in a savings of around Rs 1,000 million. What is perhaps more important is the net savings for all expenditures linked with the new scheme. As the food stamp scheme was introduced to support the incomes of the poorer households, steps were also taken to protect wage earners (most of whom are not eligible to receive food stamps) from the effect of eliminating subsidies. Accordingly, wage increases to employees of government institutions and public corporations have been effected. The cost to the government in the form of a higher wage bill for its own employees and lower export duties to permit state corporations to grant wage increases to their workers has been estimated at around Rs 700 million in 1980. If this amount is to be treated as a direct outcome of the policy of shifting to food stamps with limited beneficiaries, then the net budgetary savings drop to a mere Rs 300 million.

TABLE 18.1 Fiscal costs of subsidy and transfer programs, Sri Lanka (million rupees)

Year	Rice	Flour	Sugar	Other Foods	Net Subsidies	Food Stamps
1966/67	445.3	-22.1	-224.8	3.6	202.0	
1967/68	548.9	-24.0	239.5	10.9	296.3	
1968/69	582.0	-11.2	-254.6	12.6	328.8	
1969/70	532.4	3.6	221.1	12.5	327.4	
1970/71[a]	586.2	10.4	64.0	1.9	534.5	
1971/72	526.5	22.6	47.1	33.2	525.2	
1972/73	564.0	111.0	21.8	24.0	677.2	
1974	745.1	148.1	26.5	30.8	950.5	
1975	785.5	218.0	215.0	11.9	1,230.4	
1976	679.3	52.0	165.1	41.2	937.6	
1977	943.0	363.6	70.0	47.5	1,424.1	
1978	1,066.1	1,027.9		68.7	2,162.7	
1979	1,215.6	894.1	138.6	77.7	2,326.0	508.0
1980	72.0	272.0	-144.0	105.0	305.0	1,614.0
1981	75.0	105.0	48.0	82.0	310.0	1,321.0
1982				100.0	100.0	1,475.0

SOURCES: Central Bank of Ceylon; World Bank.

[a]Four-fifths of expenditures during the fiscal year of fifteen months: October 1, 1971 to December 31, 1972.

These are, of course, the immediate fiscal effects. Larger savings will accrue in the long run, arising from the nonindexed nature of the income transfer through food stamps.

Distributional Effects

About half of all households are beneficiaries of the food stamp scheme. Households receiving free rations at the time of the change from rations to stamps was also about half the total number.[4] Eligibility criteria in both schemes were based on a minimum income level of Rs 300 per family. Under both schemes, around 58 percent of rural households received government transfers. In the change from quantity rations to food stamps, the incidence of recipients in the urban and estate sectors, which

4. Comparative analyses of the food stamp scheme and the food rationing scheme are based on Central Bank of Ceylon (1981, 1984). Most of the first survey was conducted when quantity rationing was in operation. The food stamp scheme was in operation when the latter survey was conducted.

Kerosene Stamps	Total Subsidies and Stamps Values		Total as a Percent of Government Expenditures	Total as a Percent of GNP (Market Prices)
	Nominal	Real (1952 = 100)		
	202.0	175.9	8	2
	296.3	243.8	10	3
	328.8	251.9	10	3
	327.4	236.9	9	3
	534.5	376.6	14	5
	525.2	384.2	10	4
	677.2	409.6	13	4
	950.5	511.5	16	5
	1,230.4	620.5	17	6
	937.6	467.2	11	4
	1,424.1	700.8	16	5
	2,162.7	949.4	12	5
59.3	2,893.3	1,146.6	14	6
163.0	2,082.0	654.3	7	3
164.0	1,995.0	531.4	7	3
171.0	1,746.0	419.6	5	2

were 40 percent and 21 percent, respectively, before the change, dropped to 32 percent and 13 percent after the change.[5]

The relatively higher percentage of beneficiaries in the rural sector can be attributed to the fact that rural incomes, which are mostly agriculture related and seasonal, are not easily accountable. The low average income levels in the rural sector may also have contributed to this higher incidence. In the urban sector, average incomes are relatively higher, more regular, and more accountable—particularly in the organized sector. Estate-sector incomes are largely concentrated among organized labor working in the plantations. Their wage payments are highly identifiable and are usually received by more than one member in a household.[6]

5. Distribution of the population among different sectors during this period shows about 75 percent in the rural sector, 18 percent in the urban sector, and 7 percent in the estate sector. The estate sector consists of all households in tea and rubber plantations of over twenty acres and with more than ten resident workers.

6. The average number of income earners per household in the urban, rural, and estate sector is 1.64, 1.45, and 2.46, respectively (Central Bank of Ceylon, 1981, 1984).

Although around half of all households receive food stamps, this group is by no means coterminous with the poorer half of the population. In fact, according to survey data, about 30 percent of the households in the lower half of the population appear not to have received these income transfers, while a similar percentage of households in the upper half of the expenditure range do receive food stamps.

Shares of total government outlay on food stamps in 1981/82 and the net food subsidy in 1978/79 received by expenditure classes and sectors are shown in table 18.2. The poorest 40 percent received only 50 percent of the food subsidy in 1978/79. Due to leakages in the rationing scheme as well as untargeted price subsidies on wheat and milk products, income classes above the fortieth percentile captured half of food-related subsidies. After the change to food stamps, the share captured by the bottom 40 percent increased from 50 to 60 percent.

Table 18.3 indicates that the relative contribution of government transfers to total expenditures of poorer households declined after the change in the program. The nominal value of the food stamps, though substantially higher than the nominal value of the food rations received in 1978/79, remained constant throughout, while nominal prices and expenditures increased over time. As an income redistribution measure, the effect of both schemes on the poor has been significant. But the nonindexed nature of food stamp payments will continue to erode their real value.

Nutritional Welfare

Some of the major factors expected to minimize the adverse effects of the removal of food subsidies on nutrition are (1) higher agricultural incomes due to free-market pricing; (2) new and expanded income-earning opportunities due to liberalization of trade and removal of controls; (3) new employment opportunities arising from agricultural development, construction, and other forms of investments; (4) wage increases to government and semigovernment employees; (5) higher wages in the private sector; and (6) income transfers through the food stamp scheme. The overall effect of these factors on real consumption vis-à-vis nutritional welfare of low-income households is examined in the following sections.

Price subsidies on certain food and nonfood items and free issue of rice rations were prevalent during 1978/79. During 1981/82, there were no food price subsidies, and some nonfood subsidies, such as on public transport, have also been either drastically reduced or eliminated. Direct assistance to the poor was through food stamps.

The average food share in the household budget increased from 66 percent in 1978/79 to 68 percent in 1981/82. This change is statistically

TABLE 18.2 Distribution of food subsidy and stamp transfers among income groups, Sri Lanka (percent)

Per Capita Expenditure Quintile	Food Stamps Transfers, 1981/82				Food Subsidy Transfers, 1978/79			
	All-Island	Urban	Rural	Estate	All-Island	Urban	Rural	Estate
1 (poorest)	35	2.7	31.6	0.40	26	4.8	19.6	1.0
2	25	2.5	22.7	0.20	24	4.1	17.3	2.9
3	18	2.3	15.5	0.07	20	3.0	12.9	4.2
4	12	2.0	9.8	0.15	17	3.9	10.0	2.8
5	10	2.9	4.9	0.10	13	4.1	6.1	2.0
Total	100	13.0	85.0	1.00	100	20.0	66.0	13.0

SOURCE: Data from Central Bank of Ceylon.

TABLE 18.3 Relative contribution of government transfers to total household expenditures, Sri Lanka (percent)

Per Capita Expenditure Quintile	Food Stamps, 1981/82	Food Subsidy, 1978/79
1	14.0	16.1
2	8.5	10.0
3	6.5	7.9
4	5.5	5.5
5	4.5	2.1

SOURCE: Data from Central Bank of Ceylon.

significant and, according to Engel's law, implies worsening of the real incomes. Higher food shares during the latter period are also indicated for all income groups, except the poorest decile.

A plausible explanation concerning the poor's inability to increase their relative budget shares to food is that the poor have certain fixed commitments intrinsic to survival and to future income generation. Expenditures on clothing, housing, lighting, and transportation form some of these basic costs. While food is also a basic good, food itself may not be forthcoming if these nonfood costs, such as for transportation to work, are not incurred. When real incomes decline, maintenance of these fixed commitments may occur at the expense of food intake.

If higher food shares allow maintenance of adequate nutritional intake, then the losses in welfare may only be nonfood related. That this has been so on the average is indicated by the almost identical levels of mean per capita calorie consumption during the two periods. In fact, the mean calorie consumption levels of 2,283 and 2,271 per day in 1978/79 and 1981/82, respectively, exceed the recommended allowance of 2,200 calories for the average Sri Lankan (Sri Lanka, 1972).

Of greater relevance than mean calorie intake is the distribution of calorie intake relative to income. The effect of the policy change on the nutritional welfare of low-income households during the short period under consideration appears to be clearly negative. While calorie inadequacy vis-à-vis recommended allowance has continued to be a problem of the bottom five deciles, the nutritional position of the poorest two deciles had deteriorated significantly by 1981/82. The decline registered is around 122 calories per day, or 8 percent from their already low levels of calorie intake of about 1,500 calories per person per day. In contrast, the middle- and upper-income classes have either sustained or improved their calorie intake (Edirisinghe, 1987).

Nutritional poverty at the level of the individual household can be assessed using Lipton's (1983) definition of ultrapoor households as those failing to achieve 80 percent of recommended calorie allowance although they allocate over 80 percent of their total incomes to acquire food. The incidence of ultrapoor households among all households has increased from 4.6 percent in 1978/79 to 6 percent in 1981/82. The proportion of ultrapoor households in the poorest quintile increased from 19.5 percent in 1978/79 to 25 percent in 1981/82 (Edirisinghe, 1987).

The new policy package envisaged substantial growth in the agricultural sector, particularly the domestic sector where paddy is the mainstay. In fact, agricultural performance during the new policy regime has been noteworthy. Between the 1976–78 average and the 1980–82 average, agricultural gross domestic product has had an annual growth rate of 4.4 percent, with paddy production recording a rate of 7.9 percent per year (Thorbecke and Svejnar, 1984). Comparative rates of growth during the previous seven years have been 1.9 percent for agricultural gross domestic product (GDP) and 1.4 percent for paddy production. Removal of constraints on transportation and input supplies, increased demand for domestic agricultural products (particularly due to removal of price subsidies on imported wheat flour), favorable weather, and larger agricultural investments may all have contributed to expansion in agricultural production. The overall growth in the economy has also been remarkable; the GDP grew 8.2 percent in 1978, 6.3 percent in 1979, 5.8 percent in 1980, and 5.8 percent in 1981, with the contribution of the agricultural sector outstanding (World Bank, 1982).

How were the poorer households in the agricultural sector affected by the expansion in economic activity in that sector? If the effect is to be viewed through the incidence of ultrapoverty, table 18.4 indicates that agricultural workers, in both the domestic and export sectors, were made worse-off. Their poverty rates increased significantly by 1981/82 relative to 1978/79. Plantation workers appear to have lost the most.

TABLE 18.4 Incidence of the ultrapoor in agriculture, Sri Lanka (percent)

Agricultural Population	Among Poorest 20 Percent		Among All Households	
	1978/79	1981/82	1978/79	1981/82
General farmers	15.8	17.8	3.0	3.2
Plantation workers	14.0	23.8	3.2	6.3
Agricultural workers (mainly paddy)	23.8	36.7	10.8	15.4

TABLE 18.5 Contribution of income transfers through food stamps and food subsidies to total calories, by expenditure class, Sri Lanka

Item	Per Capita Expenditure Quintile									
	1		2		3		4		5	
	1981/82	1978/79	1981/82	1978/79	1981/82	1978/79	1981/82	1978/79	1981/82	1978/79
Per capita expenditure (nominal Rs/month)	131	78	199	116	262	151	351	201	702	441
Food share (percent)	75	75	73	72	71	68	67	64	53	50
Calorie consumption per capita per day	1,368	1,490	1,894	1,914	2,264	2,255	2,678	2,612	3,154	3,152
Expenditure elasticity for calories[a]	.83	.70	.67	.60	.56	.52	.49	.43	.17	.21
Marginal calories per day[a]	8.6	13.3	6.3	9.7	4.9	7.7	3.4	5.6	0.8	1.5
Calorie addition from food stamps or food price subsidies	151	168	110	122	89	92	64	61	22	14
Calories from food stamps or food price subsidies (percent of total)	11	11	6	6	4	4	2	2	0.6	0.4
Price paid for 100 calories (nominal Rs)	0.24	0.13	0.26	0.14	0.28	0.15	0.30	0.16	0.35	0.19

SOURCE: Data from Central Bank of Ceylon.

[a]Expenditure elasticities and marginal calories were derived from the following estimates of calorie consumption functions for 1978/79 and 1981/82:

$$(1978/79)\ C = \underset{(13)}{1.572315} + \underset{(44)}{1.924613}\ (Y) - \underset{(35)}{0.140343}\ (Y^2), \qquad (R^2 = 0.56.)$$

$$(1981/82)\ C = \underset{(9)}{-1.45388} + \underset{(54)}{2.729213}\ (Y) - \underset{(45)}{0.1946917}\ (Y^2), \qquad (R^2 = 0.65.)$$

where C is the natural log of per capita daily calories and Y is the natural log of per capita total expenditure. t-ratios are given in parentheses.

The nutritional situation of the low-income households discussed above appears to be consistent with the observed greater inequality in the distribution of incomes in 1981/82 compared with 1978/79. The Gini coefficient, based on the monthly income of income receivers, increased from 0.49 in 1978/79 to 0.52 in 1981/82 (Central Bank of Ceylon, 1984). Income flows to the bottom deciles have not been able to sufficiently mitigate the adverse effects of price increases.

Government Transfers and Nutrition

Table 18.5 gives estimates of basic consumption relations observed during 1978/79 and 1981/82. What strikes one is the fact that expenditure elasticities have increased substantially among low-income households. Reductions in real incomes of the poorest 40 percent may have affected calorie consumption much more seriously in 1981/82 than in 1978/79. Similarly, marginal calories (the increment to calorie consumption if monthly per capita expenditures are increased by one rupee) declined from 13.3 calories to 8.6 calories between the two periods. These estimates of marginal calories may be used to evaluate the net increment to total calories brought about by government income transfers. One assumes here that households treat government transfers as just another source of monetary income. For the poorest quintile, additional incomes from food stamps brought about a net addition of 151 calories in 1981/82. Food rations and food price subsidies in 1978/79 may have added 168 calories to total calories of the bottom quintile. Although the share of calories from government incomes in total calories is similar in both periods, the absolute level of calorie consumption in 1981/82 by the poorest households had undergone a sharp decline.

That the food stamps have not been able to effectively mitigate the deleterious effects of inflation is clearly indicated when one compares the amount of additional calories that the same nominal value of food stamps may have bought in 1978/79 and 1981/82. Rs 17.55—the mean value of food stamps received by the poorest 20 percent—would have resulted in 234 additional calories or 16 percent of total calories in 1978/79, compared with 151 calories or 11 percent of total calories in 1981/82.

For a comparison of real consumption changes based on calorie consumption, consider the expenditures required in 1981/82 to consume the same number of calories as in 1978/79. Based on the estimated consumption function, the expenditure required by the bottom quintile to consume 1978/79 calorie level (1,490 calories) in 1981/82 was Rs 145.18, which is 86 percent higher than the 1978/79 expenditure level of Rs 78.99. The cost-of-living index related to nutritional welfare of the poorest quintile, therefore, is 1.86. This indicates that the real value of the food stamps had almost halved by 1981/82.

Conclusion

From the point of view of economic growth, Sri Lanka's new economic policies have met with considerable success. It is not expected, though, that the benefits of growth can remove nutritional risk from lower income deciles in the short run. Income transfers through food stamps were intended to cushion the low-income segments from the adverse effects of a new price structure. Since income transfers have not been indexed, their real values have deteriorated over time. For households that have not experienced higher wages, new employment, or larger agricultural and other incomes to compensate for their losses in real incomes due to price increases, nutritional repercussions appear to have been serious. Evidence is strong that government intervention is required to improve the nutritional welfare of households that have not yet been able to participate in the country's economic growth.

19 Effects of Brazilian Wheat Subsidies on Income Distribution and Trade

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Brazilian wheat policy as considered in this chapter consists of two relatively separate components: production policies and consumption policies. Both components derive from a number of national goals, including self-sufficiency in wheat supply, control of inflation, provision of cheap food for the urban population, and improvement in the distribution of income. The central government has maintained both a monopolistic and a monopsonistic role in the wheat market in order to implement its policy. The government is the sole importer and sole buyer from farmers and the only seller to the mills. Moreover, the government has maintained rigid control over prices at the producer, wholesale, and retail levels.

This chapter is divided into four parts.[1] The first two parts are a brief description of the production and consumption policies for wheat. The third part is a discussion of the effects of the production and consumption subsidies on international trade. The fourth part is a discussion of the effects of those policies on welfare and income distribution.

Wheat Production Policy

Wheat was introduced in Brazil in the first quarter of the sixteenth century. However, there is no indication in the history of Brazilian agriculture that the crop had ever developed enough to satisfy domestic demand (Bethlen, 1962). With no guaranteed market, farmers had, prior to the mid-1930s, little incentive to increase production beyond the amount needed to satisfy their own needs, with small surpluses to be marketed. In the mid-1930s, the government established a chain of experiment stations to generate production technologies suitable to Brazilian conditions. However, because of the high cost of production, poor soils, serious disease

1. This chapter is a summary of the major findings of a more thorough study of Brazilian wheat policy by Calegar (1984).

problems, difficult climatic conditions, and inadequate scientific and technical support, cultivated area and production were relatively small until 1967. After 1967, cultivated area and production increased at a faster rate, reaching a record in area in 1979 (4.1 million hectares) and in production in 1976 (3.0 million metric tons), but production has been unstable, mainly due to climatic conditions and diseases, both of which have made wheat production in Brazil a relatively risky activity.

Guaranteed producer prices have been used to stimulate domestic production ever since 1938. In recent years, the producer price has been set by the National Supply Council and made public by the National Supply Superintendency by means of announcements, known as *portarias*. Purchase of domestic production is made by the Bank of Brazil, according to rules designed to avoid frauds such as have occurred in the past. These frauds gave rise to concepts such as "paper wheat" and "wheat nationalization" and are well described in P. T. Knight (1971) and Pereira Soares (1980). Since 1962 these frauds have occurred with less frequency, in large part because of a change in the manner in which the producer subsidy was paid.

Self-sufficiency in wheat production has been a national goal, pursued primarily by means of a producer price policy that guarantees prices above world-market prices at the prevailing exchange rate. In addition, substantial resources have been provided for the development of marketing facilities (including cooperatives that supply inputs), for the purchase of the output (through the Bank of Brazil), and for distributing the production to mills throughout the country.

The main arguments for self-sufficiency are to save foreign exchange and to avoid possible economic pressure from Brazil's major suppliers of wheat. However, according to P. T. Knight (1971), "no valid economic arguments exist for increasing wheat production further until research and extension have drastically altered the efficiency with which resources can be employed in this activity." Few previous studies have attempted to evaluate the real and nominal effects of wheat production subsidies over time (Contador, 1974; Pereira Soares, 1980; and P. T. Knight, 1971).

Wheat Consumption Policy

The consumption side of Brazilian wheat policy has a more recent history, even though wheat, in the form of French bread, macaroni, and wheat flour, has been a staple food in the consumer's basket since colonial days. Only since an explicit systematic consumption subsidy was instituted in 1973 has the per capita consumption of wheat tended to increase. This subsidy has been a major factor impeding the attainment of self-sufficiency in production because it contributed importantly to keeping down

the ratio of domestic production to consumption. As a result, imports have supplied approximately 70 percent of domestic consumption over the seventeen-year period 1966–82.

Wheat is the major food imported into Brazil. Both consumption and imports have increased over time, with a peak reached for both items in 1980. The value of wheat imports as a share of the value of total imports fell from 1967 to 1971. Since 1971, the quantity of wheat imported has increased from 1.7 to 4.1 million tons, with a relatively constant share of total imports around 3.5 percent.

The main reason given for providing an explicit consumption subsidy in the period after 1972 was to reduce domestic price inflation and, in particular, to escape the effects of the increases in the world price of wheat in the mid-1970s (Carvalho, 1981). Concern has also been expressed about maintaining the nutritional status of low-income groups. The subsidy was instituted in the expectation that the world price of wheat would soon return to the low level that prevailed before the increase. However, the real price of wheat (deflated to the 1967 price level) did not return to the stable U.S. $60–70 per metric ton of the late 1960s and early 1970s. Instead, it rose to U.S. $148 in 1974, went down to U.S. $61 in 1977, rose to U.S. $71 in 1978, and rose again to U.S. $90 in 1980. It was U.S. $81 in 1981.

The effect of consumption subsidies on inflation is not as straightforward as proponents of such subsidies appear to believe. In the short run, subsidies can lower the cost of living of particular groups in society. Moreover, wheat products have a heavy weight in the calculation of the general price index. Hence, on the surface, wheat subsidies might appear to reduce inflation. However, as in Egypt (chapter 13), the government costs of such subsidies may contribute to the budget deficit and, consequently, may be a cause of inflation.

Ferreira e Silva (1981) estimated that a reduction of the consumption subsidy by 25, 50, and 100 percent as of November 1980 would increase the general price index by 0.57, 1.14, and 2.27 percent, respectively. If one considers that during 1980 the inflation rate in Brazil was 110 percent, then it would appear to make little difference, except in a distributional sense, to have an inflation rate 2.27 percent higher by cutting the entire consumption subsidy. Since it can be seen that the effect on the measured rate of inflation of eliminating the subsidy would not be great, and that it would be a one-time effect, then the question remains, Why doesn't the government eliminate it? The answer lies in the other major reason for maintaining the consumption subsidy, which is that the subsidy is supposed to keep the price of wheat products down to benefit low-income groups who are heavily dependent on those products.

Only a few studies have been made on this issue (Ferreira e Silva, 1981; Carvalho, 1981; and Williamson-Gray, 1982). At least two issues of

interest have been raised about the consumption subsidy for wheat. First, the subsidy has in fact benefited mostly medium- and high-income groups, because those groups consume more wheat products than do low-income groups. Moreover, on a regional basis, the poorer northeast, north, and center-west regions have benefited less from the subsidies than the more developed south and southeast regions. The former regions have lower per capita consumption of wheat than do the southern regions, even though per capita consumption has increased substantially in the poorer regions since 1972.

Despite the bias of the wheat subsidy in favor of medium- and high-income groups, low-income families spend a larger share of their budget on wheat products (5–6 percent) than do medium- and high-income families (about 1 percent). Thus a price increase for these products would have a larger relative effect on low-income families. This would occur in a situation in which about 72 percent of the economically active population receives only 25 percent of all income (Carvalho, 1981).

A second issue is that the consumption subsidy has distorted the relative prices between wheat products and rice, beans, corn flour, and cassava flour, making wheat products relatively cheaper and stimulating their consumption. As a consequence, the producers of rice, beans, corn, and cassava, who are usually low-income small farmers, are losing.

No previous studies of these two important issues have attempted to estimate the government's social and foreign exchange costs or the social benefits of the consumption subsidy for wheat and their relative incidence among income groups. Just one study has attempted to evaluate the alternative products to which the wheat subsidy could be changed in order to diminish the spillover effect (Williamson-Gray, 1982). That study did not address the issues listed above.

The government has been urged to phase out these subsidies, especially in light of their drain on the budget. Given the economic, social, and political considerations, however, it has been difficult to do this. In 1980 the government initiated a plan to remove the consumption subsidy gradually, but at the present time it is still high.

Effects of Subsidies on Production, Consumption, and Trade

If one takes the border price as the opportunity cost of wheat, the production and consumption subsidies as a percentage of that price can be calculated (table 19.1). Both subsidies are calculated with the official exchange rate (OER) and the shadow exchange rate (SER) for each year in order to show the implicit, explicit, and total protection of producers and consumers as separate groups. The implicit protection (tax) is given by the difference between the SER and OER columns, and it can be seen that

TABLE 19.1 Estimated subsidies on wheat production and consumption with the official and shadow price foreign exchange rates, Brazil (percent)

	Production Subsidy		Consumption Subsidy	
Year	Official Exchange Rate (OER)	Shadow Exchange Rate (SER)	Official Exchange Rate (OER)	Shadow Exchange Rate (SER)
1965	55.0	9.0	0.8	17.5
1966	45.5	21.4	0.6	14.5
1967	45.8	21.7	3.9	19.8
1968	49.7	24.6	−0.8	16.1
1969	49.4	24.4	3.6	19.8
1970	59.3	32.7	−16.6	2.9
1971	40.0	16.7	−3.0	14.2
1972	26.4	5.2	4.6	20.6
1973	−8.2	−23.6	36.5	47.1
1974	−12.4	−27.0	58.1	65.0
1975	5.8	−11.8	53.7	61.4
1976	8.2	−9.8	60.9	67.4
1977	83.5	29.9	35.3	54.2
1978	51.1	26.0	50.8	58.9
1979	0.5	−16.3	70.5	75.4
1980	−21.7	−30.2	83.2	85.1
1981	13.6	−10.5	57.3	66.3
1982	32.7	7.4	41.8	52.9

SOURCE: Calegar, 1984.

NOTE: The production subsidy is the nominal rate of protection for producers, and the consumption subsidy is the nominal rate of protection for consumers.

producers have been implicitly taxed and consumers subsidized because of the overvaluation of the cruzeiro. The explicit and the total protection of each group are given by the OER and SER columns, respectively. When the production subsidy is calculated with the official exchange rate, producers were taxed during three years—1973, 1974, and 1980—and in two of these years the border prices were at peaks. But when the overvaluation of the cruzeiro is taken into account, producers were implicitly taxed during seven years and received a lower subsidy in all other years. This was so because an overvalued currency serves as an implicit tax on products that compete with imports and causes domestic prices to be lower than they would be in the absence of the overvaluation.

On the consumption side, up until 1972 the consumption subsidy was mainly implicit, due to the overvaluation of the cruzeiro (table 19.1, last column). After 1972, as the result of an upturn in the world price of wheat and the end of purchases under the concessionary terms of Public Law 480

(Banco do Brasil, 1979), the government subsidized wheat consumption explicitly every year up through 1982 (table 19.1, third column). It should be noted that consumers were explicitly taxed during three years of the period 1965–82 as a consequence of policies followed by the government during the 1960s and the early 1970s (Hall, 1980). That policy consisted of buying wheat according to the concessionary terms of Public Law 480 (below world prices and with long-term financing) and selling it in the domestic market at higher prices in order to obtain revenue to finance the wheat subsidy for producers.

The main real effects of the Brazilian wheat policy are on quantities produced, consumed, and imported. The percentage changes in those quantities due to price distortions are indicators of the relative effects of the wheat production and consumption subsidies. In table 19.2, estimates of these changes are given, utilizing the official and the shadow price for-

TABLE 19.2 Estimated changes in production, consumption, and imports if the free-trade world price had prevailed, Brazil (percent)

	Production in Year t − 1[a]		Consumption in Year t		Partial Imports in Year t[b]		Total Imports in Year t[c]	
Year (t)	OER	SER	OER	SER	OER	SER	OER	SER
1966	39	7	0	5	−2	0	−2	5
1967	32	16	1	6	−3	−1	−2	4
1968	33	16	0	5	−3	−1	−3	4
1969	35	18	1	6	−6	−3	−5	4
1970	35	18	4	1	−11	−6	−16	−5
1971	42	24	−1	4	−21	−16	−22	−9
1972	29	12	1	6	−20	−11	−18	1
1973	19	4	12	17	−5	−2	11	21
1974	−8	−18	24	30	7	39	60	130
1975	−9	−21	21	27	32	209	110	463
1976	4	−9	26	32	−2	9	17	70
1977	6	−7	12	22	−2	30	14	102
1978	58	22	19	25	−18	6	26	26
1979	36	19	36	42	−57	19	192	60
1980	0	−13	56	61	2	20	58	163
1981	−17	−24	24	31	6	43	17	114
1982	10	−8	15	21	−4	10	47	47

SOURCE: Calegar, 1984.

NOTE: OER is the official exchange rate and SER is the shadow exchange rate.

[a]Year t − 1 is considered, because the production of this year is consumed in year t.

[b]The partial changes in imports in year t are the result of the production subsidy in year t − 1, after it is discounted for the change in demand for seeds in year t as the result of the wheat production in year t.

[c]The total change in imports includes the effects of both producer and consumer subsidies.

eign exchange rate. The positive changes in production were at most 24 percent; and during seven of the eighteen years, production was negatively affected. The guaranteed producer prices for wheat worked in part as a compensation for the implicit taxation arising from the overvaluation of the currency (comparing the OER column with the SER column in table 19.2).

Estimates of the partial changes in imports indicate that only from 1967 to 1973 and during 1978/79 were the production subsidies capable of reducing imports. However, the reductions were relatively small, which implies that in order to reach self-sufficiency in wheat a much higher production subsidy would be required, with high costs to the treasury. On the other hand, if one considers the official exchange rate, the production policy appears to be more effective, even though to reach self-sufficiency, a large increase in the subsidies would still have been required.

The relative changes in consumption were small until 1972. Thereafter, they increased faster, reaching a peak in 1980, when the increase in consumption was 61 percent higher than it would have been if free trade had prevailed. The same calculations with the official exchange rate show lower values for the relative changes in consumption, because in this case consumers appear to have a smaller subsidy, and consequently the increases in consumption were smaller.

Finally, the total effects on imports showed a net increase in imports for fifteen of the eighteen years analyzed. This resulted from the explicit consumption subsidy after 1972, the production tax in years of high world prices (1973–76 and 1978–81), and the overvaluation of the currency.[2]

As can be seen, the estimated effect of the production subsidy was not very large, but the consumption subsidy had a big effect on imports. Thus it would be of interest to know the costs of the subsidies during the period considered (1966–82) and the welfare and distribution effects associated with them.

Effects of Subsidies on Welfare and Income Distribution

Estimated average effects of the production and consumption subsidies under the OER and the SER during the period 1973–82 are presented in table 19.3. Whereas estimates with the SER represent the actual effects from society's standpoint, estimates with the OER give an idea of the average explicit cost to the treasury, the change in the welfare of consumers and producers, and the social costs to the country.

As can be seen, producers were in fact taxed during the period; the effect on foreign exchange was negative, meaning that the production pol-

2. Note that production subsidy in year $t - 1$ affects a partial change in imports and total imports in year t.

TABLE 19.3 Estimated average effects of the production and consumption subsidies under the official and shadow foreign exchange rates, Brazil

Average Annual Subsidy 1973-1982	Subsidy Cost (Cr$1,000)	Share of Subsidy Cost (percent)		Effect on Foreign Exchange EF (Cr$1,000)	Social Cost as a Result of EF (Cr$)[a]
		Change in Welfare	Social Cost (SC)		
Production					
Shadow exchange rate	−866	−119	10	−602	0.28
Official exchange rate	538	83	17	115	0.80
Percent of treasury expenditure[b]	0.02	0.170	0.030		
Gross domestic product[c]	0.02	0.017	0.003		
Consumption					
Shadow exchange rate	11,458	84	16	−4,212	0.44
Official exchange rate	8,262	86	14	−2,930	0.39
Percent of treasury expenditure[b]	3.50	3.10	0.40		
Gross domestic product[c]	0.36	0.31	0.05		
Total					
Shadow exchange rate	10,592	81	19	−4,814	0.42
Official exchange rate	8,800	86	14	−2,815	0.56
Percent of treasury expenditure[b]	3.80	3.30	0.50		
Gross domestic product[c]	0.38	0.33	0.05		

SOURCE: Calegar, 1984. Treasury expenditures and gross domestic product are from Banco Central do Brasil.

[a]This represents in centavos the cost per cruzeiro of additional imports.

[b]Percent of the simple average of the estimated treasury expenditure 1973-82 (Cr$232,806 million at 1977 averages).

[c]Percent of the simple average of the GDP 1973-82 (Cr$2,297,071 million at 1977 averages).

icy stimulated wheat imports instead of promoting import substitution; and each Cr$1 of additional imports cost Cr$0.28 extra in social cost due to inefficiencies in production (table 19.3). Consumers, on the other hand, were heavily subsidized, capturing on average 84 percent of the total subsidy benefits, the remainder being lost in inefficiencies in consumption. The effect on foreign exchange was highly negative, and the social cost per Cr$1 of imports was about Cr$0.44. During the period as a whole, both policies combined had a cost of Cr$10.6 billion, with 81 percent captured by consumers and 19 percent lost in social costs due to inefficiencies in both production and consumption. Imports increased almost Cr$5 billion at a unit social cost of Cr$0.42 per Cr$1 of expenditure.

In summary, Brazilian wheat policy contributed to an increase in wheat imports—and at a high social cost per cruzeiro of wheat imports. Moreover, more profitable activities in the economy almost certainly suffered from the huge costs of the wheat policy: resources were directed to support the subsidy at the expense of other activities, and at the same time the public deficit was enlarged. Estimates with the official exchange rate give an idea of the size of the explicit cost to the treasury of each policy and the two combined. As a percentage of treasury expenditure (3.5 percent) and as a percentage of gross domestic product (0.36 percent), the more expensive subsidy was that given to consumers.

As one considers all these effects on producers, on consumers, and on society as a whole, it would also be useful to investigate the effects on income redistribution and to determine if there would have been a less expensive policy alternative for reaching the same policy objectives. In an attempt to answer these questions, the distribution effect of the consumption subsidy on consumers of the metropolitan area of Belo Horizonte was estimated for 1974.[3] This was done by using data from a FIBGE (Fundacao Instituto Brasileiro de Geografia e Estatistica) survey and performing a simulation by transferring the subsidy cost from wheat to rice for the given population.[4] The curves presented in figure 19.1 summarize the basic analysis. Curve A shows the distribution of consumers' welfare when the subsidy is given to rice; curve B is the perfect equality curve; curve C is the same as curve A when the subsidy is given to wheat; and curve D shows current distribution of total expenditures.

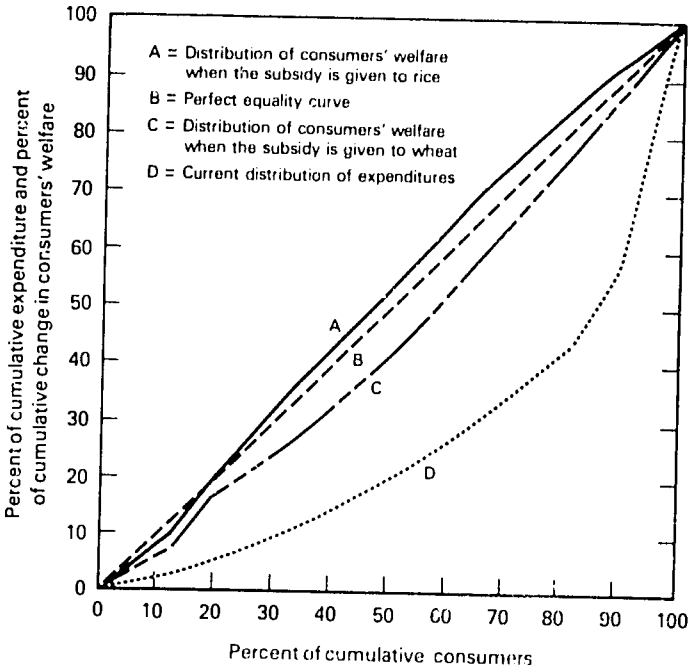
Some conclusions can be drawn from figure 19.1. First, because curve A is above curve B, distribution of the benefits of a rice consumption subsidy is biased to low-income people. The reverse is true for curve C except for the first income class. However, because curve C is above curve D, a wheat consumption subsidy—although biased toward high-income people—is less biased than current expenditure distribution and would thus reduce inequity. The main problem with the subsidies for either wheat or rice is a problem of low-cost effectiveness, because the spillover effect is large.

A final question of interest is to identify which consumption subsidy is better from a nutritional standpoint. An attempt is made to determine the relative daily per capita gain in calories from a subsidy on wheat and on rice, both of which are rich calorie sources. In both cases, the increase in calorie consumption is relatively small (less than 1.5 percent of the per

3. See Williamson-Gray (1982) for an analysis of the nutritional implications of shifting the subsidy from wheat to rice, cassava, or milk.

4. We used special runs of "Estudo Nacional da Despesa Familiar: Consumption in Calories by Global Income Classes." Annex A: Number of Days Researched; Annex B: Average Number of Commensal Days. Rio de Janeiro, FIBGE.

FIGURE 19.1 Distribution effect of consumption subsidy, Brazil



capita calorie consumption), and this is because the values of the price elasticities of demand for both products are low. Hence the subsidies act more as an income transfer than as an instrument to stimulate food consumption directly. Moreover, the spillover effect (nontarget groups capturing the income transfer) is large. This is because the nontarget group consumes the largest amount of total wheat or rice consumed. Consequently, a general price subsidy for either rice or wheat is very costly if the primary goal is either to redistribute income or to improve the nutritional status of the poor. This problem is more severe in the case of wheat, because the present wheat consumption policy provides the subsidy to wheat grain that millers buy from the government. Pereira Soares (1980) estimates that during the period 1967–77, millers captured approximately one-third of the value of the subsidy through manipulations in production of special wheat flour and in marketing the bran, which the government did not have strong control over.

A general price subsidy for rice, although it has shown better distributional characteristics (see figure 19.1), would be difficult to administer because of lack of organizational structure (Carvalho, 1981). The question of which kind of program the government should undertake for distributing income or ensuring the nutritional status of the poor remains.

20 Fiscal Cost and Welfare Effects of the Maize Subsidy in Mexico

NORA LUSTIG

The Mexican government has been involved in regulating the prices of staples since the 1930s.[1] Formally, the dual objectives of this long-standing intervention have been to protect the rural *campesinos* (peasants) against speculators and drastic decreases in agricultural prices and to protect poor urban consumers against rising prices in food products.

The government uses three methods to pursue these goals. First, it purchases basic grains at guaranteed (support) prices and subsidizes agricultural inputs. Second, it maintains price controls on staples and subsidizes industries that produce them. And, third, it participates directly in the production and marketing of basic foodstuffs.

Currently, the most important subsidy scheme is the one on maize. It is important for three reasons. First, maize is the major crop of peasants. Second, maize and its various processed forms constitute the major source of calories for the poor. Finally, the maize subsidy receives the largest portion of the government's resources dedicated to food.

Recently, policymakers concerned with reducing the government deficit have criticized the program because it places a fiscal burden on the government and because it is untargeted. An attempt is made here to estimate the fiscal cost and the welfare effects of the program by drawing on empirical information. In particular, the welfare effects on the rural poor

1. For a historical description of government price intervention for agricultural crops, see Barkin and Esteva, 1981.

The chapter benefited from discussions with several colleagues; in particular, I want to express my gratitude to Amit Bhaduri, Alain de Janvry, Albert Fishlow, Carlos Jarque, Cassio Luiselli, Antonio Martin del Campo, Jacobo Schatan, and Lance Taylor. Useful suggestions were also made by Pascual Garcia-Alba, Francisco Giner delos Rios, Darryl McLeod, and Tom Reardon. Needless to say, the responsibility for errors and mistakes remains solely mine. I want to thank Silvia Ponce de Leon and Javier Rodriguez for their contribution in the laborious computation work.

are analyzed, using two indicators: the effect on purchasing power (measured by the size of the budget share and maize-based income for the target population) and the effect on equity (measured by the share in total consumption and in total production of the target population).

The Maize Subsidy and Its Fiscal Cost

The maize subsidy works as follows. The government purchases maize at a given price (the guaranteed price in the domestic market and the international price when it imports) and sells it to the mills at a lower price. In addition, the government absorbs all the distribution and storage costs. In the final stage, the processed goods (maize tortillas, flour, and dough) are sold to the public at a price set by the government. The government agency in charge of carrying out the subsidy, CONASUPO (Comision Nacional de Subsistencias Populares), is the sole importer and exporter of corn (Lustig and Martin del Campo, 1983).[2]

The dual objective pursued by the government—providing subsidies to both producers and consumers—has resulted in an increasing operational deficit for CONASUPO. Between 1965 and 1982, CONASUPO had the highest deficit among government agencies. On the average, CONASUPO absorbs more than 30 percent of the total transfers from the central government to state organizations. However large CONASUPO's deficit has been, it has not exceeded 1.4 percent of gross domestic product in any year (including capital outlays) and has on the average stayed below 0.5 percent. Moreover, CONASUPO's total deficit has generally been less than 10 percent of the total government deficit.[3] These numbers are important because they indicate that eliminating food subsidies in Mexico will not solve the fiscal problems faced by the government.

Table 20.1 shows that maize has received the highest share of subsidies. Maize's share declined drastically in the early 1970s, while subsidies on sorghum and oilseeds rose substantially. Since 1973, however, maize's share has been approximately 45 percent.

The total fiscal cost of the program is made up of three components: the difference between the guaranteed price and the subsidized price, the difference between quantities bought and sold, and the "pure" transaction costs, such as transportation, storage, distribution, and management.

2. Similar schemes are in operation for other major food products, such as wheat bread, crackers and noodles, beans, rice, cooking oil, sugar, poultry and eggs, and pork. See Lustig and Martin del Campo, 1983, for a description of the mechanisms in each case. Many other food (and nonfood) products are subject to price controls but are not subsidized, among them coffee, canned tuna, canned fruits and vegetables, and ham.

3. These estimates as well as those that follow do not include the costs of subsidizing agricultural inputs, because these programs are carried out by other agencies.

TABLE 20.1 Distribution of subsidies among crops, Mexico (percent)

Year	Maize	Wheat	Beans	Rice	Sorghum	Oilseeds
1971	70.6	16.0	3.4	[a]	0.6	9.4
1972	85.9	8.1	2.0	0.2	2.5	1.3
1973	41.4	25.3	0.2	1.2	0.5	31.4
1974	42.2	38.6	5.7	2.9	6.7	3.9
1975	44.5	12.7	24.2	1.8	10.6	6.2
1976	44.7	18.5	5.0	4.5	8.0	19.3
1977	45.9	11.3	2.6	1.5	16.8	21.9
1978	41.6	17.7	6.6	2.6	13.5	18.0
1979	50.5	21.0	[a]	[a]	21.2	7.3

SOURCE: Mexico, Office of Advisers to the President, 1981, internal document.
[a]There was a surplus.

Contrary to what might be expected, the major contribution to the cost of the maize subsidy has not always been the net transfer component of the cost (that is, the difference between the value of purchases and sales). During the period 1971–79, this component was generally well below 50 percent of the total.[4] If, in turn, the net transfer component is divided into price differentials and changes in inventories, the major contributing element to the net transfer cost of the subsidy was the difference between the average purchase and sale prices.

Who Benefits?

Because maize-based products and beans are the basic staple foods of the Mexican diet and also the major source of calories for the poor in both rural and urban areas, maize is also the crop that 70 percent of the poor peasants grow (CEPAL, 1982).[5] Depending on the area, maize is consumed in different forms. In rural areas, both purchased and home-produced maize is transformed into tortillas within the household. In urban areas, tortillas are usually bought from the "corner store," the *tortilleria*. Under the current subsidy scheme, unprocessed maize is not subsidized, whereas maize tortillas are sold at a government-set price, reflecting subsidies allocated to mills that produce the tortillas.

4. This trend, however, may have changed somewhat between 1980 and 1982, given the fact that the price differential has increasingly widened.

5. Unprocessed maize is the food item constituting the largest budget share for the first three population deciles and holds second place for the fourth decile; tortilla (processed corn) is second in the budget for the fourth and sixth deciles, and is fourth for the population as a whole (Lustig, 1983).

Given (1) the major role played by maize, both as a source of income and a source of calories for the poor; (2) the rural-urban difference in the manner in which maize is consumed; and (3) the characteristics and cost of the current subsidy scheme, the analysis of the welfare implications of the program is particularly relevant. Two questions are addressed here. Is the current scheme able to reach the most needy groups? Is this done without a large share of scarce fiscal resources going to subsidize those who do not need it?[6] In 1977, the poorest households (those with income below the prevailing minimum wage) were either small peasants or agricultural workers in the rural areas; self-employed; or workers in the informal subsectors of commerce, manufacturing, and services in the urban areas (Lustig, 1983). These groups constitute the target population.

In order to capture variations in the effects of the maize subsidy scheme on the target population, which arise from differences in the composition of income by source and the patterns of expenditure, the target group is classified according to various criteria, including activity, occupational position, and income. Among agricultural producers, maize producers are distinguished from the rest. This classification procedure yields eight categories in the target group and eight in the nontarget group (table 20.2).

Effect on Purchasing Power

Table 20.3 shows the dualistic pattern in the consumption of maize by target (and nontarget) populations: consumption of unprocessed maize declines and consumption of tortilla rises with the degree of urbanization. In column seven, it can be seen how the subsidy on tortillas plays an important role in protecting the purchasing power of the metropolitan poor (classes 12 and 13) and less so that of the urban poor (classes 8 and 9) and agricultural workers (class 7). Low-income peasants (classes 1, 2, and 5), however, are unaffected by the subsidy on tortillas because they seldom purchase tortillas but, rather, make them at home. Home-produced tortillas (from home-grown or purchased maize) generally require a smaller cash outlay. In some areas, however, homemade tortillas are not a choice but a necessity, because there are no industrial mills in the area.

Production of tortillas by the household implies a low imputed wage to the persons that make them. It has been estimated that, in general, this imputed wage is below 5 percent of the minimum urban wage. The imputed wage declines as the spread between the price of maize and the price of tortillas narrows. However, as long as the wage is higher than that which could be obtained from alternative sources, it would be expected that tortillas from the store will not replace homemade tortillas, especially for those

6. Two welfare aspects not examined here are the effect of the subsidy scheme on the rate of profit for the millers and the effect on inflation of the limit on the price of tortillas.

TABLE 20.2 Target and nontarget populations, Mexico, 1977

Agriculture	Agricultural Producers	Maize	Total income ≤ minimum wage	Maize-based income < expenditure on maize	1*	Maize producers but net buyers
				Maize-based income ≥ expenditure on maize	2*	Low-income maize producers
			Total income > minimum wage	Maize-based income ≤ minimum wage	3	High-income maize producers
				Maize-based income > minimum wage	4	Maize producers of surplus
		Other Crops		Crop-based income ≤ minimum wage	5*	Other crop producers at or below subsistence
				Crop-based income > minimum wage	6	Other crop producers of surplus
	Agricultural Workers				7*	Agricultural workers
Nonagriculture	Urban		Total income ≤ minimum wage	Workers	8*	Marginal urban workers
				Other	9*	Marginal urban other
			Total income ≤ two minimum wages		10	Medium-income urban workers
			Total income > two minimum wages		11	High-income urban workers
	Metropolitan		Total income ≤ minimum wage	Workers	12*	Marginal metropolitan workers
				Other	13*	Marginal metropolitan other
			Total income ≤ two minimum wages		14	Medium-income metropolitan workers
			Total income > two minimum wages		15	High-income metropolitan workers
Unemployed					16	Unemployed

NOTE: The minimum wage in 1977 was about P2,700 per month (approximately U.S. $120).

*Target population.

TABLE 20.3 Average incomes, patterns of expenditure, and consumption shares, by socioeconomic class, Mexico, 1977

Socioeconomic Class[a]	Monthly Income (pesos)	Monthly Autoconsumption[b] (pesos)	Percent of Households
Rural	2,172	207	25.0
Agricultural workers (7)	2,122	110	12.9
At or below subsistence (1, 2, 5)	1,562	262	10.2
Surplus (3, 4, 6)	5,790	575	1.9
Urban	4,968	43	35.5
Marginal workers (8)	1,771	36	6.8
Marginal other (9)	1,396	81	4.5
Medium-income workers (10)	3,790	29	12.8
High-income workers (11)	9,597	51	11.4
Metropolitan[d]	7,369	13	27.8
Marginal workers (12)	2,370	14	3.1
Marginal other (13)	2,073	13	1.5
Medium-income workers (14)	4,424	8	11.3
High-income workers (15)	12,193	19	11.8
Unemployed (16)	4,488	48	11.7
Average	4,882	77	

SOURCE: Mexico, 1977.

[a]Numbers in parentheses refer to categories in table 20.2.
[b]Consumption of own production.

TABLE 20.4 Average incomes, patterns of expenditure, and consumption shares of the maize and nonmaize agricultural producers, Mexico, 1977

Socioeconomic Class[a]	Income (pesos)	Monthly Autoconsumption (pesos)	Percent of Households
Maize producers (average)	2,031	330	9.7
At or below subsistence	1,446	275	8.3
Net buyers (1)	967	182	1.2
Low-income (2)	1,080	265	6.0
High income (3)	4,006	433	1.1
Surplus (4)	5,531	667	1.4
Other crop producers (average)	3,015	231	2.4
At or below subsistence (5)	2,077	207	1.9
Surplus (6)	6,507	325	0.5

SOURCE: Data from Mexico, 1977.

[a]Numbers in parentheses refer to categories in table 20.2.
[b]Does not include autoconsumption.

Percent of Total Expenditure				Percent of Total Consumption	
Food[c]	Autoconsumption	Maize	Tortillas	Maize	Tortillas
48.0	7.7	7.2	1.5	57.7	9.4
55.0	4.4	8.3	2.2	31.6	6.7
49.4	11.8	8.1	0.7	22.1	1.6
27.9	8.6	2.7	0.9	1.0	1.1
43.7	0.8	1.3	2.1	30.9	39.6
58.5	1.7	5.8	3.6	10.2	5.0
56.1	4.2	6.8	2.7	7.2	2.2
51.6	0.6	1.3	3.2	8.5	17.3
37.3	0.5	0.4	1.3	5.0	15.1
36.4	0.2	0.1	1.9	2.4	40.2
52.1	0.5	0.6	5.3	0.6	4.4
52.7	0.5	0.7	5.3	0.1	2.1
45.0	0.2	0.1	3.2	0.8	17.6
32.0	0.1	0.05	1.1	0.9	16.1
41.1	0.9	1.3	1.9	9.0	11.8
42.5	1.4	1.5	1.9		

[c]Does not include autoconsumption.
[d]Those who live in either Mexico City, Monterrey, or Guadalajara.

Percent of Total Expenditure				Percent of Total Consumption	
Food[b]	Autoconsumption	Maize	Tortillas	Maize	Tortillas
46.0	12.1	6.8	0.6	21.5	1.5
49.0	13.2	8.9	0.5	17.9	0.9
64.0	10.1	30.1	0.3	8.1	0.1
48.9	15.4	5.1	0.4	7.2	0.4
42.8	9.8	4.4	0.8	2.6	0.4
38.7	10.1	3.3	0.7	3.6	0.6
46.1	6.3	4.4	1.3	4.5	1.1
49.9	7.4	6.6	1.3	4.1	0.7
40.3	4.7	0.9	1.3	0.4	0.4

people who have little cash income.[7] When ready-made tortillas are not available, home production continues even at a negative imputed wage (that is, the cash outlay for maize would exceed the controlled price of an equivalent amount of tortillas).

Thus it is important to estimate the effect on purchasing power of a change in the price of maize from, for example, a rise in the guaranteed price (keeping in mind that maize as a consumption item is not subject to price control). By looking at the budget shares for unprocessed maize (column six, table 20.3), it can be seen that an increase in the price of maize (induced by CONASUPO's intervention, for example) especially hurts the real income of the rural poor in classes 1, 2, 5, and 7 and the urban nonmetropolitan poor in classes 8 and 9. An increase in the price of maize, however, also implies a rise in income for the poor producers (class 2). In fact, as table 20.4 shows, they are important net beneficiaries of such an increase. In this table, net purchasing power is measured by the differences between the maize-based income share and the budget share of maize. A rise in the price of maize has contradictory implications for welfare, because maize is an important source of income but also a major consumption item of the poor, and the present subsidy scheme does not benefit direct consumers of maize. In the absence of other measures, keeping the price of maize low would have a positive effect on poor net consumers, but it would hurt poor net producers; the opposite would occur when the price of maize is increased. Thus a change in the price of corn in one direction would improve the living standard of one subset of the very poor at the expense of another subset.

To be fair to all target groups, the government would have to compensate the losers by taxing the nontarget population. The criteria used in the decision as to whether the price should be kept high or low, however, must not be only the fiscal cost of the compensation.[8] Another important target involved in an active guaranteed price policy for maize is to expand production and productivity and thus to reduce dependency on imports of this basic crop and to reduce unit costs of production. In addition, the expansion in production can generate more employment, and thus the compensation process may partially take place without government outlays.

Effect on Equity

Using an index that reflects the distribution of the benefits of a general price subsidy, it was found that the only two food products that would

7. This is true in zones where there are no employment opportunities or where the woman cannot leave the home because her activities in the household cannot be replaced. The estimates for the imputed wage can be found in Lustig and Martin del Campo, 1983.

8. In the sample used, the fiscal cost of the compensation is estimated to be almost the same for net consumers as for net producers (considering the target population only).

TABLE 20.5 Proportion of income derived from maize and average budget shares of maize for maize producers, by class, Mexico, 1977

Category[a]	Monthly Income (pesos)	Households	Percent of Households in Total	Percent of Maize-Based Income in Total	Percent of Expenditure on Maize in Total	Income Minus Expenditures (pesos)
Target						
Maize producers but net buyers (1)	967	141	12.9	22	30.0	−8.0
Low-income maize producers (2)	1,080	675	61.6	67	5.8	61.2
Nontarget						
High-income maize producers (3)	4,006	123	11.2	16	4.4	11.6
Maize producers of surplus (4)	5,531	157	14.3	88	3.3	84.7

SOURCE: Data from Mexico, 1977.

NOTE: It is assumed that the share in total expenditure is the same as in total income, and that the sale price equals the purchase price.

[a]See table 20.2.

distribute fiscal outlays progressively were unprocessed corn and *piloncillo*, a sugar molasses that is consumed in rural areas (Lustig, 1983). Maize tortillas occupy the tenth place if food products are ranked according to their progressiveness in the distribution of the benefits of a nontargeted consumption subsidy, which means that there are nine food products that would yield a more progressive distribution than tortillas.[9]

What is the equity effect of the guaranteed price policy for maize under the assumption that it does improve the price for the producer?[10] According to a study based on the 1970 agricultural census, compared to other products, maize is the most "peasant-intensive" crop (Rodriguez, 1983). This means that the resources devoted to guaranteeing prices are distributed more progressively in the case of maize than in the case of other crops, such as wheat and oilseeds. The problem with maize, however, is that it is also consumed largely by low-income groups.

Results indicate that for the target population as a whole the net equity effect of a rise in the price of maize is negative. Low-income peasants (class 2), however, benefit because they are net sellers of maize (see table 20.5).[11]

Conclusions and Policy Implications

If the objective is to make the maize subsidy program more progressive and cost effective, two logical approaches seem to arise from the previous discussion. The first is to target the tortilla subsidy on the poor. But removal of the general subsidy on tortillas is an extremely political issue. For various reasons, this subsidy has a fundamental symbolic value to the Mexican population and is perceived as an indicator of the direction of government policies.

9. This is true even under ideal conditions, where everybody has access to subsidized tortillas. Distortions introduced by inefficiency or corruption may make the subsidy more inequitable still.

10. One aspect that has not been addressed here is whether the government-guaranteed price policy on maize constitutes a subsidy to producers. However, in comparing the guaranteed price, the average rural price, and the world price of corn in table 20.1, first, it seems that government intervention has been effective on the average in getting the market price close to the guaranteed price. Second, for most of the years there seems to have been an implicit tax on producers, given that the international price was higher than the domestic price (see Norton, 1984).

11. It is assumed that the supply response is either zero or of the same proportion for all producing classes. If this were not the case and the supply response were correlated to income, the size of income per capita is overestimated. In addition, income per capita (as currently measured) does not capture the shift of producers from other crops to corn, and the effect on employment from a rise in corn output has not been estimated.

One viable alternative would be to decrease the general subsidy on tortillas and to increase the subsidy on maize flour. In comparison to tortillas and maize dough, flour can be produced and distributed with larger government participation and more effective surveillance, especially because of its nonperishable quality. At present, maize flour is not an important item in the target population's consumption basket. However, this can change if relative prices change (that is, if tortillas made at home from flour become cheaper than purchased tortillas) and if a vigorous advertising and information plan is implemented simultaneously. The advantage of transferring part of the funds involved in the general subsidy on tortillas to a general subsidy on maize flour is that a subsidy on the latter is more self-targeting. The subsidized price of flour for final consumption should be set as low as or higher than that used for industrial purposes; otherwise, most of the benefits would be captured by millers.

The second approach is to take the subsidy to the net purchasers of unprocessed maize in the rural and semirural areas, who do not benefit from the present subsidy because they make their own tortillas but are hurt by an increase in the price of maize. Their situation may be exacerbated by the seasonal variation in the price of maize. To make the subsidy more equitable and to improve the living conditions of the poorest population, the government could compensate net purchasers of maize flour. This compensation should be at least equal to the imputed wage of the unpaid family labor in making the tortillas at home plus whatever increments occur in the price of maize. Thus the cash constraint that prevents the rural poor from purchasing tortillas (and thereby benefiting from the subsidy) is removed; this would (at least partially) correct a situation where an improvement in the living standards of the poor producers of maize (from a rise in the corn price) is paid for by the poor consumers of maize.

This compensation could be a direct transfer or an inframarginal program (such as ration shops, food stamps, or on-site distribution), since both are expected to have equivalent effects. The decision as to which program to follow would depend on the cost of policing the program, as well as on the characteristics of the places where the programs are to be implemented.

Such a scheme, however, implies further government outlays, something that at this time of crisis would not be welcome unless these outlays are compensated for by additional revenues. Where could these revenues come from? If the tortilla subsidy were a less sensitive political issue, they could be obtained partially from the funds saved by better targeting of the tortilla subsidy. Moreover, since 1973 the share of subsidies for maize has decreased while the shares for wheat and sorghum have risen, and the general subsidies on wheat and sorghum products are more inequitable than the subsidy on tortillas (Garcia-Alba and Serra-Puche, 1983). It would

therefore make sense to start by better targeting wheat and sorghum subsidies and using the funds saved in this way to finance the compensatory program for the net purchasers of maize.[12] On the other hand, given the concentration of income and wealth in Mexico, the best alternative from an equity point of view might be to finance the compensatory program through progressive income and property taxes.

12. For example, subsidized wheat flour could be sold in CONASUPO stores, and a ration card system similar to that for milk could be introduced for eggs.

21 Design, Income Distribution, and Consumption Effects of Maize Pricing Policies in Zambia

SHUBH K. KUMAR

Organization of Maize Marketing Parastatals

The organization of maize marketing in Zambia reflects the main objective of the system—supplying urban areas with cheap food. Maize purchased from farmers is sold only to the major milling companies, all of which are located in urban centers. The marketing subsidy, reflected in the low sale price to these millers, is in effect a subsidy to mainly urban consumers. Rural retailers are allowed an explicit markup to cover transport costs back to rural areas. However, to the extent that the price of milled maize purchased in urban areas incorporates not only an explicit transport subsidy but also storage and often milling subsidies as well, the rural consumers of the purchased meal may also be deriving some price advantage. This is of course in addition to the implicit subsidy via a somewhat lower domestic price and inflated exchange rate that has remained part of the situation during most of the past twenty years. It should be noted that this analysis represents the situation only up to the mid-1980s, prior to the recent inflationary and exchange rate changes.

In rural areas, the primary producer cooperatives run the maize collection depots, which are open to both members and nonmembers for sale of their maize. Sometimes cooperatives may handle other commodities as well. In areas covered by a provincial cooperative union but not serviced by a primary cooperative, the provincial cooperative sets up marketing depots (for purchasing grain from farmers only). The provincial cooperatives transport the grain to urban centers for storage. From there, any estimated surplus is transferred to the national parastatal grain board—NAMBOARD—which places it for storage and release to millers in the deficit provinces. In provinces where the cooperative structure for rural purchases does not exist, NAMBOARD operates the rural depots itself. Gradually, however, efforts are being made to expand coverage of provincial cooperatives.

Preindependence Maize Policies

Maize Prices

It is clear from historical evidence that government policies have played a central role in evolving patterns of production and marketing for maize. Urban interests have generally dominated this policy process, stemming initially from the importance of mining in the gross national product. From the time of the opening of the first mines during the early 1900s, there was a need for low-cost wage goods for workers. Large-scale settler agriculture was encouraged, and a market was assured for their maize crop through a combination of domestic marketing and export subsidies (in years of surplus production). Until the 1930s, the traditional African farming sector was seen mainly as a source of labor for the mining industry.

Consumer subsidies and state control of maize marketing have remained the cornerstone of maize policies in Zambia for at least fifty years. Prior to independence in 1964, an additional policy element had been the relative protection of settlers at the cost of African agriculture. This combination of policies produced the desired result of a rapidly expanding urban industrial labor force to work the mines in the post-World War II boom years. At only two points in preindependence history were consumer subsidies curtailed: in the Depression years of the 1930s and in the late 1950s when urban unemployment was beginning to be a problem. The consumer subsidy went almost exclusively to mining and urban workers, but the purpose of the subsidy was not so much to aid workers as to provide the industry with a steady supply of labor.

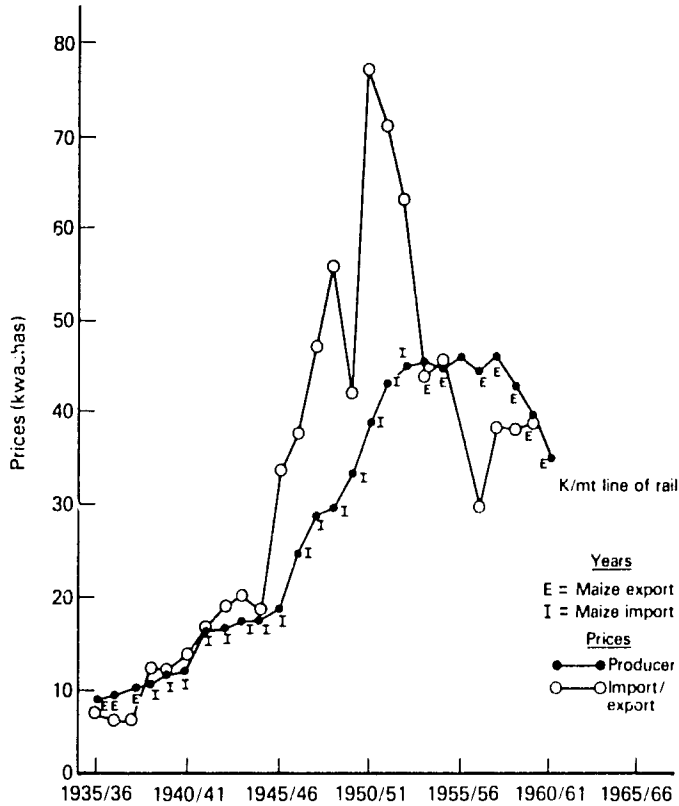
From the time of the first official marketing board in 1935 until independence in 1964, three main policies were in effect for maize.[1] First, producer prices were set on the principle of producer cost plus "fair" returns. In effect, however, prices appear to have been roughly between import (high) and export (low) prices, being above the export price in surplus years and below the import price in deficit years (see figure 21.1). Second, the consumer price for maize was kept consistently below the price received by producers, except during the 1930s when the Depression caused a temporary setback in the mining industry. And third, African producers received about 30 percent less for their produce than European producers.

Smallholder Agriculture

Preindependence pricing and marketing policy for maize for the most part neither encouraged growth or production by African farmers nor growth of traditional grain markets. According to Dodge (1976), the main

1. The North West Rhodesia Farmers Cooperative Society, which earlier marketed maize for European farmers (for local sales and export), continued to act as the agent of the new Maize Board.

FIGURE 21.1 Preindependence producer prices for maize in Zambia



concern at the time the maize board was established was "to ensure that African production did not take up an increasing share of the limited market" caused by the Depression and the associated slump in the local mining industry. "The quota system which was instituted had a depressing effect on the growth of African cash sales which was mitigated only by a rise in world prices and growth in the domestic market in the 1940s." At the same time, the monopoly on maize purchases by the Maize Control Board "no doubt seriously impeded the development of private marketing, since it prevented the spreading of overhead costs and the generation of a sufficient volume to make the marketing of other crops economical."

When the domestic demand for grain rose in the 1940s, so did world-market prices, and the cost of imports rapidly escalated. At this time, "government policy toward African agriculture took the form of improved farming schemes and soil conservation efforts" in the line-of-rail and Eastern provinces (Dodge, 1976). Most of the commercial maize production

in the traditional farming sector is still derived from these parts of the country.

International Parity Price

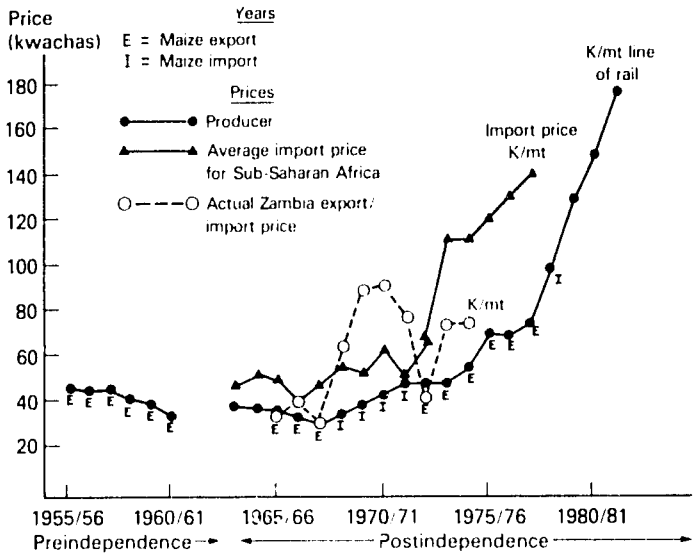
As far as producers were concerned, a superficial comparison with international prices faced by the country would suggest that (1) producers were taxed in more years than they were subsidized; (2) on balance, the size of the tax on producers was larger than the subsidy; and (3) producers were subsidized in exporting years and taxed in importing years. On the other hand, it is clear that any attempt by the state to match or even to predict the volatility of international prices is extremely difficult. The pattern of the swings in international prices in any year suggests two reasons. First, there is a wide gap between import and export parity prices, consistent with Zambia's landlocked situation and difficult overland transport situation. Second, the import or export situation in any year is largely a condition shared by the rest of the white maize-producing and maize-consuming regions of Africa as well, leading to parallel shortages and surpluses and giving an immensely volatile international price picture for trading in this commodity. The wide gap between import and export parity prices is also clear from the next section, which tracks the postindependence pricing policy for maize. It is clear, however, that setting producer prices consistent with opportunity costs, while at the same time balancing producer and consumer interests, is probably not possible with simple-minded "international" price comparisons.

Postindependence Maize Policies

Although the basic policy frame for maize policies did not alter during the postindependence period, additional objectives were superimposed on earlier ones. One was the broadening of the geographical range of commercial participation of maize producers by introducing uniform pricing in 1974/75, after earlier attempts to subsidize producer prices in selected outlying provinces. During this time, line-of-rail prices remained relatively static and slightly below the cost of importing maize (figure 21.2). Other measures, such as fertilizer subsidies and intensive rural development programs to broaden participation in commercial maize production, were also stepped up following the steep international price rise in food commodities after 1974. At the same time, however, consumer prices were kept low. By 1977 both the volume of maize handled by the marketing board and the nominal consumer subsidy per bag of maize were at an all-time high (table 21.1).[2] More recently, maize subsidies were reduced between 1980/81 and

2. This assumes that the international equivalent price is taken as the average import price for sub-Saharan Africa.

FIGURE 21.2 Postindependence producer prices for maize in Zambia



1983/84. Sharp devaluation of the kwacha since 1985 and the attendant inflationary burden have resulted in a reemergence of the maize subsidy. At the end of 1986, under pressure from the lenders' structural adjustment requirements, the government doubled the consumer price of maize meal. This did not last long; food riots broke out, and the subsidized prices were reinstated.

In the postindependence period, the general impression is that degree of taxation of producers via maize prices is more consistent on a year-to-year basis than in the preindependence period. This was certainly the case as far as line of rail was concerned, where the large-scale commercial agriculture is mainly located. But from the standpoint of the majority of farmers, namely those located beyond the line of rail and in outlying provinces, the prices offered by the parastatals were, depending on the area in question, at or above their "international equivalent" producer price, if transport costs to line of rail alone are taken into consideration. This was the case until the 1973/74 international price increases occurred. Between 1973/74 and 1977/78, when the gap between the average import price and line-of-rail producer price was historically the highest, the outlying provinces were receiving nearly 85–90 percent of their international equivalent price.

An examination of the basis for the policy of subsidizing producer prices in outlying areas at the cost of line-of-rail producers reveals two main concerns of policymakers in Lusaka. The first and major concern was

TABLE 21.1 Trends in the consumer subsidy for maize, Zambia

Year	Producer Price (k/90 kg)[a]	Maize Meal (90% extraction) (k/90 kg)		Nominal Consumer Subsidy (% of retail price)
		Value-Added Consumer Price[b]	Actual Retail Price[c]	
1970	3.50	6.05	4.80	26.0
1971	4.00	6.71	5.20	29.0
1972	4.30	7.20	5.58	29.0
1973	4.30	7.38	5.58	32.3
1974	4.30	8.04	5.58	44.1
1975	5.00	9.24	5.58	65.6
1976	6.30	11.18	6.94	61.1
1977	6.30	11.93	6.95	71.7
1978	6.80	13.04	8.39	55.4
1979	9.20	16.32	14.22	14.8
1980	11.70	19.81	14.22	39.3
1981	13.50	22.51	18.81	19.7
1982	16.00	26.18	23.40	11.9
1983	18.30	30.34	30.42	0.0
1984	24.50	39.31	37.15	5.8
1985	28.32	47.39	37.15	27.6
1986	55.00	82.60	51.79	59.5

SOURCES: Zambia, *Agricultural Statistical Bulletin*; Zambia, *Consumer Price Statistics*; NAMBOARD, *Annual Report and Accounts*.

[a]Price received by farmers, not including fertilizer subsidy.
[b]Includes transport, storage, and milling costs; based on NAMBOARD figures for selected years, with adjustments for other years based on the inflation rate for the year.
[c]At year's end for roller meal.

to broaden the economic participation of farmers in potentially rich but heretofore neglected outlying provinces. Second, it was also expected to lessen the political clout of commercial agriculture by diversifying the sources of domestic food supply.

Fiscal Costs of the Maize Marketing Subsidy

The three main components of the explicit costs of maize pricing policies in Zambia are the operations of the provincial cooperative unions, NAMBOARD, and the deficits incurred by the milling companies. In most years, the accounts of the provincial cooperatives have been balanced by NAMBOARD, as they are seen to be largely an instrument for implementing national pricing policies. This is the case for the period from which the figures on NAMBOARD accounts are available. In the post-1978 period, for which figures are not readily available, NAMBOARD budget deficits

were becoming very visible, and efforts were under way to strengthen the regional cooperatives and make them more autonomous in activities and accounts while they remained instruments of state policy—serving to diffuse the focus on NAMBOARD but also making it difficult to trace the fiscal costs of maize marketing. This transition was largely achieved during the 1980/81 period, when the country was under increased pressure from the International Monetary Fund to eliminate all food subsidies, especially the visible maize subsidy implemented by NAMBOARD.

Finally, accounts that are most difficult to obtain are those of the milling companies. In their case, the government directly reimbursed them for the deficits they reported on their maize milling. It is expected, however, that this is not a significant figure, because estimated margins were built into the differential between purchase price and sale price.

The size and composition of the marketing subsidy for maize, leading up to the peak cost in 1977, is shown in tables 21.2 and 21.3. The subsidy for maize accounted for more than 10 percent of GDP in agriculture at the height of the program in 1977. This was not an inconsequential amount, and though it did not come out of the agriculture budget, it represented the equivalent of about 50 percent of the total government budget for agriculture and rural development during this period, and twice the amount of gross fixed capital formation in agriculture, forestry, and fisheries.

Effects of the Maize Marketing Subsidy

Effect on Markets

The main effect of the government purchasing monopoly has been to inhibit the growth of markets in rural areas. Whereas in theory the trade of other uncontrolled food commodities is still possible, in practice it is limited by the small surplus in those commodities and is carried out mainly by small entrepreneurs.[3]

Because consumer subsidies for maize on the line of rail had been in place since the 1930s and few incentives were present at that time for growth in African agriculture, the development of rural to urban markets for agricultural products was virtually nonexistent at the time of independence in 1964. It was expected that if the markets for maize were liberalized but prices to remote producers and the subsidized prices paid by urban consumers were maintained, then the explicit subsidy would be far larger than if the state continued to market all the maize.

However, there is sufficient evidence that the maize marketing policy has impeded growth of rural to urban markets. It has also discouraged

3. All nonfood agricultural products, such as cotton, sunflower, tobacco, and soybeans, are similarly marketed only by the parastatals, primarily as a result of a uniform pricing policy and control of exports.

TABLE 21.2 Fiscal cost of maize marketing policy, Zambia

Year	Maize Subsidy (million k)	Gross Domestic Product in Agriculture[a]	Maize Subsidy as a Percent of GDP in Agriculture
1973	13.5	180.9	7.5
1974	11.8	199.4	5.9
1975	19.8	206.4	9.6
1976	26.6	273.3	9.7
1977	33.5	321.5	10.4
1978	31.9	382.0	8.4
1979	11.2	424.3	2.6
1980	30.2	468.0	6.5
1981	25.8	539.1	4.8
1982	15.8	508.0	3.1

SOURCES: Zambia, *Agricultural Statistical Bulletin*; Zambia, 1986; NAMBOARD, *Annual Report and Accounts*, 1974–76; World Bank 1981.

NOTE: 1973–76 maize subsidies derived from NAMBOARD; 1977–82 subsidies were estimated.

[a]Includes forestry, fishing, and hunting.

TABLE 21.3 Breakdown of NAMBOARD cost in maize marketing, Zambia (million kwacha)

Expenditure Item	1973	1974	1975	1976	1978[a]
Transport and storage	1.6	4.1	5.5	8.2	6.7
Discount price to millers	6.9	0.4	6.3	9.6	3.5
Administrative	5.0	7.2	8.0	8.8	9.1

SOURCE: NAMBOARD, *Annual Report and Accounts*, 1974–76.

[a]Estimated.

rural storage for off-season sales in rural areas themselves, and this is reflected in the absence of a seasonal price increase for maize in areas where subsidized maize meal is readily available. This is contrary to the observation for freely traded food commodities. Variations in local prices for rice, beans, sorghum, and groundnuts suggest that the markets, though they may be rudimentary and the quantities involved may be small, do work. This is reflected in the patterns of both regional and seasonal price differences.

Effect on Producers

There are at least three facets of the effects of maize pricing policies on producers: effects by region, effects by size of farm, and long-term effects on the level and stability of production.

Most of the analysis done on producer prices has been for producers along the line of rail. This work shows that in most years there has been an effective tax on producers when compared with the import price for maize (Dodge, 1976). As might be expected, however, the same result does not hold when producers from provinces not on the line of rail are considered—except for a few years in the mid-to-late 1970s, when world prices shot up dramatically. Producer price subsidies in outlying areas vary from region to region, because transport cost differs for each region and also because prices were set at varying levels above the line-of-rail price for different provinces from 1965 until 1974, when a uniform price was established across the entire country. Generally, producers in the outlying and poor provinces were subsidized in the postindependence period, and line-of-rail producers were taxed as a result of maize pricing and marketing policies.

Whether producers were subsidized or taxed, they were affected to the extent they were engaged in the marketing of their maize crop. Aggregate statistics are weak in this regard. While it is possible to determine the size of the marketed maize crop by district and province, it is difficult to trace this information to the farms where the surplus originated. Results of a survey conducted in 1981-83 in Chipata District (one of the moderately commercialized districts of Zambia) by the International Food Policy Research Institute jointly with the Zambian National Food and Nutrition Commission (NFNC) and the Rural Development Studies Bureau (RDSB) of the University of Zambia show that 93 percent of maize sales originated from farms having seven or more acres of total cultivated area. These farms accounted for only 19 percent of all households growing maize.

Limited information available on aggregate maize production trends for different parts of the country suggests that the better infrastructurally endowed line-of-rail provinces are more price responsive but, at the same time, had a better growth rate during the 1970s than the outlying provinces (Kumar, forthcoming). These results are contrary to growth predictions based on the regional distribution of producer price subsidies alone.

Effect on Consumers

The basis for drawing consumption implications of maize subsidies at the national level is somewhat sketchy. The last survey for which results are available was done in 1974/75. To this was added material from the IFPRI/NFNC/RDSB survey on the distribution pattern of purchased maize in the rural population.

Several factors could influence the effect of maize policies on consumption: (1) the place of maize in the diet and the way its consumption changes with income and price would influence the regional and intraregional distribution potential for a consumption effect with access to the

consumer subsidy; (2) the pattern of maize purchases by income level and by season would determine the size of the subsidy received by different groups; and (3) actual consumption, in conjunction with marginal propensities for consumption and level of subsidy received, would determine net consumption benefits. Actual consumption is especially useful to know, because increasing consumption at low levels by a given amount has a greater value for nutritional adequacy than if the same increase were taking place at a higher consumption level. Each of these three points is examined based on the evidence available.

First is *the place of maize in the diet.* Maize is the main staple for the majority of the population in Zambia. However, there is a fair diversity of diets, even though maize is grown and consumed nationwide. The predominantly maize-consuming areas are urban areas and those rural areas along the line of rail, where the bulk of the country's population is located. In addition, in the Eastern Province, which still has large sorghum-producing areas, maize is the main staple. In the Western and Northwestern provinces, sorghum and cassava in addition to maize form the staple foods, whereas in the high-rainfall Luapula and Northern provinces, tapioca and finger millet practically replace maize as the staple food.

Urban areas have the highest maize consumption on a per capita basis. It was calculated from the 1974–75 expenditure survey from urban areas that the poorest 5 percent of households in urban areas spend 76.9 percent of their total expenditure on food but only 19.25 percent on cereals; the expenditure elasticity for cereals for the poorest 50 percent of the population is 0.32. The median income household in urban areas spends about 60 percent of its income on food and about 12 percent on cereals.

The average rural household spent 19 percent of total expenditure on cereals and about 75 percent on food. Thus the average rural household matched the expenditure pattern of the poorest 5 percent of households in urban areas. This would suggest that the potential effect of an income transfer on consumption might be much greater for the rural than for the urban population.

The second and third factors are *the pattern of maize purchases* and *actual consumption.* Access to the consumer subsidy for maize is with purchased maize meal only and not with home-produced maize that is consumed. In urban areas, the major components of the diet are purchased. For the country as a whole, 17.4 percent of households in urban areas and 19.5 percent in periurban areas were reported to be surplus producers in the census of agriculture, 1970–71 (surplus production covers all agricultural products). However, some maize is planted on small farms located in urban or periurban areas. If for the sake of simplicity it is assumed that all maize consumed in urban areas is purchased, and if maize contributes 90 percent of cereal expenditure at the lowest income levels, the poorest 5

percent would have purchased and consumed 444 grams per capita per day of maize and somewhat under 500 grams per capita per day of all cereals in 1974/75. The poorest 5 percent of the urban population spent only 17 percent of their total income on maize. Because maize prices were low relative to the incomes of the poor, even if there were a 25 percent subsidy on the retail price of maize, the income transfer to this group would amount to a mere 4.3 percent of their total consumption expenditure. These observations lead to the conclusion that the maize subsidy alone has not been a major contributor to increasing consumption levels for even low-income groups in the urban population. Under the current inflationary environment, however, the conclusions may be quite different.

The 1981-83 IFPRI/NFNC/RDSB survey in the Chipata District found that, for plateau households, about 60 percent of maize calories were purchased by the smallest landholding groups—those cultivating less than three acres. It should be pointed out that the absolute quantities purchased are very low for this sample, at least during the year in question. The scale of purchases in the valley areas of Chipata are expected to be larger.

Consumption of maize is highest for all farm sizes during the planting season. This reflects the heavy farm work at that time. For the smallest farmers, the peak in purchasing occurs during the planting season, during which time consumption of all groups is at their highest for the year. However, during the weeding and late-planting period of February/March, purchases of these groups fall off and those of the larger farmers increase sharply. If this pattern holds for larger population groups, and if consumer price subsidies are being transmitted to these groups, it could have significant consumption implications for smaller households with net deficits, since their total income is much lower than that of the urban population.

Conclusions

Based on the available evidence, it appears that the beneficiaries of maize subsidies have been, in order of probable size of transfer per household: larger farmers outside the line of rail, urban consumers, and small deficit farmers, especially along the line of rail. On an aggregate basis, the beneficiaries have been urban consumers, larger farmers outside the line of rail, and small deficit farmers.

Though this is still being researched, the nutritional effect of these transfers is likely to be positive for the small-scale deficit farmers. In the current economic environment, low-income urban households may also derive significant nutritional benefits. On the production side, it is paradoxically in the line-of-rail provinces, where price comparisons with the international equivalent price would suggest a disincentive to produce,

that production of maize has grown most rapidly, though only in the traditional sector. While not explicitly examined in this chapter, it appears that the large-scale commercial agricultural sector is much more responsive to price changes than the traditional sector. It is not clear to what extent the growth in production that occurred in these provinces near the railroad was a result of expansion in access to agricultural services and improved marketing. Availability of subsidized maize to small-scale producers during periods of seasonal food and labor shortage may also have had a positive effect on production in the areas near the rail lines. Relatively limited growth in production of maize appears to have occurred in the outlying provinces, where price support was provided.

22 Distributional Consequences of Alternative Food Policies in India

HANS P. BINSWANGER AND
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A number of large and poor economies such as India, China, and Bangladesh are not open economies but economies where the state controls trade in food and also many nonfood items. Food policy interventions such as food aid, supply-oriented interventions, or ration shops alter the balance of supply and demand for food and can therefore be expected to affect food prices unless they are accompanied by compensating variations in imports or exports. In this chapter, various food policy options in India are investigated, and their direct and indirect effects on consumption via prices and real incomes are examined.

Although the effects of these policies on the cereal consumption of the poor will be shown, the main attention of this chapter will be concentrated on the consequences on real income of these policies. First, food consumption and real income are highly correlated. Moreover, it is now widely accepted that lack of food security is more a matter of the inability of the poor to purchase food than of a general shortfall in food supply (Reutlinger and Selowsky, 1976; Sen, 1981). In considering food security issues, it is the effect of food policies on poor people's income, not the effects on supply, that are of primary importance. This does not, of course, detract from the importance of supply issues in other contexts.

Much of this chapter will be devoted to contrasting various food subsidies with supply-oriented policies. Food subsidy policies are policy packages that implicitly or explicitly imply decisions on (or consequences for) at least three policy dimensions.

The first of these is targeting. Who is to receive the subsidy? The subsidy may be untargeted, that is, it may simply be reflected in a lower open-market price, or it may be targeted to specific groups. Two options are considered: urban ration shops, which target the subsidy to all urban groups, and a food stamp scheme, which targets the subsidy to all of the poor, regardless of place of residence.

The second policy dimension is procurement of additional supplies. Where do they come from? The extra demand for food can be accommodated by extra imports, in which case there will not be a price effect. On the other hand, if imports are not increased, the extra demand must be met by domestic producers, who will be unwilling to supply more food unless prices rise.

Third, how is the food subsidy financed? Three options are considered: foreign aid, an excise tax on nonagricultural consumer goods, and a forced levy of foodgrains from the two largest farm-size groups. Other ways of financing not considered here include income taxes, inflationary deficit financing, and reductions in other government expenditures.

In discussing food subsidy issues, it is sometimes argued that finance issues should be ignored, as it is often not possible to match the food subsidy with a specific source of finance. For example, suppression of a food subsidy could lead the government to engage in some other form of expenditure, whose direct and general equilibrium effects cannot be evaluated. Although this is undoubtedly the case, it is possible to show the implications of various financing schemes, each with sharply different initial incidence. As will be shown below, alternative financing schemes have vastly different implications, which reinforce or offset the distributional objectives of the food subsidy.

In the general equilibrium model of India's agricultural sector presented here, all three dimensions will be considered explicitly. However, there are at least three additional effects that are not captured. These are the effects of food policies on the foreign exchange market, on nonagricultural employment and wages, and on private investment. These issues will be discussed informally later in this chapter, along with some studies that are able to incorporate them formally.

A Brief Overview of the Model

The model used here has been described in Quizon and Binswanger (1986). It is a general equilibrium model of the agricultural economy of India in which agricultural production, prices, and incomes are determined endogenously for given levels of nonagricultural production and nominal nonagricultural incomes. Real incomes, however, are endogenously determined as nominal incomes, deflated by a price index that depends on food prices. Total demand for agricultural commodities reflects the real incomes of all groups—that is, the food price effects of policies affect the demand of both rural and urban consumers. Nonagricultural commodities are the numeraire, and the model does not endogenously take account of exchange rates and trade issues or of monetary phenomena.

Producer Core

The producer core of the model is a system of output supply and factor demand equations that describe producer behavior in each agroclimatic region. This core determines the aggregate supply of rice, wheat, coarse cereals, and other agricultural commodities. It also determines aggregate demands for variable factors, including labor, draft power, and fertilizer. Shifter variables like land (a fixed factor), rainfall, irrigation, high-yielding varieties, roads, farm capital, regulated markets, and technological change, may shift each of the supply and demand curves.

The parameters of this system were econometrically estimated for each agroclimatic region and aggregated to obtain the parameters for India as a whole. A flexible functional form was used, and all cross-price terms, including those between inputs and outputs, were estimated. No separability restrictions were used. The agroclimatic regions are the northern wheat region, the eastern rice region, the coastal rice regions of south India, and the semiarid tropics.

Input supplies to agriculture were determined as follows: land, which is exogenously given, is supplied only by the rural groups; labor is responsive to the real rural wage and is supplied by each of the rural groups and by urban groups via migration[1]; draft power is responsive to real rental rates for draft animals and is supplied by each of the rural groups; and fertilizer is responsive to the price of fertilizer relative to nonagricultural goods and to the prices of agricultural output.

Consumer Core

The consumer core of the model consists of output demand equations. Commodities are demanded by each of the eight income groups (quartiles of rural and urban expenditure distributions) according to the prices of the commodities and according to each group's real income. Each group's demand was modeled separately according to its demand elasticities—that is, poorer groups have higher income elasticities than richer groups. The demand systems were estimated econometrically. A flexible functional form was used, so that all Slutzky substitution terms were directly estimated. Aggregate demand is the sum of each group's demand.

Then the nominal income of each group was computed, multiplying the respective supplies of factors of production by the factor prices, plus an exogenously given component of nonagricultural income. Real income is defined as nominal income, deflated by an endogenous consumer price index. The price index reflects all endogenous food price changes and is specific to each income group.

1. As nonagricultural output is given, changes in migration will create excess demand or supply of labor in the urban sector—or unemployment.

Prices and Quantities

Prices and quantities were determined by equating aggregate demand with aggregate supplies for each of the four agricultural outputs and the three variable inputs. Quantity of land is exogenous, but land rent is determined endogenously as the residual farm profits after variable factors have been paid off. Nonagricultural prices are given exogenously, and the quantity consumed adjusts.[2]

The model solves for these price and quantity changes and simultaneously determines for each income group the change in nominal income, the price deflator, real income, the labor and draft power supply, and consumption. The entire model is written in logarithmic linear form.

Finally, unless otherwise noted, the reference year is 1973/74. Beginning prices, quantities, and shares were computed largely from a variety of sources, primarily the National Council for Applied Economic Research/Additional Rural Income Survey (Pal and Quizon, 1983).

Food Subsidies in a State Trading Economy

Tables 22.1, 22.2, and 22.3 report the likely effects of particular government intervention schemes on various economic indicators of general concern to policymakers. The numbers show the percentage change of a particular indicator (say, real national per capita income) in a selected intervention scheme from an underlying reference growth path. This path is not modeled, nor are the administrative costs or the political risks associated with any particular government scheme considered. These costs and risks may differ widely from scheme to scheme.

As mentioned earlier, a food subsidy involves explicit or implicit decisions on targeting, imports, and finance. Scenarios 1 and 2 in table 22.1 are untargeted food subsidies: U.S. $1.1 billion are used to finance the import of almost 7 million tons of wheat, which are released in the open market. In scenario 1, these imports are aid-financed and add about 0.5 percent to real national income. In scenario 2, imports are financed by a domestic excise tax on household consumption of nonagricultural commodities of about 8.5 percent, which leads to a decline in disposable income of 2.5 percent. Both scenarios sharply reduce the wheat price by about 60 percent. The prices of other agricultural commodities that are substitutes for wheat also decline. The joint effect of the price declines is a decline in the gross national product deflator by about 19 percent. Wheat production declines about 18 percent. The decline in rice production is

2. As nonagricultural income is exogenously given, nonagricultural production is also exogenously given—that is, consumption must adjust via trade.

minimal, whereas coarse grain production and other crop production actually increase modestly. Thus aggregate agricultural supply declines by only about 0.6 percent.

This small decline in output hardly affects agricultural employment but leads to modest declines in real rural wages of between 1.0 and 1.6 percent. As shown in table 22.1, the decline in agricultural price sharply decreases residual farm profits, which are very sensitive to agricultural price changes. (Wage rates and employment are rather insensitive, an issue to which we will return in the next section.)

The big gainers in both scenarios are the urban poor, whose real incomes rise by about 18 percent. Other urban groups gain as well, but because they spend proportionately less on food, their relative gains are smaller. The rural poor (the poorest 25 percent), despite their loss in wages, gain about 4–5 percent. This arises because food price declines dominate the negative wage effect. All other rural people are net losers, as the sharp decline in farm profits outweigh their consumption gains from the food price drop.

The next four scenarios provide food subsidies to urban residents only through ration shops. These shops provide each member of the urban population with the same amount of subsidized food, irrespective of income. The amounts are set so that the poorest urban group obtains an initial nominal income boost of 10 percent. It is further assumed that the food rations are either inframarginal or that the excess over demand can be easily resold in the open market. This allows each scenario to be modeled simply as a nominal income transfer.

In scenarios 3 and 4, the import and financial arrangements of scenarios 1 and 2 are repeated. The supplies for the fair-price shops are imported. The imports are financed through aid in scenario 3 and through excise taxes in scenario 4. Both wheat and rice are imported, but because wheat is much cheaper internationally than rice, imports concentrate on wheat. Two million tons of wheat and 0.8 million tons of rice are imported for a total of U.S. $560 million.

In the next two scenarios the source of supplies shifts to the domestic producer. In scenario 5, the same excise tax of 5.25 percent levied in scenario 4 is used to procure supplies domestically, while in scenario 6, supplies come from forced procurement from the two richest rural quartiles, with the fourth quartile having to contribute twice the quantity of the third quartile. These procurement taxes amount to 1.63 percent and 3.26 percent of the nominal incomes of these two groups.

When supplies for ration shops are imported, the urban poor experience a double gain: first, they receive an initial boost in income of 10 percent, and second, lower food prices affect the gross national product defla-

TABLE 22.1 Changes in economic indicators from untargeted food subsidies and urban ration shops, India, 1973/74 (percent)

Assumptions and Variables	Untargeted Food Subsidies	
	Scenario 1	Scenario 2
Assumption		
Targeting	None	None
Procurement	Foreign supply	Foreign supply
Financing	Aid	Excise tax
Variable		
Real national per capita income	0.500	−2.513
Production	−0.624	−0.622
Rice	−0.503	−0.741
Wheat	−17.318	−19.120
Coarse cereals	8.018	9.978
Other crops	2.063	2.090
GNP deflator	−20.154	−18.236
Price		
Rice	−29.209	−29.552
Wheat	−59.036	−62.106
Coarse cereals	−21.066	−18.224
Other crops	−17.831	−18.113
Real wage rate	−1.090	−1.565
Labor employment	0.099	0.019
Real residual profits	−34.413	−38.814
Real per capita income quartiles		
Rural 1	5.189	4.311
Rural 2	−0.194	−1.564
Rural 3	−3.922	−5.779
Rural 4	−11.466	−14.542
Urban 1	18.862	17.819
Urban 2	18.330	16.744
Urban 3	16.054	13.807
Urban 4	9.025	5.050
Per capita cereal consumption		
Rural 1	6.153	5.830
Rural 2	0.700	1.246
Urban 1	20.532	20.079
Urban 4	0.973	0.940

tor by 2.7 percent in scenario 3 and by 1.5 percent in scenario 4. Because the urban poor spend little on nonagricultural commodities, the excise tax has only a minimal effect on them.

On the other hand, when the extra demand of the urban groups is not accommodated by imports, food prices rise, leading to increases in the gross national product deflator of 6.6 percent in scenario 5 and 2.3 percent

Urban Ration Shops			
Scenario 3	Scenario 4	Scenario 5	Scenario 6
Urban ration shops Foreign supply Aid	Urban ration shops Foreign supply Excise tax	Urban ration shops Domestic supply Excise tax	Urban ration shops Domestic supply Forced procurement
1.728	0.282	0.4719	0.3934
−0.171	−0.169	0.1930	0.0835
−0.388	−0.532	0.3065	0.0282
−4.123	−5.238	0.7906	0.4216
1.517	2.729	−0.6478	0.1485
1.027	1.044	0.2508	0.1377
−2.726	−1.539	6.6191	2.2664
−4.918	−5.130	7.3881	2.9924
−11.863	−13.761	8.0484	3.5874
−2.909	−1.152	7.1634	3.0827
−0.684	−0.858	6.6238	2.9215
−0.505	−0.799	0.3880	0.1155
−0.090	−0.139	−0.1984	−0.0077
−3.043	−5.764	8.6805	4.6841
0.864	0.321	−1.8233	−0.5182
0.328	−0.519	−0.3716	0.2363
−0.054	−1.203	0.5050	−0.9027
−0.873	−2.774	2.1849	−1.5439
12.652	12.007	4.5240	8.0958
10.372	9.391	1.8657	6.0317
7.392	6.002	−0.5455	3.6917
3.763	1.305	−2.4027	1.9718
1.686	1.487	−1.2159	−0.5056
1.465	1.802	1.7766	−0.3170
11.294	11.014	3.0887	5.7458
1.841	1.821	1.2374	1.1470

in scenario 6, and a corresponding erosion of the initial income gains of the urban poor. The urban rich, who spend relatively little on food and much on nonagricultural commodities, are affected as much or more by the excise tax than by the higher food prices. They gain about 4 percent of real income when food imports are aid-financed, but they lose 2.4 percent when domestic supplies are financed by excise taxes.

TABLE 22.2 Changes in economic indicators from food stamp subsidies targeted to the poor, India, 1973/74 (percent)

Assumptions and Variables	Scenario 7	Scenario 8	Scenario 9	Scenario 10
Assumption				
Targeting	All poor	All poor	All poor	All poor
Procurement	Foreign supply	Foreign supply	Domestic supply	Domestic supply
Financing	Aid	Excise tax	Excise tax	Forced procurement
Variable				
Real national per capita income	4.027	−0.033	0.497	0.2727
Production	−0.370	−0.361	0.652	0.3436
Rice	−0.343	−0.739	1.608	0.3244
Wheat	−11.615	−14.684	2.195	1.1544
Coarse cereals	4.131	7.502	−1.951	−0.5441
Other crops	2.308	2.347	0.127	−0.1906
GNP deflator	−9.156	−5.737	17.105	4.8652
Price				
Rice	−14.512	−14.977	20.070	7.7057
Wheat	−35.033	−40.138	20.924	8.3725
Coarse cereals	−10.095	−5.070	18.211	6.7375
Other crops	−4.823	−5.233	15.714	5.3000

Real wage rate	−1.215	−2.037	−0.887	0.5285
Labor employment	−0.173	−0.313	−0.479	0.0578
Real residual profits	−12.351	−19.846	20.594	9.3473
Real per capita income quartiles				
Rural 1	17.618	16.069	10.066	13.7351
Rural 2	10.662	8.284	8.697	10.4048
Rural 3	−0.853	−4.061	0.719	−3.2430
Rural 4	−3.775	−9.068	4.817	−5.6751
Urban 1	20.055	18.163	−2.787	7.2576
Urban 2	16.939	14.104	−6.965	4.7500
Urban 3	6.648	2.674	−15.658	−3.7443
Urban 4	2.820	−4.126	−14.507	−2.2087
Per capita cereal consumption				
Rural 1	13.713	13.124	5.557	7.5545
Rural 4	2.932	3.881	3.808	−2.0793
Urban 1	19.986	19.116	−3.074	4.3987
Urban 4	1.755	1.692	0.059	−0.1955

TABLE 22.3 Changes in economic indicators from supply-oriented programs, India, 1973/74 (percent)

Assumptions and Variables	Scenario 11	Scenario 12	Scenario 13	Scenario 14
Assumption				
Targeting	Irrigation investment	Fertilizer subsidy	Technical change	Technical change
Procurement	None	None	None	None
Financing	No exports	No exports	No exports	With exports
	Aid	Aid	Aid	Aid
Variable				
Real national per capita income	0.488	0.255	7.197	10.199
Production	0.763	0.276	9.612	11.541
Rice	0.567	0.067	10.347	13.848
Wheat	1.002	0.241	7.493	21.113
Coarse cereals	0.541	−0.408	7.276	−0.402
Other crops	0.825	0.484	11.003	10.858
GNP deflator	−1.605	−0.230	−18.125	22.048
Price				
Rice	−2.243	−0.356	−25.948	32.417
Wheat	−3.440	−0.380	−31.236	44.461
Coarse cereals	−2.438	0.245	−33.097	16.879
Other crops	−1.676	−0.386	−19.550	26.587

Real wage rate	0.096	−0.370	−0.097	2.224
Labor employment	0.089	−0.150	0.592	0.463
Real residual profits	−1.144	1.078	−4.309	74.742
Real per capita income quartiles				
Rural 1	0.807	−0.067	9.945	0.067
Rural 2	0.497	0.148	7.258	10.203
Rural 3	0.293	0.301	5.674	17.013
Rural 4	−0.142	0.492	1.836	30.530
Urban 1	1.632	0.126	17.779	−16.645
Urban 2	1.587	0.154	17.505	−19.501
Urban 3	1.401	0.126	15.190	−17.201
Urban 4	0.904	0.083	9.832	−10.503
Per capita cereal consumption				
Rural 1	0.736	−0.057	11.143	−6.531
Rural 4	0.089	0.200	1.176	9.246
Urban 1	1.827	−0.274	16.723	−14.120
Urban 4	−0.266	−0.396	0.386	1.272

The real income of the rural poor is relatively insensitive to urban ration shops. They gain marginally under both import scenarios but lose marginally when food is domestically procured. The increases in domestic supply do not have a sufficient effect on labor demand or wages to offset the effect of higher food prices on their real income.

The rural rich lose when supplies for ration shops come from imports. But they also lose when supplies come from forced procurement. Increased demand from urban consumers does not raise open-market prices sufficiently to compensate the rural rich for the targeted tax implicit in forced procurement. This finding is contrary to the assertion of several authors that forced procurement is not necessarily a disincentive to rich producers, because the weighted average price realized by farmers may not be lower than the equilibrium price in the absence of procurement (Dantwala, 1967; Mellor, 1968; Hayami, Subbarao, and Otsuka, 1982; chapter 17). The rural rich can experience a gain only if the urban fair-price shops are financed by an excise tax or another tax with a more general incidence than forced procurement.

Of the four urban ration shop schemes, domestic procurement with excise tax is by far the least effective in raising the real income of the urban poor. Under this scheme, real incomes of the poorest urban quartile increase by less than 5 percent, compared to the 8 to 13 percent increases in the three other plans.

In table 22.2, an alternative program is explored that provides food stamps or food rations to the poorer half of the population only, namely rural and urban quartiles one and two. Food stamps are scaled so that the poorest rural group obtains an initial boost in its nominal income of 15 percent. This translates into gains in nominal income of 10 percent for rural quartile two, 11 percent for urban quartile one, and 9 percent for urban quartile two. The same four procurement and financing scenarios are explored as with the urban ration shops. The poverty-oriented program is much larger than the urban fair price shops, as half of the population now receives food aid. (The total urban population eligible in the previous scenarios is only 20 percent of India's population). To provide for the expanded program through importation, 6 million tons of wheat and 2.1 million tons of rice would have to be imported. The excise tax rate would have to be 14.8 percent of household consumption of nonagricultural goods; procurement taxes would be 4.6 percent of the income of rural quartile three and 9.2 percent of the income of rural quartile four.

As the programs are large and income is transferred only to low-income groups, food demand effects are quite large. When these increases in food demand are accommodated by imports (scenarios 7 and 8), the beneficiaries of rations gain from both price declines and the rations, with the gains of the urban poor exceeding those of the rural poor. As domestic

food production declines, the rural poor lose some employment and some wages. With foreign aid, the rural rich lose about 3.8 percent of their real income, whereas the losses of rural quartile three are insignificant. With imports financed via excise taxation, an excise tax burden is added to the farm profit losses, and the real burden of the scheme falls on rural quartiles three and four and on urban quartile four.

With domestic procurement, the added food demand leads to food price increases. These are especially large under the excise taxation scheme, where the gross national product deflator rises by 17 percent, compared to a 5 percent increase under forced procurement. With excise taxes, price rises more than offset the value of the food ration for urban quartiles one and two—that is, two of the target groups end up as net losers rather than gainers. Thus the program does not achieve one of its essential distributional objectives. On the other hand, all rural groups gain. But the gains are unevenly distributed. Rural quartile three, which does not receive a ration, just barely stays even. The effect of food prices on profits just dominates the excise tax effect and the price effects on the price index of rural quartile three. The major burden of the scheme is borne by urban quartiles three and four.

With forced procurement, food stamps continue to achieve the distributional objectives much better: all four low-income target groups show a real income gain. Large farmers bear the heaviest burden, followed by rural quartile three, urban quartile three, and urban quartile four. Employment and wage effects are minimal.

Supply-Oriented Interventions

Scenarios 11 to 14 (table 22.3) show supply-oriented interventions. These include an irrigation investment, a fertilizer subsidy, and a technical change. As these interventions affect food prices, they resemble untargeted food subsidies. These interventions are assumed to be aid-financed, making them comparable to scenario 1. In scenarios 11 to 13 it is also assumed that additional supplies will not result in additional exports (or reduced imports); in other words, all extra supplies must be absorbed domestically. In scenario 14 on the other hand, the opposite and extreme assumption is made—that all the additional supplies made feasible by the technical change are used to reduce imports or to increase exports.[3]

3. Technical change has three effects. The initial shock is the increase in yield made possible by technical change, holding input levels constant. (It is assumed that this initial shock is available for exports or reduced imports). At constant prices, farmers will find that relative profitabilities have changed and will then adjust their crop mixes. This is the secondary effect. The initial shock and the second effect, combined, then have a third set of general equilibrium effects; for example, they may depress food prices and lead to further adjustments in the supply of farmers. All three effects are traced in the model.

The costs associated with scenarios 11 and 12 are equal, and these scenarios are directly comparable.[4] Scenario 11 assumes that Rs 2,483 billion is used for a new major-medium irrigation system. At the cost of Rs 20,500 per hectare, a total of 121.1 thousand hectares of land is irrigated.[5] The benefits from this newly irrigated land are assumed to extend over fifty years, the life span of the new irrigation infrastructure. Therefore, these year-to-year benefits were first computed and subsequently discounted at 12 percent to 1980–81. Scenario 11 reports the sum of these discounted benefits. Scenario 12, in turn, assumes that the actual 1980–81 fertilizer subsidy is further increased by 50 percent, or by Rs 2,483 billion. This extra subsidy is used to reduce the fertilizer retail price by the same proportion as an increase in the government's guaranteed price to fertilizer producers.

Both policies increase aggregate agricultural output. Wheat production grows most when irrigation is increased, whereas other crops grow most when fertilizers are further subsidized. The two policies also reduce prices when domestic absorption is forced. These price declines clearly benefit urban consumers, particularly the urban poor. However, from a growth-with-equity standpoint, irrigation investment appears to be better than a fertilizer subsidy. Compared to a fertilizer subsidy, irrigation expansion results not only in higher agricultural production but also in a more progressive distribution of income. Whereas the rural poor gain from irrigation investments, they lose from a fertilizer subsidy. Fertilizers substitute for labor either directly or indirectly by changing the crop mix in favor of less labor-intensive and more fertilizer-responsive commodities. Therefore, they lead to declines in real employment or wages, with negative effects on the nominal incomes of the rural poor that exceed the positive effects on food prices. Thus fertilizer subsidies do not appear to be a good substitute for food subsidies.

Scenarios 13 and 14 assume that yields per hectare of all crops increase by 10 percent. However, because we have no cost estimates for these

4. Unlike all other scenarios, scenarios 11 and 12 assume 1980–81 as the base year.

5. This total cost per hectare is the sum of two components: a set-up cost equal to Rs 18,700 per hectare and a maintenance and operational cost of Rs 1,800 per hectare. The Sixth Five-Year Plan of the government of India assumes an average set-up cost of Rs 6,969 per hectare in 1970–71 prices for new major-medium irrigation. Assuming an inflation rate equal to that for nonagricultural commodities, this cost is equivalent to Rs 18,700 per hectare in 1980–81 prices. Maintenance and operational cost is what government has to initially set aside to cover the cost of maintaining and operating a hectare of irrigated land over the life span of the new irrigation system. Rs 1,800 per hectare is the present value of a maintenance and operational cost of Rs 216 per hectare per year (discounted at 12 percent) for fifty years, the assumed life span of the irrigation project. Rs 216 per hectare per year is derived from dividing the 1980–81 aggregate maintenance and operating cost of government irrigation systems by the actual irrigated area under major-medium irrigation.

scenarios, only the direction of change and not its magnitude should be considered when comparing them with scenarios 11 and 12.

Some but not all agricultural supply interventions can have beneficial income and food consumption effects for the poor, provided that the added supplies are used to drive down domestic prices. Scenario 14 highlights this crucial proviso. If the initial shock of the technical change (its yield effect at unchanged input levels and output prices) is used to reduce imports or increase exports, the income distribution effects are biased in favor of the rural rich. Because the extra income made possible from the technical change adds to the demand for food, prices now rise rather than fall. Thus the urban poor are big losers, followed by all other urban groups in the now familiar manner. The rural poor neither gain nor lose, as their losses from food price rises are compensated for by effects on employment, wages, and small-farm profits. The rural rich are the largest gainers. Production gains from irrigation and fertilizer subsidies could also be exported. Thus trade policy is the largest determinant of the distributional effects of a supply-oriented policy. Moreover, taxation issues, not considered here, can further alter the distributional outcomes.

Other Potential Effects of Food Policies

Several effects of these food policy packages are not considered in the model. The most important are the repercussions of the food policies on the market for foreign exchange and their effects on investment. In the absence of a formal model that explicitly takes these effects into account, it is not possible to evaluate their importance. However, a few general points and cautionary remarks are in order.

Foreign Exchange Markets

When food policies rely on domestic procurement or aid-financed imports, the balance of supply and demand for foreign exchange is not directly affected.[6] Only indirect effects via changes in demand for tradable commodities arise and, as shall be seen below, these effects are hard to predict.

When extra food is procured internationally but is financed from domestic sources as in scenarios 2, 4, and 8, the extra demand for foreign exchange can be accommodated in several ways: by a decline in the value of the domestic currency; by a reduction in foreign reserves; by a reduction in nonagricultural imports; or by a combination of these three. Scobie (1981), for example, shows that Egypt has attempted to stabilize the ex-

6. Note that, if aid is transitory but food subsidies cannot be withdrawn when aid stops, the policies will have delayed foreign exchange effects.

change rate and to accommodate the extra food imports primarily by reducing nonagricultural imports and increasing the instability of such imports. As the model used here does not trace year-to-year fluctuations, such instability effects cannot be considered.

A downward adjustment in the value of the rupee arising from increased food imports will tend to increase foreign demand for exportable goods. Whether that will lead to an increase in employment in the nonagricultural sector, however, is not clear, as the excise tax required to finance the extra imports will dampen the demand for all nonagricultural commodities (tradable and nontradable). Without a formal model, the long-run effect on the economy via the exchange rate cannot be predicted.

Investment

Although agricultural investment is not endogenously treated in the model, estimates of residual farm profits permit a prediction of what would happen to private farm investment. Food policies that rely on domestic procurement will tend to raise farm investments, whereas those that rely on imports will tend to depress it. Thus food policies that in the short run look relatively unfavorable because rising prices erode some of their benefits may be more attractive in the long run, when private farm investments lead to shifts in supply and reductions in prices. It is not possible at this time to show how important these long-run consequences are. No econometric studies exist that would enable the prediction of the extra investments forthcoming from a rise in profits. The effect of the investments themselves on supplies is more easily evaluated.

That the investment issues are potentially important is, however, demonstrated in a study of Argentina by Cavallo and Mundlak (1982). A highly aggregative, dynamic two-sector model was used to estimate static and dynamic parameters econometrically. The labor market is treated in a neoclassical fashion, but with rural to urban migration responding sluggishly to changes in demand and supply.

Cavallo and Mundlak's model simulates the period 1950–71. They first show that trade liberalization would have benefited Argentina only if it had been accompanied by exchange rate management aimed at keeping the real value of the peso at the historic level. However, they observe that such a scenario results in reductions in the urban wage relative to food prices compared to their base run. They therefore explore a scenario in which trade liberalization cum exchange rate management is accompanied by a subsidy on agricultural output. This is implemented by reducing the tax on domestic food consumption while increasing the domestic tax on nonagricultural output to hold constant the share of tax revenue in total output. The short- and long-run consequences of the scenario with food

subsidy are compared to those of the scenario with only trade liberalization and exchange rate management.[7]

In the short run (two to three years), the subsidy increases the food wages in both nonagricultural (urban) and agricultural (rural) sectors.[8] Because of the increased tax on nonagricultural goods, however, it must decrease the wage for nonagricultural commodities. Real wages therefore would increase only for the very poor, who spend a large proportion of their income on food. This group has always been much smaller in Argentina than in India. In addition, there are small short-run reductions in per capita income, per capita consumption, and investment.

In the long run, the cumulative effect of reduced investment in both the agricultural and nonagricultural sectors dominates all other effects of the subsidy. After twenty years, most relevant macro aggregates are lower than without the food subsidy: per capita income (−13 percent), per capita consumption (−12 percent), investment (−4 percent), and agricultural production (−4 percent). In addition, urban workers are unambiguously worse off, as they have both lower food and nonfood wages. Rural workers' food wage increases by 2 percent, whereas their nonfood wage declines by 1 percent. In other words, their real wage is largely unaffected.

Thus the short-run benefits of low food prices are not impressive and the long-run effects are unfavorable. These results are of course specific to Argentina. In India, the short-run distributional benefits of low food prices are substantially larger, as a much larger portion of the population spends the largest share of its income on food.

Conclusions

The models in this chapter omit a number of considerations that might have modified some of the conclusions in tables 22.1, 22.2, and 22.3. The most important of these considerations is the long-run effects of food subsidy policies on urban wages and private agricultural investments. Thus the conclusions should be regarded as most relevant for an intermediate period of one to three years, when investment and urban wage responses may not be large.

The food subsidy scenarios considered here clearly show the importance of evaluating the entire policy package associated with the food subsidy, including trade, taxation, and wage aspects. Ignoring the price ef-

7. The subsidy scenario is not compared to Cavallo and Mundlak's base run, a comparison that would be inappropriate, as other things are not held constant.

8. The food price in the nonagricultural (urban) sector is imposed to be equal to its historic values in the base run. But it is higher than in the run with exchange rate liberalization alone.

fects of trade decisions or the income effects of taxation can easily result in highly misleading conclusions about the distributional effects of the subsidies. Ignoring the rural labor market equilibrium would lead to a systematic overestimation of the income effects of food price declines on the rural poor. Several cases are shown where the trade and taxation measures lead to a complete erosion or even a reversal of the intended real income effect of the food subsidies. As real income and food consumption effects are closely related, nutritional objectives of food policies may also not be achieved. Eight general lessons surface from this analysis:

1. Untargeted food subsidies achieved via additional imports tend to benefit the rural and urban poor. However, when the labor market equilibrium is explicitly introduced into the analysis, it becomes clear that the income effects of lower food prices for the poor are quite small. In order to restore labor market equilibrium, nominal wage declines are required, and this erodes the income gains of the poor substantially.
2. Untargeted food subsidies achieved via additional imports may benefit the rural and urban poor even if they are excise-tax-financed rather than aid-financed. The incidence of the excise tax falls on the urban and rural rich. The excise tax ends up being progressive, as poor groups spend relatively little on taxed nonagricultural commodities.
3. Targeted food subsidies are required if the rural poor are to benefit substantially.
4. Targeted food subsidies have to be associated with substantial increases in supply, via imports in the short to intermediate run or via extra domestic production (and no increased exports) in the longer run. In extreme cases, some of the target groups may become net losers if food rations are not imported. More generally, the rations required to achieve a specific distributional objective are smaller when some rations are imported than when they are not.
5. There is likely to be intense conflict about import policies. The rural rich—net sellers of food—benefit from preventing imports or increasing exports, regardless of the financing or targeting scheme. Urban groups and, to a lesser extent, the rural poor—net buyers of food—tend to benefit from the opposite policies. The conflict, then, is not between urban and rural groups but between net buyers and net sellers.
6. Taxation issues do not involve the potentially taxed groups alone. A shift of the tax burden from the rural rich (as under forced procurement) to all groups (as under the excise tax) has general equilibrium effects that alter the incomes of the target groups via food prices. Taxing the rural rich reduces aggregate food demand more than taxing all groups through an excise tax. Therefore, the poor target groups of the

food subsidy benefit more from the forced procurement scheme than from the excise tax-financed scheme.

7. None of the food subsidy schemes greatly affect agricultural employment and wages. Domestic procurement tends to slightly increase agricultural employment and wages, as domestic supplies increase, while foreign procurement (whether aid-financed or tax-financed) discourages domestic production and leads to corresponding reductions in agricultural employment and wages. (Urban and formal sector wages were not considered).
8. Some supply-oriented policies can achieve distributional objectives similar to those achieved by extra food imports. But because they must achieve these objectives via reduced market prices, they can do so only if the economy is closed—that is, if the extra supplies do not result in increased exports or reduced imports. Moreover, not all supply-oriented policies benefit the poor. A fertilizer subsidy does increase output supply but tends to erode agricultural employment and wages while supporting farm profits.

PART IV

Implications for Food Policy: Generalizing Beyond Study Countries

23 Some Macroeconomic Policy Implications of Consumer-Oriented Food Subsidies

AMMAR SIAMWALLA

This chapter presents a qualitative analysis of the macroeconomic effect of food subsidies. Other chapters in this book give findings arising out of empirical research. The task here is to provide some typologies so that countries other than those studied can discern the contexts in which questions and problems arise and can utilize the study findings for policy guidance.

A food subsidy involves government intervention in such a manner that food prices to some or all consumers are kept lower than what they would be without it. This intervention usually but not necessarily requires an outlay of funds by the government. Intervention here includes that carried out within domestic markets as well as at the border, that is, through import subsidies and the like. This starting point opens up a number of contentious issues.

If a country pursues food self-sufficiency, banning all food trade with foreign countries but not otherwise intervening in domestic markets, and if the domestic equilibrium price then turns out to be lower than the world price, by this definition, food has been subsidized, albeit implicitly by producers who would otherwise obtain a higher price. (This definition implies the notion of using the world price as a standard, a notion that does not command universal agreement.) If such a country decides to introduce a food subsidy, it would expect the incremental consumption to be met entirely from domestic sources. Unless the subsidy is targeted, there will be a three-way trade-off among the goals of lowering consumer food prices, keeping public expenditures down, and pursuing food self-sufficiency. A self-sufficiency goal cannot be considered independently of the other two goals.

Open food economies may be net food importers or net food exporters. To make the definition of the open food economy symmetrical to that of the closed one, the entire increment in food consumption arising out of the subsidy would be obtained from imports. This distinction based on how the increment is met is of considerable analytical importance

(chapter 22), even though it is somewhat artificial. Most countries would not follow either of these two strategies in a pure form but would meet part of their increased consumption needs from domestic sources and part from imports. Below, analysis of the consequences is carried out for two mythical countries, each of which follows one of the two pure strategies—the presumption being that countries that follow an intermediate strategy will have a consequence between the two.

Another distinction of some analytical importance is that between a permanent and a transitory subsidy. The latter could be a response to a sharp upsurge in world prices or a major domestic crop shortfall that is not expected to last. Again, this distinction is made with the full awareness that in the real world no such sharp line could be drawn and that temporary subsidies have a way of becoming permanent. It is nevertheless an essential distinction, for the consequences will differ depending on whether the subsidies are in fact permanent or transitory, or are perceived to be. The discussion will be focused on a permanent subsidy; the effects of a transitory subsidy are relegated to an addendum.

The term *explicit subsidy* means an outlay of government funds to force consumer food prices lower. The term *implicit subsidy* means that the lower consumer food prices are financed by other sectors of the economy, usually food producers. These definitions and the analysis that follows are substantially independent of the institutional framework in any given country. Whether public enterprises control both foreign and domestic trade in food, whether they control only foreign trade, or whether the private sector handles all foreign and domestic trade subject only to taxation and regulation by the government, does not affect the argument substantially. Of course, institutional arrangements are not completely independent of policy choices and their consequences. For example, if a government embarks on a food subsidy scheme while pursuing a self-sufficiency strategy, then producer prices plus marketing costs may be higher than consumer prices. Such a subsidy is difficult to administer unless the government takes over a substantial part (or even all) of the marketing system. A policy decision, therefore, has an administrative logic that forces the development of an institutional framework.

It follows from the definitions that an explicit food subsidy will redistribute resources between the public and private sectors and that an implicit food subsidy will redistribute resources among private sectors (for example, from food producers to consumers). Both an explicit subsidy financed by increased taxation and an implicit subsidy have second-round effects on the balance of payments and employment. An explicit subsidy using deficit financing may affect capital accumulation, the balance of payments, and the inflation rate.

First-Round Effects of a Food Subsidy Not Deficit Financed

As discussed in chapter 2, a downward shift in the consumer price of food relative to other goods means an increase in real income for food consumers. This burden falls on the treasury or on food producers, depending on several factors.

In a country that pursues food self-sufficiency and that maintains a closed food economy, long-run domestic food production must be brought into balance with the now enhanced domestic consumption. (In the short run, the government could draw down domestic stocks.) The only way this production-consumption balance can be achieved is by giving farmers better returns on growing food. There are several ways to accomplish this: (1) increasing farmers' procurement price relative to the equilibrium price before the intervention so that it exceeds the price consumers now pay; (2) subsidizing inputs such as fertilizers; and (3)—longer-term solution—expanding agricultural research and investing in irrigation. These measures imply an expenditure of public funds, only a part of which benefits food consumers; another part induces farmers to produce more food. Such simultaneous subsidies to consumers and producers were found in several of the countries studied.

On the other hand, in a country that allows foreign trade to play a role in equating production and consumption, the picture is vastly different, particularly if the food subsidy is general and untargeted. In such a case, public resources explicitly subsidize imports. The resulting lower domestic food price represents an implicit tax on producers to finance the increase in consumers' real incomes. This means that, for each dollar of subsidy received by consumers, the expenditure of public funds is less—sometimes considerably less—than in a country pursuing self-sufficiency. When the country is also a food exporter, a general consumer subsidy may allow the government to *increase* its revenues—for example, from an export tax, as in the case of rice in Egypt (chapter 12) and in Thailand (Trairatvorakul, 1984).

If the food subsidy is targeted—for example, through supplies to ration shops, school lunches, and the like—so that producer prices remain unaffected and imports increase by an amount equal to the increase in consumption, then the entire food subsidy would be financed by the government, with producers being unaffected. Consumers then receive the equivalent of an income transfer. Depending on how they spend this extra income (a great deal of which may return to affect the food market, given the high marginal propensity of the poor to consume food), there will be further effects on the different markets.

Effect on Balance of Payments

To analyze the effect of a food subsidy on the balance of payments, the effect on the supply and demand of other goods, particularly of nonfood tradables and of nontradables, needs to be known.[1]

In the closed food economy, resources have to be pulled into the food sector from elsewhere. Typically, this shift is largely at the expense of nonfood agricultural products, which in many countries are mostly destined for export.

In an open food economy, if the subsidy is general (not targeted), there would be an opposite movement: resources would be drawn away from food production. Again, the sector that would be most affected would presumably be export agriculture. One can expect, however, that the foreign exchange earned from increased agricultural exports would be less than that expended on increased food imports, unless the latter is provided on concessional terms, so that the net effect on the supply of tradable goods (that is, on foreign exchange) is still negative. There would also be changes on the demand side as a result of the redistribution of real income among food consumers and producers, depending on the patterns of consumption for each category—in particular, on their marginal propensities to consume nonfood tradables and nontradables. There is some scattered evidence (Hazell and Roell, 1983) that the gainers from a food subsidy (low-income consumers) tend to have a lower marginal propensity to consume nontradable goods than the rest of the population. By implication, then, a transfer of income to these households would tend to increase the demand for tradable goods (primarily food) and therefore would affect the balance of payments adversely.

Assuming a balanced budget, the question arises of how to finance the food subsidy. If it is financed by increased taxation, then the relevant datum is the marginal propensity to consume tradables by the households affected by the taxation. If it is financed by reduced government spending in other areas, then the relevant data are how much of that reduction is in tradables (for example, weapons) and how much in nontradables (for example, civil service employment).

Because of the various possible directions, it is difficult to give more concrete indications on the demand side. There is a slight presumption in favor of increased demand for tradable goods or, equivalently, increased pressure on the balance of payments, largely because the beneficiaries of a food subsidy consume relatively more of these goods. Combining the effects on both supply and demand, it appears more likely that a food subsidy would increase pressure on the balance of payments, regardless of

1. See Corden, 1981, and Dornbusch, 1980, for an exposition of a model with tradables and nontradables used to analyze balance-of-payments problems.

whether the country has an open food economy or a closed one (chapter 4)

Paradoxically, it may well be that a food subsidy in a closed food economy puts greater pressure on the balance of payments than it does in an open food economy (if, for example, food production is highly substitutable with export crop production).

Effect on Demand for Labor

If the presumption is correct that a food subsidy will pressure the balance of payments, sooner or later, adjustments will have to be made. They may take the form of a currency devaluation, increased protection of import-competing goods (other than food), or an export subsidy. Each of these options would then lead to a resource reallocation within the tradable goods sector and between this sector and the nontradable goods sector, as shown for Egypt (chapter 13). The effect on the demand for labor would vary according to how labor intensive each of the sectors rewarded or penalized is. One would expect that the nontradable sector would find relative prices moving against it, and because it is presumably the most labor-intensive sector, this would reduce the total demand for labor, perhaps significantly. Wages relative to tradable goods other than food would decline.

How one regards such a development depends on how one views the economic structure as a whole. If one supposes labor markets to work perfectly without any friction, then such a movement is clearly against the workers' interest. If, on the other hand, the nontradable sector includes a large subsector that is a repository of workers who cannot find jobs in the formal sectors and who are now eking out a living in jobs of low to marginal productivity, such as street vendors, messenger boys, and the like, then the expansion of some of the tradable sectors as a result of the adjustment process will presumably draw labor from this pool. As labor moves from these jobs to high marginal productivity jobs, there will be further income effects in balance of payments and employment.

A Food Subsidy Financed by a Budget Deficit

In both open and closed food economies, if the food subsidy imposes a burden on the government's budget to such an extent that a deficit is incurred, the burden of financing the subsidy may be shifted to capital markets. Offhand, one would then expect interest rates to go up, a conclusion that must be modified by other considerations. First, the saving rate may increase owing to the subsidy-induced redistribution of income. Second, foreign credit may be available to finance the budget deficit. This may not be an explicit loan to finance the subsidy or the budget deficit but may be a general balance-of-payments support—for where domestic interest rates

are regulated, the most immediate consequence of a budget deficit is a balance-of-payments deficit. And third, a Keynesian expansion may occur if there was insufficient aggregate demand in the economy prior to the budget deficit. The consequence of these caveats, either singly or in combination, is unclear. If the Keynesian model is rejected as having little relevance to developing countries and if it is presumed that a food subsidy tends to raise real interest rates and lower capital accumulation, the first two effects described above will only moderate the increase in the interest rate and the reduction in investment.

If the budget deficit is financed by monetary expansion, the sequence of events is more complicated. Monetary expansion, especially if it is large, will cause a strain on the current-account balance of payments, which will sooner or later have to be followed by a nominal exchange rate adjustment and a general increase in prices. Consequently, in the earlier stages, the deficit is financed by foreign credit and a reduction of foreign exchange reserves, followed in the later stages by an inflation tax on cash balances, as currency depreciation causes the general price level to rise.

There are two real consequences of this continual expansion in the money supply. First, where the food subsidy is used to peg nominal consumer prices of food at certain levels—and if there is political resistance to revising these nominal prices such as in Egypt (chapter 13)—inflation of all other prices would mean that real food prices would continually go down and that the subsidy would continually increase, even in real terms. Alternatively, where a fixed fund has been set aside to finance the subsidy—for example, the current food stamp program in Sri Lanka (chapter 18)—inflation would erode it, and therefore the real subsidy would continually decrease.

Second, inflation tends to reduce the incentive to hold real money balances. Although it is possible that the reduction in real cash balances may lead to attempts to increase holdings of real physical capital, recent views held by at least some economists have been that, especially in developing countries, the inflation penalty on holding real cash balances exerts a negative influence on the proper functioning of capital markets and may thus reduce capital accumulation.

A Transitory Food Subsidy

A transitory subsidy is sometimes necessary, either because of a temporary upward movement in the world prices of food commodities (relevant mostly for open food economies) or because of a temporary shortfall of domestic production coupled with low stocks in a hitherto closed food economy. In either case, the typical outcome is for the government to subsidize food imports in order to pull down domestic prices. The only excep-

tions are the atypical cases, when domestic consumer prices of food in a closed food economy are high relative to world prices to begin with, or when the country is a food exporter, in which case the government may reap some extra tax revenues.

Typically, an increase in the food import bill is inevitable. Even when the government subsidy is fully met by increased taxation or a cut in other expenditures (except where such cuts are on tradable goods), there is a presumption in favor of increased pressure on the tradable goods market (balance of payments). Where the problem originates in a harvest failure, it is likely to be accentuated by a fall in tradable goods as a whole (export crops as well as food). This pressure would, in a fixed exchange rate system (with discretely adjustable pegs), imply a drain of foreign exchange.

What does this drain of foreign exchange do to the domestic economy? Clearly, if the government has sufficient foreign exchange and decides to use it to cope with this temporary requirement, it can do so without any major effect on the economy in the first instance. After all, that is precisely the reason for foreign exchange reserves. Similarly, if the country has a sufficient credit line with foreign lenders, it can borrow from them to finance this presumably temporary surge in imports without any major immediate effect on the economy. It is to lessen the pains of adjustment that the International Monetary Fund has opened its various windows, such as the Compensatory Financing Facility and the Food Facility.

The use of these reserves and credit lines would, of course, cause the net asset (or liability) position of the country to deteriorate. If that deterioration is significant and imposes a drain on the flow of foreign exchange to service the increased debt, or if there is a need to replenish the reserves, then a downward adjustment in the exchange rate would be called for; or other balance-of-payments adjustments—such as increased restrictions on imports through quotas, tariffs, or export subsidies—may be undertaken. There would then be changes in employment and in domestic relative prices between tradables and nontradables.

If a country's foreign reserves or its capacity to borrow are exhausted, intertemporal smoothing of adjustments may not be available, but even here some lessening of the immediate pains may be attempted. In most developing countries, capital goods form a large fraction of the total import bill, providing some leeway for replacing these imports temporarily with food imports. This is precisely what Egypt did (Scobie, 1983). The effect of such an action is simply to defer the country's development.

When even this avenue is closed, a painful adjustment, probably requiring an immediate exchange rate adjustment, would be necessary, with the consequences on the domestic inflation rate and employment already described. In this particular instance, the adjustment would be more acutely felt than where some smoothing process is permitted.

Conclusions

To predict the effect of a permanent food subsidy, the following questions have to be answered. First, is the food subsidy in a closed food economy or an open food economy? Is the subsidy open to all consumers, or is it targeted? Is it financed by taxation, by reduced expenditures, by borrowing, or by monetary expansion? If by taxation, which population group is most affected, and what are their consumption patterns? If through reductions, are cuts being made in traded or nontraded goods?

In most instances, if a permanent food subsidy is a major budget item, there will be some pressure on the balance of payments and, consequently, on exchange rates. Its effect on aggregate employment in a full-employment model depends considerably on the labor intensities of the penalized sectors. If the economy is in the midst of Keynesian unemployment, the effect of the subsidy is likely to be expansionary.

The costs of a temporary subsidy depend on how much room to maneuver the country has in capital markets. Adjustment processes in order of increasing severity are allowing foreign exchange reserves to decline, borrowing abroad, deferring imports of capital goods, and devaluation.

24 Some Microeconomic Policy Implications of Consumer-Oriented Food Subsidies

PER PINSTRUP-ANDERSEN

Some of the most important macroeconomic policy implications derived from the studies and policy experience reported in this book were discussed in chapter 23. This chapter attempts to summarize the microeconomic policy implications, with emphasis on lessons useful for the choice, design, modifications, and implementation of future food policy measures, including food subsidies.

Worldwide recession plus severe foreign exchange problems in many developing countries, along with high fiscal costs of explicit subsidies and large economic costs of price distortions to producers, are putting pressure on governments to reduce or eliminate consumer-oriented food subsidies. However, many subsidies have significantly increased the purchasing power of the poor and have reduced the risk of food shortages and price fluctuations for poor households. Attempts to eliminate subsidies could result in severe hardships and are likely to be met with strong resistance. Such resistance is amplified because the economic costs of food subsidies and other price distortions—and thus the potential gains from eliminating them—are generally not fully perceived by the general population. Furthermore, the gains from removing the subsidies may not accrue to those who benefit from the subsidies.

The long-run net effect of food price subsidies on incomes of wage earners is less than the income transfer embodied in the subsidies, because wages tend to adjust to changing food prices. This is particularly pronounced in cases where minimum wage laws or labor unions are able to maintain at least a certain degree of indexing between prices and wages. Thus at least part of the transfer is passed on to other sectors of the economy. This implies that government savings from reduced food subsidies would be partly offset by increasing public sector wages. This occurred in Sri Lanka and would be likely to occur in Bangladesh, Egypt, and probably most other countries. In some countries, food subsidies are in fact

viewed as partial wages to public sector employees, including military personnel, and may be designed with this in mind.

Government savings from reducing or removing explicit food subsidies may also be less than expected, because a large share of the subsidy cost is borne by donors of foreign food aid. In fact, some food subsidy programs based on foreign food aid have resulted in net gains to governments, as shown by Ahmed for Bangladesh (chapter 15), thus providing a source of government revenue that would disappear if both food aid and subsidies were discontinued. If on the other hand foreign food aid is maintained and subsidies are discontinued, domestic food demand will decrease, and strong downward pressures on domestic agricultural prices and associated increases in economic costs are likely to result unless commercial imports are reduced.

As illustrated by the above discussion, an assessment of the benefits and costs of consumer food subsidies is not straightforward and should be undertaken within the socioeconomic and political context of which they are part. While ideological convictions may lead to sweeping generalizations as to whether food subsidies are good or bad, such generalizations are of little value in pragmatic policymaking, because they ignore political realities and potential economic trade-offs among policy measures.

One of the key lessons learned from the research and policy experience reported here is that consumer food subsidies may be appropriate and cost-effective components of government policies to achieve growth and equity goals—or they may be inappropriate and cost ineffective. They clearly have a role to play for some countries during some periods in efforts to reach social, economic, and political objectives. However, in many cases this role has not been properly specified, and failure to design or modify subsidy programs to achieve the objectives in the most cost-effective manner and failure to discontinue or replace inappropriate programs have resulted in high fiscal and economic costs and misallocations of resources and transfers. Correcting inefficiencies in program design and implementation offer opportunities for reducing costs and increasing benefits to intended beneficiaries, thus improving overall cost effectiveness. Similarly, introducing appropriately designed subsidy programs when they offer the best option for achieving certain goals—for example, short-term compensation to population groups that lose from macroeconomic adjustments—could greatly improve the cost effectiveness of the overall policy package. The challenge is to identify conditions in which consumer food subsidies are appropriate policy measures and to improve their cost effectiveness.

When Are Consumer Food Subsidies Appropriate?

Consumer food subsidies are rarely, if ever, the most efficient measure to deal with long-term structural problems in the economy. On the contrary, they may contribute to such problems. Their proper role is to compensate for the effects of inappropriate development strategies, institutional changes, and policy measures. Thus the need for consumer food subsidies to enhance the purchasing power of the poor and to lower food prices should be decreased by a development strategy that emphasizes employment generation among the poor, by cost-saving technological change in food production, by investments in rural infrastructure, and by improvements in food marketing. Such institutional improvements may also reduce fluctuations in food prices and food availability. Last but not least, institutional changes and policy measures that provide the poor access to productive assets and skills could greatly reduce the need to enhance their incomes through food subsidies.

However, in societies where the development strategy is biased toward capital-intensive urban development rather than employment-intensive rural development, where too little emphasis is placed on expanding food production at lower unit costs and on reducing food marketing costs, where marketing institutions are not effective in dealing with price fluctuations, or where the poor do not have effective access to sufficient productive resources to assure a minimum living standard, consumer food subsidies may have an important role. Food subsidies frequently exist amidst other distortions in capital and product markets, including explicit subsidies on energy, transportation (mass transit as well as national airlines), telephones, and other goods and services. In such cases, it is not clear that priority should be placed on reducing or eliminating food subsidies over other distortions. In fact, food subsidies may be needed to compensate the poor for negative effects of regressive distortions.

Based on the evidence presented in this book, it may be concluded that consumer food subsidies, if properly designed and implemented, may be very effective in reducing the insecurity of access to food at the household level by making fixed rations available at predetermined prices. They may also be very effective in enhancing the short-run purchasing power of the poor. Whether this is achieved in a cost-effective manner depends on the design and implementation of the program. Furthermore, although few subsidy programs have attempted to create or enhance the income-generating ability of the poor in a self-sustained manner, such opportunities clearly exist if the programs are designed and implemented accordingly. Finally, the appropriateness of consumer food subsidies should be assessed in the light of other types of programs. Relative cost effectiveness

offers an effective indicator for program choice as well as the most appropriate design and implementation of consumer food subsidies. Ways of assuring high cost-effectiveness are discussed in the next section.

Improving the Cost Effectiveness of Food Subsidies

Program Design and Implementation

The magnitudes of benefits and costs, the way they are distributed, and the extent to which goals are met vary among programs and are influenced by program design and implementation. Modifications of existing programs may improve their performance. However, for such modifications to be successful, program goals must be clearly specified. Pursuing rationing or price stabilization goals efficiently may require programs that are different from those needed to assure efficient income transfers. Similarly, if the goal is to improve nutrition rather than to transfer income, the most cost-effective program design may be different.

Many existing programs and policies have changed over time, from being primarily public distribution schemes aimed at assuring households access to certain rations of basic staples at fixed prices to much more costly food-linked income transfer programs. In some cases, the transition has been by default rather through a change in policy goals and has been caused by an inability to increase the prices of food rations at the same rate as the price increases in the open market.

Targeting

Household targeting is a key element in achieving income transfer or nutrition goals at reduced costs. Although targeting conflicts with rationing goals if these are interpreted to include all households, targeting is compatible with rationing goals that include only the poor. Modifications in food subsidy programs toward targeting would be likely to reduce fiscal and economic costs, but they would also result in economic losses for nontarget households and therefore incur political opposition. The design and implementation of programs to reach target households and to exclude nontarget households are extremely difficult. The difficulties are due to political and logistical factors as well as to insufficient information. Nontarget households will oppose successful targeting, in some cases to the point of threatening political and social stability. Furthermore, administrative costs of operating subsidy and transfer programs increase with increasing targeting. This is of particular concern in those developing countries where trained manpower is scarce.

Thus for the above reasons, perfect targeting should not be attempted. There is a point beyond which increases in administrative costs, including the cost of identification of target households, exceed the savings

from further reducing benefit leakage to nontarget households. Furthermore, as a program gets more narrowly targeted, the risk of excluding target households increases due to insufficient information. Finally, a program narrowly targeted on the poor is likely to have little political support in all but the most enlightened societies and—if implemented—may have a short life, as exemplified by the Colombian food stamp program.

Ideally, household targeting would be based on incomes of households adjusted for size and composition. However, reliable estimates of household incomes are not usually available, and efforts to obtain and periodically update such estimates would be extremely expensive and often impossible. Furthermore, households may move in and out of poverty or may need support only during certain periods. Therefore, flexibility as well as an exit criterion may be needed. Nevertheless, income and assets may be used to exclude the highest income groups.

As further elaborated in chapter 8, a larger number of other targeting mechanisms have been tried, some with success and others not. These include geographical targeting, targeting by the nutritional status of household members or by employment status, targeting by subsidizing inferior commodities or inferior qualities, and targeting in certain periods of the year where seasonal fluctuations severely limit the ability to acquire sufficient food. The most appropriate choice among the various targeting approaches depends on the particular circumstances within which subsidies are introduced. As a general rule, however, targeting approaches that contradict household behavior the least—for example, subsidies on less preferred foods—are most likely to be successful. Lack of success in targeting or high costs of targeting are frequently due to the desire and ability of nontarget households to circumvent targeting efforts. Removing their desire to do so would cut targeting costs.

In some cases, targeting may result in a stigma on certain population groups. This may lead to societal divisions and social and political instability, particularly if the target group tends to belong primarily to a distinct ethnic group.

Governments may consider targeting subsidy costs as an alternative to targeting subsidy benefits. The generation of revenues to cover subsidy costs through excise taxes on luxury goods and services is one example of such an approach; progressive income taxes is another. However, it is not clear that targeting costs is easier than targeting benefits.

The cost of implicit food subsidies are usually targeted on producers. While, as discussed in chapter 6, efforts to maintain consumer subsidies through artificially low producer prices may entail high economic costs, selective procurement need not. Government procurement of food from farmers at prices below free-market prices need not reduce incomes to the producer sector if the lower prices are passed on to low-income consumers

in the form of a highly targeted food price subsidy and if the procured quantity is a small part of the quantity produced by a particular farmer. This is so because the scheme will result in an overall demand increase and in compensation to producers through higher prices for the quantity sold in the free market.

If such procurement is limited to large producers, small ones would benefit from the price increases without having to contribute to the cost of the subsidies. In the absence of changes in foreign trade of the commodity, the net result would be a transfer from high-income (nontarget) consumers to low-income (target) consumers and small producers. Whether large producers would lose or gain would depend on the price response among consumers and producers. Studies of the Indian procurement scheme for foodgrains (chapter 16; Mellor, 1968; Dantwala, 1967, 1981; Hayami, Subbarao, and Otsuka, 1982, and George, 1985) indicate that producers as well as low-income consumers may gain, at least in the short run, and that significant improvements in income distribution may be obtained with only small losses in economic efficiency if the subsidy scheme is effectively targeted on the poor rather than on most urban consumers, as is currently the case.

Distribution

Results from the work reported in this book indicate that private sector distribution of subsidized food can be very cost effective, often more than public distribution. Food stamps that may be redeemed in private stores are an obvious example. Even when the subsidy is embodied in a lower price for a certain commodity ration, it is unlikely that a separate public distribution network can operate at a lower cost or a lower degree of corruption and program abuse. Private distribution has been successfully used in a number of countries, including the Philippines and Egypt, at a relatively low cost. Household food security goals may not be fully achieved through private distribution in countries where a strong competitive market is absent or where the risk of political or social instability is high, but in most countries, investing in marketing infrastructure and activities to improve competition among marketing agents appears to be a more efficient strategy than maintaining a public sector food distribution network. Promoting small-scale private sector retailing, improving transportation, and investing in other private sector marketing activities are particularly promising because, in addition to being cost effective and reducing concentration of food marketing in the hands of a few, such a strategy will accelerate entrepreneurship and income generation among the poor.

Program Choice

The cost effectiveness of food subsidy programs may also be improved by a careful choice of program type. The two most common types are food

stamps and price subsidies for specific rations or for unlimited quantities. The transfer effects of price subsidies for inframarginal rations would not be expected to differ greatly from food stamps for a given household. However, the degree to which rationing goals are achieved may vary greatly between the two program types. The critical issue is whether the household is assured a certain physical quantity at a fixed price or a certain monetary transfer. In the former, recipient households are assured a constant transfer in real terms, whereas in the latter, price fluctuations and increases in open-market prices may erode the real purchasing power of the transfer (but will reduce real fiscal costs), as illustrated by the food stamp program in Sri Lanka. In theory, the difference between the two programs could be eliminated if the ration price or the nominal value of food stamps was increased as fast as the open-market price. However, inaction by the government would result in increasing fiscal costs and constant or increasing benefits to the recipients of the ration price but decreasing benefits and fiscal costs for food stamps users.

The issue of appropriate adjustments in subsidized food prices and the effect on rationing and income transfers is particularly important during periods of devaluation of the local currency or of rapid food price increases in the international market. Maintaining fixed nominal prices for food staples in the face of devaluation and rapidly increasing domestic prices may result in large and unsustainable increases in the cost of food subsidies. On the other hand, if sharp increases in domestic prices are fully reflected in the price of basic staples, the poor may experience hardships that are economically and politically unsustainable. Social unrest caused at least in part by increasing food prices in a number of countries during the recent past illustrates this point.

Recent efforts to solve foreign debt and deficit-spending problems have included devaluation, higher agricultural prices, and reductions in spending on food subsidies and social programs in a number of countries. In some cases, it appears that the poor have borne a disproportionally large share of the burden of economic adjustment. Although these measures may be necessary to solve immediate foreign exchange problems and may result in accelerated long-term economic growth and employment, short-term implications for the poor may be such that compensatory measures are needed. Targeted food subsidies may be a cost-effective means for providing such compensation. Before such measures are designed, it is important to clarify which consumer groups the government wishes to compensate and whether such compensation will meet the stated goals.

Food price subsidies are but one of many ways in which governments may increase the purchasing power of the poor and compensate for losses in real incomes caused by needed adjustments or by an inappropriate development strategy. Tied or untied cash transfers as well as food transfers are available policy measures. Untied cash transfers tend to be less palat-

able politically than transfers linked to food, such as food stamps, targeted food price subsidies, and food supplementation schemes. Political resistance to programs directly aimed at a reduction in starvation and malnutrition is likely to be much less severe than political resistance to cash transfers, even when the former results in transfer of real income that is partially or fully fungible, such as most food stamp programs. Cash transfer programs are also very difficult to implement, and the cost of the necessary control measures to avoid fraud and excessive leakage to nontarget groups is likely to be high. Self-targeting, which may be possible if food subsidies are aimed at less desired foods, is not possible for cash transfers. Another argument that favors food transfers over cash transfers is that food subsidy and direct feeding schemes reduce food prices relative to other commodity prices and thus contribute to a substitution of food for nonfoods, which would not occur as a result of a direct income transfer. This argument holds true only if food becomes cheaper at the margin.

There is some evidence that the marginal propensity to consume food is higher for real incomes originating from food subsidy programs or direct feeding schemes than from cash transfers. The reason is probably to be found in differing preferences of household members and the relation between source of income and household budget control.

Finally, in comparing cash and food transfer schemes, it should be recognized that food may be available from foreign aid at a cost to governments considerably below its market value, thus making food-related transfer less expensive. In some cases such food aid can be monetized by the recipient governments, while in many others, donor restrictions prohibit monetization.

In attempts to reduce leakages to nontarget households and to focus more sharply on improved nutrition, some countries have opted for food supplements or direct feeding of individuals deficient in calories and protein, usually children and pregnant and lactating women. School lunch programs and feeding of preschool children in health and nutrition clinics are examples of direct feeding. Such programs may assure that leakages to nontargeted households are small. However, intrahousehold leakages will occur through reductions in the allocation of food to target individuals. Furthermore, households may reduce food acquisition from other sources.

If nutritional improvement is the sole goal of a food subsidy program, its cost effectiveness is likely to be highest if combined with an integrated primary health care program, which may include growth monitoring, nutrition education, vaccinations, and various preventive and curative health measures. Malnutrition is likely to be caused by a set of factors, only some of which will be affected by a food subsidy per se. Therefore, since the effect of changing one factor—for example, purchasing power—depends on changing other factors—for example, anorexia caused by diarrhea, or

low budget allocation to food due to poor nutrition knowledge—a combined program is likely to be more cost effective than a food subsidy program per se. Such an approach may also be used to identify target households through, for example, growth monitoring at the health center or in the homes.

An integrated approach implies a risk of overloading the primary health care system. Therefore, it is important that a sufficient addition be made to the resources available to the system. Furthermore, private retailers rather than the primary health care system should be charged with distribution of the subsidized food. This may be implemented by distributing food stamps to target households at health centers. More detailed discussions of alternatives to consumer food subsidies are presented in chapter 9 and in Pinstrup-Andersen (1987).

Concluding Remarks

Subsidies are, of course, only one means of keeping food prices low to the consumer. Improvements in the efficiency of food production through technological change, improved rural infrastructure, and expanded input use, as well as improved marketing efficiency, offer great opportunities for reduced consumer prices without adverse effects on producers and without large government outlays. Enhanced capacity of the poor to generate sufficient incomes to meet nutritional requirements and other demands provide the long-term means to meet welfare goals. Consumer food subsidies or alternative transfer programs should be viewed as temporary but important means to assure that the poor are able to acquire sufficient food to meet nutritional requirements while such capacity is being created.

Opportunities for using food subsidies to create self-sustained income-generating capacity among the poor have not been fully exploited and should be pursued. Such opportunities include the formation of human capital through improved health, nutrition, and education, as well as the use of subsidized food to facilitate the development of small-scale enterprises and other self-help activities by the large portion of the poor who are self-employed. Public work schemes offer promise in this regard. Furthermore, access to food subsidies along with credit and technical assistance during the initial phases of new private sector activities may greatly facilitate and expand small-scale entrepreneurship, increase incomes among the poor, and reduce the needs for food subsidies in the future. Furthermore, food subsidies may be effectively used to support community efforts to create the infrastructure needed to support local economic development. Ideally, the poor would gain first from participating through public works programs that generate infrastructure and, subsequently, through increased employment and new opportunities for small-scale en-

trepreneurship made possible by the newly created infrastructure. These relations are discussed in chapter 10.

In conclusion, the most important lesson learned from the research and policy experience presented in this book is that consumer food subsidies can be a powerful and cost-effective policy tool to reach certain social, economic, and political goals, or they can be harmful to growth and equity. As with so many other policy tools, the question is not whether consumer food subsidies are good or bad but when and how they are applied.

References and Bibliography

Abbott, P. C. 1979. "Modelling International Grain Trade with Government Controlled Markets." *American Journal of Agricultural Economics* 61:22-31.

Agarwala, R. 1983. *Price Distortions and Growth in Developing Countries.* Staff Working Paper 575. Washington, D.C.: World Bank.

Ahmed, J. U.; Rahman, M. L.; and Huq, A. F. M. F. 1980. *Paddy-Rice Procurement System in Bangladesh.* Dhaka: Bangladesh Ministry of Agriculture and Forests.

Ahmed, Raisuddin. 1978. "Price Support versus Fertilizer Subsidy for Increasing Rice Production in Bangladesh." *Bangladesh Development Studies* 6:119-38.

———. 1979. *Foodgrain Supply, Distribution, and Consumption Policies Within a Dual Pricing Mechanism: A Case Study of Bangladesh.* Research Report 8. Washington, D.C.: International Food Policy Research Institute.

———. 1981. *Agricultural Price Policies Under Complex Socioeconomic and Natural Constraints: The Cast of Bangladesh.* Research Report 27. Washington, D.C.: International Food Policy Research Institute.

———. 1988. "Pricing Principles and Public Intervention in Domestic Markets." In *Agricultural Price Policy for Developing Countries,* ed. John W. Mellor and Raisuddin Ahmed. Baltimore: Johns Hopkins University Press.

Ahmed, S. 1984. *Public Finance in Egypt: Its Structure and Trends.* Staff Working Paper 639. Washington, D.C.: World Bank.

Alderman, Harold. 1986. *The Effect of Food Price and Income Changes on the Acquisition of Food by Low-Income Households.* Washington, D.C.: International Food Policy Research Institute.

Alderman, Harold, and Timmer, C. Peter. 1980. "Consumption Parameters for Sri Lanka Food Policy Analysis." *Journal of Agrarian Studies* 1:1-12.

Alderman, Harold, and von Braun, Joachim. 1984. *The Effects of the Egyptian Food Ration and Subsidy System on Income Distribution and Welfare.* Research Report 45. Washington, D.C.: International Food Policy Research Institute.

———. 1986. "Egypt's Food Subsidy Policy: Lessons and Options." *Food Policy,* August: 223-37.

Aiderman, Harold; von Braun, Joachim; and Sakr, Sakr Ahmed. 1982. *Egypt's Food Subsidy and Rationing System: A Description.* Research Report 34. Washington, D.C.: International Food Policy Research Institute.

Amranand, Piyasvasti, and Grais, Wafik. 1984. *Macroeconomic and Distributional Implications of Sectoral Policy Interventions: An Application to Thailand.* Staff Working Paper 627. Washington, D.C.: World Bank.

Anderson, M. A., et al. 1981. *Supplementary Feeding. Study I of Nutrition Intervention in Developing Countries,* ed. J. E. Austin and M. F. Zeitlin. Cambridge, Mass.: Oelgeschlager, Gunn, and Hain.

Antle, J. M., and Aitah, A. S. 1983. "Rice Technology, Farmer Rationality, and Agricultural Price Policy in Egypt." *American Journal of Agricultural Economics* 65:667–74.

Austin, J., and Cassus, C. 1975. *CONASUPO.* Case 375-357. Cambridge, Mass.: Harvard Business School and School of Public Health.

Axelrod, Robert. 1970. *Conflict of Interest.* Chicago: Markham.

Baker, Raymond. 1978. *Egypt's Uncertain Revolution under Nasser and Sadat.* Cambridge, Mass.: Harvard University Press.

Baldwin, Robert E. 1966. *Economic Development and Export Growth.* Berkeley and Los Angeles: University of California Press.

Bale, M. D., and Lutz, E. 1979. "The Effects of Trade Intervention on International Price Instability." *American Journal of Agricultural Economics* 61:512–16.

———. 1981. "Price Distortions in Agriculture and Their Effects: An International Comparison." *American Journal of Agricultural Economics* 67:8–22.

Banco do Brasil. 1979. *Trigo Nacional.* Porto Alegre: Banco do Brasil, Departamento de Comercializacao do Trigo Nacional.

Banco Central do Brasil. 1982. "Relatorio 1982." *Brasilia* 19:1–148.

Bangladesh. 1981, 1984. *Statistical Yearbook.* Dhaka: Ministry of Finance and Planning, Bureau of Statistics.

Bardhan, K. 1975. "Problems Related to Distribution of Foodgrains." Discussion paper. Indian Council of Social Science Research.

Barker, R., and Hayami, Y. 1976. "Price Support versus Input Subsidy for Food Self-Sufficiency in Developing Countries." *American Journal of Agricultural Economics* 58:617–28.

Barkin, D., and Esteva, G. 1981. *El Papel del Sector Público en la Comercialización y Fijación de Precios de los Productos Agrícolas.* Mexico City: Comisión Economica para América Latina el Caribe.

Barzel, Yoram. 1974. "A Theory of Rationing by Waiting." *Journal of Law and Economics* 17:73–95.

Bates, Robert. 1981. *Market and States in Tropical Africa.* Berkeley and Los Angeles: University of California Press.

Bautista, Romeo. 1978. "Import Demand in a Small Country with Trade Restrictions." *Oxford Economic Papers* 30:199–216.

Beaton, George. 1982. "Evaluation of Nutrition Interventions: Methodological Consideration." *American Journal of Clinical Nutrition* 35:1280–89.

———. 1983. "Energy in Human Nutrition: Perspectives and Problems." *Nutrition Review* 41:325–40.

Beaton, George, and Ghassemi, Hossein. 1979. *Supplemental Feeding Program for Young Children in Developing Countries*. New York: United Nations Children's Fund.

———. 1982. "Supplementary Feeding Programs for Young Children in Developing Countries." *American Journal of Clinical Nutrition* 34 (supplement): 864-916.

Benus, J.; Kmenta, J.; and Shapiro, H. 1976. "The Dynamics of Household Budget Allocation to Food Expenditures." *Review of Economics and Statistics* 58:129-38.

Berg, Alan. 1981. *Malnourished People: A Policy View*. Poverty and Basic Needs Series. Washington, D.C.: World Bank.

Berlage, L. J. J. B. 1972. "Food Demand Supply Policies in Bangladesh." Ph.D. diss., Massachusetts Institute of Technology.

Bertrand, Trent. 1980. *Thailand: Case Study of Agricultural Input and Output Pricing*. Staff Working Paper 385. Washington, D.C.: World Bank.

Bethlen, F. R. 1962. "Effects of Brazilian Economic Development and Price Policies on Brazil Wheat Imports." Ph.D. diss., Purdue University.

Bhagwati, J. 1978. *Foreign Trade Regimes and Economic Development: Anatomy and Consequences of Exchange Control Regimes*. Vol. 11, Special Conference Series on Foreign Trade Regimes and Economic Development. New York: National Bureau of Economic Research.

BIDS/IFPRI. 1983. "Characteristics and Short-Run Effects of the WFP-Aided Food-for-Work Programme in Bangladesh." Rome: BIDS/IFPRI.

———. 1985. "Development Impacts of the Food-for-Work Programme in Bangladesh." Rome: BIDS/IFPRI.

Bienen, Henry S., and Gersovitz, Mark. 1984. *Consumer Subsidy Costs, Violence, and Political Stability*. Princeton, N.J.: Princeton University Press.

Bigman, David. 1980. "National Food Policies in Developing Countries: The Experience and the Lesson." Hebrew University of Jerusalem.

Bigman, David, and Reutlinger, Shlomo. 1979. "Food Price and Supply Stabilization: National Buffer Stocks and Trade Policies." *American Journal of Agricultural Economics* 61:657-67.

Binswanger, Hans, and Rosenzweig, Mark. 1984. "Contractual Arrangements, Employment and Wages in Rural Labor Markets: A Critical Review." In *Contractual Arrangements, Employment and Wages in Rural Labor Markets in Asia*, ed. Hans Binswanger and Mark Rosenzweig. New Haven, Conn.: Yale University Press.

Black, S. W. 1976. *Exchange Rate Policies for LDCs in a World of Floating Exchange Rates*. Essay in International Finance 119. Princeton, N.J.: Princeton University Press.

Blejer, M. I. 1979. "Devaluation, Inflation, and the Balance of Payments: A Short-Run Monetary Approach." *Economic Record* 55:33-40.

Bouis, Howarth. 1982. "Rice Policy in the Philippines." Ph.D. diss., Stanford University.

Boutros-Ghali, Y., and Taylor, Lance. 1980. "Basic Needs Macroeconomics: It Is Manageable in the Case of Egypt." *Journal of Policy Modeling* 2:407-36.

Braverman, A.; Ahn, C. H.; and Hammer, J. S. 1983. *Alternative Agricultural Pricing Policies in the Republic of Korea: Their Implications for Government Deficits, Income Distribution, and Balance of Payments.* Staff Working Paper 621. Washington, D.C.: World Bank.

Brown, G. T. 1978. "Agricultural Pricing Policies in Developing Countries." In *Distortions of Agricultural Incentives*, ed. T. W. Schultz. Bloomington: Indiana University Press.

Brunner, Ronald, and Brewer, Garry. 1971. *Organized Complexity.* New York: Free Press.

Bruton, H. J. 1981. *Egypt's Development in the Seventies.* Research Memorandum 84. Williamstown, Mass.: Williams College, Center for Development Economics.

Byerlee, D. 1983. *The Increasing Role of Wheat Consumption and Imports in the Developing World.* Economics Program Working Paper 05/83. Mexico: Centro Internacional de Mejoramiento de Maiz y Trigo.

Calegar, Geraldo M. 1984. "Brazilian Wheat Policy and Its Income Distribution and Trade Effects: A Case Study." Ph.D. diss., University of Minnesota.

Cardoso, E. A. 1981. "Food Supply and Inflation." *Journal of Development Economics* 8:269-84.

Carloni, Alice S. 1981. "Sex Disparities in the Distribution of Food Within Rural Households." *Food and Nutrition Bulletin* 7:3-12.

Carr, D. W. 1979. *Foreign Investment and Development in Egypt.* New York: Praeger.

Carvalho, L. E. 1981. "O Caracter Social da Politica de Subsidio ao Trigo." *Alimentacao e Nutricao* 2:32-42.

Cavallo, Domingo, and Mundlak, Yair. 1982. *Agriculture and Economic Growth in an Open Economy: The Case of Argentina.* Research Report 36. Washington, D.C.: International Food Policy Research Institute.

CCRP (Regional Center for Population Research). 1980. *Encuesta de Diagnostico Nutricional PAN 1979* (Nutritional Diagnosis Survey for the National Food and Nutrition Plan, PAN, 1979). Final Report. Bogota: CCRP.

Central Bank of Ceylon. Annual. *Report on Consumer Finances and Socioeconomic Survey.* Colombo: Central Bank of Ceylon.

CEPAL. 1982. *Economia Campesina y Agricultura Empresarial.* Siglo 21. Mexico City: Comision Economica para América Latina el Caribe.

Chen, L.; Huq, E.; and D'Souza, S. 1980. "Sex Bias in the Family Allocation of Food and Health Care in Rural Bangladesh." *Population and Development Review* 7:61-63.

Chichilnisky, G., and Taylor, Lance. 1980. "Agriculture and the Rest of the Economy: Macro Connections and Policy Constraints." *American Journal of Agricultural Economics* 62:303-09.

Chopra, R. N. 1981. *Evolution of Food Policy in India.* Delhi: Macmillan.

Choueri, N., and Eckaus, R. S. 1979. "Interaction of Economic and Political Change: The Egyptian Case." *World Development* 7:783-97.

Colombia. 1972. *Bases para una Politica de Alimentacion y Nutricion en Colombia* (Foundations for Food and Nutrition Policies in Colombia). Bogota: Department of National Planning.

———. 1975a. *El Plan de Alimentacion y Nutricion* (The National Food and Nutrition Plan). Bogota: Department of National Planning.

———. 1975b. *Para Cerrar la Brecha (Plan de Desarrollo Economico y Social 1975-1978)* (To Close the Gap [Social and Economic Development Plan 1975-1978]). Bogota: Department of National Planning.

———. 1982. *Programa de Boletos: Una Revision del Valor Inicial del Subsidio* (Food Stamp Program: A Revision of the Initial Subsidy Level). Bogota: Department of National Planning, Integrated Rural Development Program, National Food and Nutrition Plan.

———. 1983. *Bases para la Reorientacion Institucional del Programa DRI-PAN* (Foundations for the Institutional Reorientation of the DRI-PAN Program). Bogota: Department of National Planning, Integrated Rural Development Program, National Food and Nutrition Plan.

Connally, M., and da Silveira, J. D. 1979. "Exchange Market Pressure in Post-War Brazil: An Application of the Girton-Roper Model." *American Economic Review* 69:448-54.

Contador, C. R. 1974. "Trigo Nacional: O Custo Social da Auto Suficiencia." *Estudos Economicos* 4:53-83.

Corden, W. M. 1981. *Inflation, Exchange Rates, and the World Economy.* Chicago: University of Chicago Press.

Cornelisse, Peter, and Naqvi, S. N. H. 1984. *The Anatomy of the Wheat Market in Pakistan.* Rotterdam: Erasmus University, Center for Development Planning.

Cornia, Giovanni Andrea; Jolly, Richard; and Stewart, Frances, eds. 1987. *Adjustment with a Human Face: Protecting the Vulnerable and Promoting Growth.* Vol. 1. Oxford: Oxford University Press.

Cummings, John T. 1974. "The Supply Responsiveness of Bangalee Rice and Cash Crop Cultivators." *Bangladesh Development Studies* 2:857-66.

Dantwala, M. L. 1967. "Incentives and Disincentives in Indian Agriculture." *Indian Journal of Agricultural Economics* 22:1-25.

———. 1981. "Agricultural Price Policy." *Economic Times* (New Delhi).

Davis, Carlson. 1982. "Linkages Between Socioeconomic Characteristics, Food Expenditure Patterns, and Nutritional Status of Low-Income Households: A Critical Review." *American Journal of Agricultural Economics* 64:1017-25.

Davis, J. M. 1977. *The Fiscal Role of Food Subsidy Programs.* IMF Staff Papers 24:100-27.

Deaton, Angus. 1982. "Inequality and Needs: Some Experimental Results for Sri Lanka." In *Population and Development Review* 8 (supplement):34-49.

de Janvry, A. 1983. "Forced Deliveries: Their Impact on the Marketed Surplus and the Distribution of Income in Egyptian Agriculture." University of California, Berkeley.

de Janvry, A.; Siam, G; and Gad, O. 1983. "The Impact of Forced Deliveries on Egyptian Agriculture." *American Journal of Agricultural Economics* 65: 493-501.

de Janvry, A., and Subbarao, K. 1984. "Agricultural Price Policy and Income Distribution in India." *Economic and Political Weekly* 19:A-166-77.

Dervis, K.; de Melo, J.; and Robinson, S. 1982. *General Equilibrium Models for Development Policy.* Cambridge: Cambridge University Press.

Dethier, J. J. 1985. "The Political Economy of Food Prices in Egypt." Ph.D. diss., University of California, Berkeley.

Dethier, J. J., and Estahani, H. 1981. "Macro-Effects of Alternative Price Policies in Egypt." Economics Working Paper 188. Agricultural Development Systems Project, Ministry of Agriculture, Cairo, and the University of California, Berkeley.

De Wulf, L. 1975. "Fiscal Incidence Studies in Developing Countries: Survey and Critique." *IMF Staff Papers* 22:61–131.

Dodge, D. J. 1976. *Agricultural Policy and Performance in Zambia.* Berkeley and Los Angeles: University of California Press.

Dornbusch, Rudiger. 1974a. "Tariffs and Non-Traded Goods." *Journal of International Economics* 4:177–85.

———. 1974b. "Theory of Exchange Rate Changes." In *National Monetary Policies and the International Financial System,* ed. R. Z. Aliber. Chicago: University of Chicago Press.

———. 1980. *Open Economy Macroeconomics.* New York: Basic Books.

Echeverri, Ernesto. 1973. "Analisis de la Distribucion del Ingreso en Colombia por medio de los Coeficientes de Desigualdad" (Colombian Income Distribution Analysis by Means of Inequality Coefficients). Ph.D. diss., Bogota, Los Andes University, School of Economics.

Eckaus, R. S.; McCarthy, F. D.; and Mohie El-Din, A. 1979. *Multisector General Equilibrium Policy Models for Egypt.* Working Paper 233. Cambridge: Massachusetts Institute of Technology.

Eckaus, R. S., and Mohie El-Din, A. 1980. *Consequences of Changes in Subsidy Policy in Egypt.* Working Paper 265. Cambridge: Massachusetts Institute of Technology.

Edirisinghe, Neville. 1987. *The Food Stamp Scheme in Sri Lanka: Costs, Benefits, and Options for Modification.* Research Report 58. Washington, D.C.: International Food Policy Research Institute.

Edirisinghe, Neville, and Poleman, T. T. 1976. *Implications of Government Intervention in the Rice Economy of Sri Lanka.* International Agriculture Monograph 48. Ithaca, N.Y.: Cornell University Press.

Egypt (Nutrition Institute, Ministry of Health). 1978. *Arab Republic of Egypt National Nutrition Survey, 1978.* Washington, D.C.: U.S. Agency for International Development.

Evenson, Robert; Popkin, Barry; and Quizon, Elizabeth. 1977. "Nutrition Work and Demographic Behavior in Rural Philippine Households." University of North Carolina.

Ez Elarab, M. 1982. "Separability and the Demand for Egyptian Imports." Ph.D. diss., North Carolina State University.

Ferreira e Silva, T. 1981. "Politica Triticola—Efeitos de Uma Reducao no Subsidio." Master's thesis, Universidade Federal de Vicosa, Brazil.

Fersch, Robert. 1981. "Food Stamps: Program at a Crossroad." *Public Welfare* 39:9–14.

Fertilizer Association of India. 1982. *Fertilizer Statistics.* New Delhi: Fertilizer Association of India. *Financial Times* (London). June 7, 1984.

Fischer, S. 1977. "Stability and Exchange Rate Systems in Monetarist Model of the Balance of Payments." In *The Political Economy of Monetary Reform*, ed. R. Z. Aliber. Montclair, N.J.: Allanheld, Osmun.

Floyd, John E. 1965. "The Effects of Farm Price Supports on the Returns to Land and Labor in Agriculture." *Journal of Political Economy* 73:148-58.

Food and Agriculture Organization (United Nations). Various years. *Trade Yearbook*. Rome: FAO.

Food Corporation of India. Various years. *Annual Report*. New Delhi: Food Corporation of India.

———. 1977. *Fourth World Survey*. Rome: FAO.

Fraenkel, J. A., and Johnson, H. G., eds. 1978. *The Economics of Exchange Rates*. Reading, Mass.: Addison Wesley.

Fraker, Thomas; Devaney, Barbara; and Cavin, Edward. 1986. "An Evaluation of the Effect of Cashing Out Food Stamps on Food Expenditures." *American Economic Review* 76:230-34.

Franklin, D.; Harrell, M.; and Demousis, M. 1984. "Income Effects of Donated Commodities in Rural Panama." Raleigh, N.C., Sigma One Corporation.

Freeman, R. B. 1981. "The Food Stamp Program After One Year: An Economic Appraisal." Harvard University.

Garcia, Jorge Garcia. 1981. *The Effects of Exchange Rates and Commercial Policy on Agricultural Incentives in Colombia: 1953-1979*. Research Report 24. Washington, D.C.: International Food Policy Research Institute.

Garcia, Marito H., and Pinstrup-Andersen, Per. 1987. *The Pilot Food Price Subsidy Scheme in the Philippines: Its Impact on Income, Food Consumption, and Nutritional Status*. Research Report 61. Washington, D.C.: International Food Policy Research Institute.

Garcia, Marito H., et al. 1982. "Effects of Large-Scale Rural Development Project in Palawan (Philippines) on Nutrition." Cornell University, Nutrition Surveillance Program.

Garcia-Alba, P., and Serra-Puche, J. 1983. *Financial Aspects of Macroeconomic Management in Mexico*. Joint Research Program Series 36. Tokyo: Institute of Development Economics.

Gardner, B. 1983. "Efficient Redistribution Through Commodity Markets." *American Journal of Agricultural Economics* 65:223-34.

Garg, Vipin K. 1980. *State in Foodgrain Trade in India*. New Delhi: Vision Books.

Gavan, James D. and Sri Chandrasekera, Indrani. 1979. *The Impact of Public Foodgrain Distribution on Food Consumption and Welfare in Sri Lanka*. Research Report 13. Washington, D.C.: International Food Policy Research Institute.

George, P. S. 1979. *Public Distribution of Foodgrains in Kerala: Income Distribution Implications and Effectiveness*. Research Report 7. Washington, D.C.: International Food Policy Research Institute.

———. 1983. *Government Intervention in Foodgrain Markets in India*. Ahmedabad: Indian Institute of Management.

———. 1985. *Aspects of Procurement and Distribution of Foodgrains in India*. Working Paper on Food Subsidies 1. Washington, D.C.: International Food Policy Research Institute.

Girton, L., and Roper, D. 1977. "A Monetary Model of Exchange Market Pressure Applied to the Post-War Canadian Experience." *American Economic Review* 67:537-48.

Goldman, R., and Timmer, C. Peter. 1980. "The Scope and Limits of Food Price Policy in Sri Lanka." Harvard Institute for International Development.

Gotsch, C., and Brown, G. 1980. *Taxes and Subsidies in Pakistan Agriculture, 1966-76.* Staff Working Paper 387. Washington, D.C: World Bank.

Goueli, Ahmed A. 1981. "Food Security Program in Egypt." In *Food Security for Developing Countries*, ed. Alberto Valdés. Boulder, Colo.: Westview.

Green, C. J. 1983. "Insulating Countries Against Fluctuations in Domestic Production and Exports: An Analysis of Compensatory Financing Schemes." *Journal of Development Economics* 12:303-25

Gupta, A. 1977. *Public Distribution of Foodgrains in India.* Centre for Management in Agriculture Monograph 29. Ahmedabad: Indian Institute of Management.

Guzman, C. German; Orlando, Fals Borda; and Orlando, Umana Luna. 1977. *La Violencia en Colombia* (The Violence in Colombia). Bogota: Punta de Lanza.

Hall, L. L. 1980. "Evaluating the Effects of P.L. 480 Wheat Imports in the Brazilian Grain Sector." *American Journal of Agricultural Economics* 62:19-28.

Hammer, Jeffrey. 1978. "The Determinants of Malnutrition in Pakistan." Ph.D. diss., Massachusetts Institute of Technology.

Harberger, A. C. 1978. "On the Use of Distributional Weights in Social Cost-Benefit Analysis." *Journal of Political Economy* 86:87-120.

———. 1984. "Basic Needs versus Distributional Weights in Social Cost-Benefit Analysis." *Economic Development and Cultural Change* 32:455-74.

Harding, Harry. 1984. Senior Fellow, Brookings Institute. Personal communication.

Hayami, Y.; Subbarao, K.; and Otsuka, Keijiro. 1982. "Efficiency and Equity in the Producer Levy of India." *American Journal of Agricultural Economics* 64:655-63.

Hazell, Peter B. R., and Röell, Ailsa. 1983. *Rural Growth Linkages: Household Expenditure Patterns in Malaysia and Nigeria.* Research Report 41. Washington, D.C.: International Food Policy Research Institute.

Heclo, Hugh. 1977. *Strangers in Politics.* Washington, D.C.: Brookings.

Herbert, L., and Scandizzo, P. 1982. *Food Distribution and Nutrition Intervention: The Case of Chile.* Staff Working Paper 512. Washington, D.C.: World Bank.

Hicks, N. 1979. "Growth vs. Basic Needs." *World Development* 7:985-94.

Homen de Melo, F. 1983. *O Problema Alimentar no Brasil.* Rio de Janeiro: Paz e Terra.

Hopkins, Raymond; Puchala, Donald; and Talbot, Ross, eds. 1979. *Food, Politics, and Agricultural Development.* Boulder, Colo.: Westview.

Hossain, Mahabub. 1984. *Food Strategy Review Exercise.* Technical Paper A. Dhaka: Bangladesh Institute of Development Studies.

Huddleston, Barbara. 1984. *Closing the Cereals Gap with Trade and Food Aid.* Research Report 44. Washington, D.C.: International Food Policy Research Institute.

Huddleston, Barbara; Johnson, Gale D.; Reutlinger, Shlomo; and Valdés, Alberto. 1981. *International Financial Arrangements for Food Security*. Baltimore: Johns Hopkins University Press.

Huntington, Samuel. 1968. *Political Order in Changing Societies*. New Haven, Conn.: Yale University Press.

Ilchman, Warren F., and Uphoff, Norman. 1969. *The Political Economy of Change*. Berkeley and Los Angeles: University of California Press.

India, Ministry of Agriculture. Various issues. *Agricultural Situation in India*. New Delhi: Ministry of Agriculture, Directorate of Economics and Statistics.

———. Various issues. *Bulletin of Food Statistics*. New Delhi. Ministy of Agriculture, Directorate of Economics and Statistics.

———. Various issues. *Economic Survey*. New Delhi: Ministry of Agriculture, Directorate of Economics and Statistics.

———. Various titles. Reports of the Agricultural Prices Commission. New Delhi: Ministry of Agriculture.

———. Various titles. Reports of the Cost of Production Studies. New Delhi: Ministry of Agriculture, Directorate of Economics and Statistics.

Infante, Adriana. 1982. "El Impacto de Factores Economicos y Sociales sobre los Niveles Nutricionales de la Poblacion Colombiana" (The Impact of Social and Economic Factors on the Nutritional Levels of the Colombian Population). Ph.D. diss., Los Andes University, Colombia.

INFS. 1980. *Acceptance of Sorghum II*. Dhaka: Institute of Nutrition and Food Science.

Isenman, Paul. 1980. "Basic Needs: The Case of Sri Lanka." *World Development* 8:237-58.

Islam, B. 1978. "Price, Income, and Foreign Exchange Elasticity of Asian Rice Imports." *American Journal of Agricultural Economics* 60:532-35.

Josling, Timothy. 1980. *Developed Country Agricultural Policies and Developing Country Supplies: The Case of Wheat*. Research Report 14. Washington, D.C.: International Food Policy Research Institute.

Junginger-Dittel, K. O., and Reisen, H 1979. "Imports Instability and LDC's Response: The Destabilization of the Inflow of Capital and Intermediate Goods." *Weltwirtschaftliches Archiv* 115:653-69.

Kalmonovitz, Salomon. 1978. "Desarrollo Capitalista en el Campo Colombiano" (Rural Capitalist Development in Colombia). In *Colombia Today*, ed. Mario Arrubia. Bogota: Siglo XXI.

Karim, Rezaul; Majid, Manjur; and Levinson, James F. 1980. "The Bangladesh Sorghum Experiment." *Food Policy* 5:61-63.

Keeler, A. G.; Scobie, Grant M.; Renkow, M. A.; and Franklin, D. L. 1982. *The Consumption Effects of Agricultural Poticies in Tanzania*. Raleigh, N.C.: Sigma One.

Kennedy, Eileen T. 1983. "Determinants of Family and Preschooler Food Consumption." *Food and Nutrition Bulletin* 5:22-29.

Kennedy, Eileen T., and Pinstrup-Andersen, Per. 1982. *Nutrition-Related Policies and Programs: Past Performances and Research Needs*. Washington, D.C.: International Food Policy Research Institute.

Khan, Riaz Ahmad. 1982. *Issues of Food Distribution in Pakistan.* Staff Paper AE-101. Islamabad: Pakistan Agricultural Research Council.

Kielmann, A.; Taylor, C. E.; and Parker, R. L. 1978. "The Narangwal Nutrition Study: A Summary Review." *American Journal of Clinical Nutrition* 31:2040-52.

Knight, Henry. 1954. *Food Administration in India, 1937-47.* Stanford, Calif.: Stanford University Press.

Knight, P. T. 1971. *Brazilian Agricultural Technology and Trade—A Study of Five Commodities.* New York: Praeger.

Knudsen, O. K., and Scandizzo, Pasquale L. 1979. *Nutrition and Food Needs in Developing Countries.* Staff Working Paper 328. Washington, D.C.: World Bank.

Krishna, Raj. 1967. "Agricultural Price Policy and Economic Development." In *Agricultural Development and Economic Growth,* ed. H. Southworth and B. F. Johnson. Ithaca, N.Y.: Cornell University Press.

Krishna, Raj, and Chibber, Ajay. 1983. *Policy Modelling of a Dual Grain Market: The Case of Wheat in India.* Research Report 38. Washington, D.C.: International Food Policy Research Institute.

Krishna, Raj, and Raychaudhuri, G. S. 1980. *Some Aspects of Wheat and Rice Policy in India.* Staff Working Paper 381. Washington, D.C: World Bank.

Kumar, Shubh K. 1979. *Impact of Subsidized Rice on Food Consumption and Nutrition in Kerala.* Research Report 5. Washington, D.C.: International Food Policy Research Institute.

———. Forthcoming. *Maize Policies in Zambia: Implications for Agricultural Commercialization and Nutrition.* Washington, D.C.: International Food Policy Research Institute.

Lambert, Julian. 1983. *The Nutrition Status of Women and Children in Pakistan.* Islamabad: UNICEF.

Lane, Sylvia. 1978. "Food Distribution and Food Stamp Program Effects on Food Consumption and Nutritional Achievement of Low-Income Persons in Kern County, California." *American Journal of Agricultural Economics* 60: 108-16.

Lardy, N. R. 1983. *Agricultural Prices in China.* Staff Working Paper 606. Washington, D.C.: World Bank.

Laswell, Harold, and Kaplan, Abraham. 1950. *Power and Society.* New Haven, Conn.: Yale University Press.

Latham, Michael C. 1985. "The Relationship of Nutrition to Productivity and Well-being of Workers." Paper presented at International Food Policy Research Institute/United Nations University Workshop on the Political Economy of Nutritional Improvements. Berkeley Springs, W. Va., June 10-14.

Lattimore, R. G., and Schuh, G. E. 1979. "Endogenous Policy Determination: The Case of the Brazilian Beef Sector." *Canadian Journal of Agricultural Economics* 27:1-16.

Lau, L. J.; Yotopoulos, P. A.; Chou, E. C.; and Lin, W. 1981. "The Microeconomics of Distribution: A Simulation of the Farm Economy." *Journal of Policy Modeling* 3:175-206.

Lewis, W. A. 1954. "Economic Growth with Unlimited Supplies of Labour." *Manchester School of Economic and Social Studies* 22:139-91.

Lipton, Michael. 1977. *Why Poor People Stay Poor.* Cambridge, Mass.: Harvard University Press.

———. 1983. *Poverty, Undernutrition, and Hunger.* Staff Working Paper 597. Washington, D.C.: World Bank.

Lofchie, M. F. 1978. "Agrarian Crisis and Economic Liberalization in Tanzania." *Journal of Modern African Studies* 16:451–75.

Lustig, Nora. 1983. "Un Analisis de Politicas de Consumo Alimentario en Equilibrio Parcial y Equilibrio General." Paper presented to the Fourth Congress of the Latin American Econometric Society, Santiago.

Lustig, N., and Martin Del Campo, A. 1983. "Price and Subsidy Policies in Mexico: An Analysis of CONASUPO's Intervention." Mexico City, El Colegio de México.

McCarthy, F. D. 1978. *Food and Nutrition Planning in Pakistan.* International Nutrition Planning Program Discussion Paper 12. Cambridge: Massachusetts Institute of Technology.

McCarthy, F. D., and Taylor, Lance. 1980. "Macro Food Policy Planning: A General Equilibrium Model for Pakistan." *Review of Economics and Statistics* 62:107–21.

MacDonald, M. 1977. *Food Stamps and Income Maintenance.* New York: Academic Press, for the Institute for Research on Poverty.

Madden, P. J., and Yoder, M. D. 1972. *Program Evaluation: Food Stamps and Commodity Distribution in Rural Areas of Central Pennsylvania.* Agricultural Experiment Station Bulletin 80. University Park: Pennsylvania State University.

Mateus, A. 1983. *Targeting Food Subsidies for the Needy.* Staff Working Paper 617. Washington, D.C.: World Bank.

Mears, L. A., and Moeljono, S. 1981. "Food Policy." In *The Indonesian Economy During the Soeharto Era,* ed. A. Booth and P. McCawley. London: Oxford University Press.

Mellor, John W. 1968. "Functions of Agricultural Prices in Economic Development." *Indian Journal of Agricultural Economics* 23:23–37.

———. 1978. "Food Price Policy and Income Distribution in Low-Income Countries." *Economic Development and Cultural Change* 27:1–26.

———. 1980. "Food Aid and Nutrition." *American Journal of Agricultural Economics* 62:979–83.

Mellor, John W., and Johnston, Bruce F. 1984. "The World Food Equation: Interrelations Among Development, Employment, and Food Consumption." *Journal of Economic Literature* 22:531–74.

Mexico. 1977. *Household Income Expenditure Survey.* Mexico City: Ministry of Programming and Budgeting.

Molina, S. 1980. "La Pobreza en America Latina." In *Se Puede Superar la Pobreza?* Santiago: ECLA/UNDP.

Montgomery, Rogers. 1983. *Open Market Grain Sales as a Public Policy Instrument for Moderating Food Price Fluctuations in Bangladesh.* Dhaka: U.S. Agency for International Development.

Moore, Clement Henry. 1974. "Authoritarian Politics in Unincorporated Society: The Case of Nasser's Egypt." *Comparative Politics* 6:193–218.

NAMBOARD. *Annual Report and Accounts.* Lusaka: NAMBOARD.

Nelson, Joan M. 1983. *The Political Economy of Stabilization in Small, Low-Income, Trade-Dependent Nations.* Washington, D.C.: U.S. Agency for International Development.

Nichols, Donald; Smolensky, E.; and Tideman, T. 1971. "Discrimination by Waiting Time in Merit Goods." *American Economic Review* 61:312-23.

Norton, Roger. 1984. *Policy Issues in Mexican Agriculture.* Washington, D.C.: World Bank.

Ochoa, Mario. 1980. *El Plan de Alimentacion y Nutricion en El Cauca (Una Vision Retrospectiva)* (The Food and Nutrition Plan in the Province of Cauca [A Retrospective View]). Bogota: FEDESARROLLO.

———. 1982. *Nutricion, Poblacion y Distribucion de Ingreso* (Nutrition, Population, and Income Distribution). Bogota: Avance.

———. 1983. "Hambre y Desnutricion en Colombia" (Hunger and Malnutrition in Colombia). *National Agriculture Review* 863:63-87.

Olson, Jr., Mancur. 1965. *The Logic of Collective Action.* Cambridge, Mass.: Harvard University Press.

Orden, D.; Roe, T.; and Schuh, G. E. 1982. "Policies Affecting the Food and Agricultural Section in Peru, 1970-1982: An Evaluation and Recommendations." U.S. Agency for International Development.

Osmani, S. R. 1984. *Results of the Household Survey: Short-Run Impact of Food-for-Work Projects.* Dhaka: Bangladesh Institute of Development Studies.

Overholt, Catherine, et al. 1981. "Subsidized Milk Distribution in Mexico." In *Consumer Food Price Subsidies,* ed. Beatrice Rogers et al. Study V of *Nutrition Intervention in Developing Countries,* ed. J. E. Austin and M. F. Zeitlin. Cambridge, Mass.: Oelgeschlager, Gunn, and Hain.

Pakistan. 1978. *Micronutrient Survey of Pakistan, 1976-77.* Vols. 1-2. Islamabad: Government of Pakistan, Planning Division.

Pal, Ranjan, and Quizon, Jaime. 1983. *Factor Costs, Income and Supply Shares in Indian Agriculture.* Agricultural Research Unit Discussion Paper 16. Washington, D.C.: World Bank.

Palacpac, Adelita C. 1982. *World Rice Statistics.* Los Banos, Laguna, the Philippines: International Rice Research Institute.

"Participatory Development and Dependence: The Case of Sri Lanka." 1979. Colombo, Marga Institute.

Peltzman, S. 1980. "Growth of Government." *Journal of Law and Economics* 23:208-88.

Pereira Soares, A. 1980. "Avaliacao Economica da Politica Triticola de 1967-1977." *Colecao Analise e Pesquisa,* vol. 20. Brasilia: Ministerio da Agricultura, Comissao de Financiamento de Producao.

Perrin, R. K., and Scobie, Grant M. 1981. "Market Intervention Policies for Increasing the Consumption of Nutrients by Low-Income Households." *American Journal of Agricultural Economics* 63:73-82.

Philippines. 1978. "Nutrition Program in the Philippines." Manila, National Economic Development Authority, Ministry of Agriculture, Task Force on Nutrition.

——. 1979. "Report of the Task Force to Formulate New Strategies for Nutrition Development in the Philippines." Manila, National Economic Development Authority, Ministry of Agriculture, Task Force on Nutrition.

———. 1982. *Nationwide Food Consumption and Nutrition Survey, 1982.* Manila: Food and Nutrition Research Institute.

———. 1984. *Second Nationwide Nutrition Survey, 1982.* Manila, Food and Nutrition Institute.

Pinstrup-Andersen, Per. 1981. *Nutritional Consequences of Agricultural Projects: Conceptual Relationships and Assessment Approaches.* Staff Working Paper 456. Washington, D.C.: World Bank.

———. 1984. "The Nutritional Impact of the Colombian Food and Nutrition Program in the State of Cauca, Colombia." Washington, D.C., International Food Policy Research Institute.

———. 1985a. "Food Prices and the Poor in Developing Countries." *European Review of Agricultural Economics* 12:69-81.

———. 1985b. "The Impact of Export Crop Production on Human Nutrition." In *Nutrition and Development*, ed. Margaret Biswas and Per Pinstrup-Andersen. Oxford: Oxford University Press.

———. 1987. "Nutrition Interventions." In *Adjustment with a Human Face: Protecting the Vulnerable and Promoting Growth*, vol. 1, ed. Giovanni Andrea Cornia, Richard Jolly, and Frances Stewart. Oxford: Oxford University Press.

———. 1988a. "Assuring Food Security and Adequate Nutrition for the Poor." In *Health, Nutrition, and Economic Crisis*, ed. David Bell and Michael Reich. Dover, Mass.: Auburn House Publishing.

———. 1988b. "Food Subsidies: The Concern to Provide Consumer Welfare While Assuring Producer Incentives." In *Agricultural Price Policy for Developing Countries*, ed. John W. Mellor and Raisuddin Ahmed. Baltimore: Johns Hopkins University Press.

———. 1988c. "Macro-economic Adjustment and Human Nutrition." *Food Policy* 13:37-45.

Pinstrup-Andersen, Per; and Jaramillo, Mauricio; and Stewart, Frances. 1987. "The Impact on Government Expenditures." In *Adjustment with a Human Face: Protecting the Vulnerable and Promoting Growth*, vol. 1, ed. Giovanni Andrea Cornia, Richard Jolly, and Frances Stewart. Oxford: Oxford University Press.

Pitt, M. M. 1981. "Alternative Trade Strategies and Employment: Indonesia." In *Trade and Employment in Developing Countries*, vol. 1, *Individual Studies*, ed. A. O. Krueger; H. B. Lary; T. Monson; and N. Akrasanee. Chicago: University of Chicago Press.

———. 1983. "Food Preferences and Nutrition in Rural Bangladesh." *Review of Economics and Statistics* 65:105-14.

PNU (Project of Nutrition of the University of Valle). 1976. *Diagnostico de la Situacion Nutricional en el Departamento del Cauca* (Nutritional Diagnosis of the Province of Cauca). Final Report. Cali, Colombia: National Planning Department.

Prabha, T. 1983. "Public Distribution and Rice Procurement in Tamil Nadu." Ph.D. diss., Kerala University.

Pressman, Jeffrey L., and Wildavsky, Aaron. 1984. *Implementation*. 3d ed. Berkeley and Los Angeles: University of California Press.

Putnam, B. H., and Wilford, D. S. eds. 1979. *The Monetary Approach to International Adjustment*. New York: Praeger.

Quizon, Jaime, and Binswanger, Hans. 1986. "Income Distribution in India: The Impact of Policies and Growth in the Agricultural Sector." *World Bank Economic Review* 1:103–48.

Reardon, Tom. 1982. "Resena de 'Economias Regionales del Peru' por Efrain Gonzales de Olarte." *Economia*. Lima, Peru: Catholic University.

Reddaway, B. W. 1984. *Food Strategy Review Exercise: Summary Report*. Prepared for the Government of Bangladesh. Geneva: International Labor Organization.

Renaud, Bertrand, and Suphaphiphat, Phiphit. 1971. "The Effects of the Rice Export Tax on the Domestic Rice Price Level in Thailand." *Malayan Economic Review* 16:84–102.

Reutlinger, Shlomo, and Katona-Apte, J. 1984. "The Nutritional Impact of Food Aid: Criteria for the Selection of Cost-Effective Foods." *Nutrition Today* 19:20–28.

Reutlinger, Shlomo, and Selowsky, Marcelo. 1976. *Malnutrition and Poverty: Magnitude and Policy Options*. Baltimore: Johns Hopkins University Press.

Reyes Heroles, J. F. 1980. "Welfare Effects of Short-Term Macroeconomic Policies in a Dual Economy: The Case of Mexico." Ph.D. diss., Massachusetts Institute of Technology.

Riker, William H. 1962. *The Theory of Political Coalitions*. New Haven, Conn.: Yale University Press.

Rodriguez, Gigena G. 1983. "Sistemas Productivos y Polarización Social en el Agromexicano: Introducción y Sintesis." Mexico City, Economía Mexicana, Serie Temática, Sector Agropecuario, Centro de Investigación y Docencia Económicas, A.C.

Rogers, Beatrice. 1978. *Consumer Food Price Subsidies and Subsidized Food Distribution Systems in Pakistan*. International Nutrition Planning Program Discussion Paper 13. Cambridge: Massachusetts Institute of Technology.

———. 1981. "Pakistan: Nutrition Sector Assessment." Washington, D.C., World Bank.

———. 1983. "The Internal Dynamics of Households: A Critical Factor in Development Policy." Washington, D.C., U.S. Agency for International Development.

Rogers, Beatrice Lorge, and Levinson, James F. 1976. *Subsidized Food Consumption Systems in Low-Income Countries: The Pakistan Experience*. International Nutrition Planning Program Discussion Paper 6. Cambridge: Massachusetts Institute of Technology.

Rogers, Beatrice; Overholt, Catherine A.; Kennedy, Eileen; Sanchez, Federico; Chavez, Adolfo; Belding, Thomas K.; Timmer, C. Peter; and Austin, James E. 1981. *Consumer Food Price Subsidies*. Study V of *Nutrition Intervention in Developing Countries*, ed. J. E. Austin and M. F. Zeitlin. Cambridge, Mass.: Oelgeschlager, Gunn, and Hain.

Rohde, J.; Ismail, D.; and Sutrisno, R. 1975. "Mothers as Weight Watchers: The Road to Child Health in the Village." *Journal of Tropical Pediatrics* 21: 295-97.

Sahn, David. 1986. "Food Consumption Patterns and Parameters in Sri Lanka: The Causes and Control of Malnutrition." Washington, D.C., International Food Policy Research Institute. Mimeo.

———. 1988. "Changes in the Living Standards of the Poor in Sri Lanka During a Period of Macro-economic Restructuring." *World Development* 15:809-830.

Sahn, David E.; Rogers, Beatrice L.; and Nelson, David P. 1981. "Assessing the Uses of Food Aid: P.L. 480 Title II in India." *Ecology of Food and Nutrition* 10:153-61.

Sanittanont, Sura. 1966. "Thailand's Rice Export Tax: Its Effects on the Rice Economy." Ph.D. diss., University of Wisconsin.

Scandizzo, Pasquale, and Bruce, C. 1980. *Methodologies for Measuring Agricultural Price Intervention Effects.* Staff Working Paper 394. Washington, D.C.: World Bank.

Scandizzo, Pasquale, and Knudsen, O. 1980. "The Evaluation of the Benefits of Basic Needs Policies." *American Journal of Agricultural Economics* 62: 46-57.

Scandizzo, Pasquale, and Swamy, G. 1982. *Benefits and Costs of Food Distribution Policies: The Indian Case.* Staff Working Paper 509. Washington, D.C.: World Bank.

Scandizzo, Pasquale, and Tsakok, I. 1985. "Food Price Policies in Developing Countries." In *Nutrition and Development*, ed. Margaret Biswas and Per Pinstrup-Andersen. Oxford: Oxford University Press.

Schuh, G. E. 1968. "Effects of Some General Economic Development Policies on Agricultural Development." *American Journal of Agricultural Economics* 50:1283-93.

———. 1974. "The Exchange Rate and U.S. Agriculture." *American Journal of Agricultural Economics* 56:1-13.

———. 1976. "The New Macroeconomics of Agriculture." *American Journal of Agricultural Economics* 58:802-11.

———. 1980. "Post Keynesian Economics and Agriculture: Discussion." *American Journal of Agricultural Economics* 62:328-30.

Schultz, Theodore W. 1964. *Economic Crisis in World Agriculture.* Ann Arbor: University of Michigan Press.

———, ed. 1978. *Distortions of Agricultural Incentives.* Bloomington: Indiana University Press.

Scobie, Grant M. 1980. "Food Security in a Macro Setting: Toward an Analytical Framework." Washington, D.C., International Food Policy Research Institute.

———. 1981. *Government Policy and Food Imports: The Case of Wheat in Egypt.* Research Report 29. Washington, D.C.: International Food Policy Research Institute.

———. 1983. *Food Subsidies in Egypt: Their Impact on Foreign Exchange and Trade.* Research Report 40. Washington, D.C.: International Food Policy Research Institute.

———. 1984. *Egyptian Public Food Program Study: Report on Task 5—Food Subsidies and the Government Budget in Egypt.* Washington, D.C.: International Food Policy Research Institute.

Scobie, Grant M., and Posada, T. R. 1978. "Technical Change and Income Distribution: The Case of Rice in Colombia." *American Journal of Agricultural Economics* 60:85–92.

Scobie, Grant M., and Valdés, Alberto E. 1982. "Modelacion de Politica Gubernamental: El Caso de las Importaciones de Alimentos: Politica de Precios y la Balanza de Pagos en Egipto." *Cuadernos de Economia* 58:325–56.

Scott, James C. 1985. *Weapons of the Weak: Everyday Forms of Peasant Resistance.* New Haven, Conn.: Yale University Press.

Seers, D. 1962. "A Theory of Inflation and Growth in Underdeveloped Countries." *Oxford Economic Papers* 14:173–95.

Selowsky, Marcelo. 1979a. *Balancing Trickle Down and Basic Needs Strategies: Income Distribution Issues in Large Middle-Income Countries with Special Reference to Latin America.* Staff Working Paper 335. Washington, D.C.: World Bank.

———. 1979b. "Target Group-Oriented Food Programs: Cost Effective Comparisons." *American Journal of Agricultural Economics* 61:988–94.

———. 1979c. *Who Benefits from Government Expenditure? A Case Study of Colombia.* New York: Oxford University Press.

———. 1980. "Food Prices and the Indexing of Food Stamp Programs in Sri Lanka: An Evaluation of the Trade-Offs." Washington, D.C., World Bank.

———. 1981. "Income Distribution, Basic Needs, and Tradeoffs with Growth." *World Development* 9:73–92.

Sen, Amartya. 1981. *Poverty and Famines: An Essay on Entitlement and Deprivation.* Oxford: Oxford University Press.

Senauer, Benjamin; Roe, T.; and Greene, D. 1982. "An Analysis of Food Grain Price and Trade Policy in the Dominican Republic." University of Minnesota, Department of Agricultural and Applied Economics.

Senauer, Benjamin, and Young, Nathan. 1986. "The Impact of Food Stamps on Food Expenditures: Rejection of the Traditional Model." *American Journal of Agricultural Economics* 68:37–43.

SER. 1980. *Analisis de la Encuesta PAN-77. IFT-026* (PAN-77 Survey Analysis. IFT-026). Bogota: SER.

———. 1981. *Depuracion de la Informacion de Alimentos de la Encuesta PAN-79. IFT-037* (Analysis of the Data from PAN-79 Survey. IFT-037). Bogota: SER.

Shei, S. Y., and Thompson, R. L. 1977. "The Impact of Trade Restrictions on Price Stability in the World Wheat Market." *American Journal of Agricultural Economics* 59:628–38.

Siamwalla, Ammar. 1975. "A History of Rice Policies in Thailand." *Food Research Institute Studies* 14:233–49.

———. 1988. "Public Stock Management and Its Implications for Prices and Supply." In *Agricultural Price Policy for Developing Countries*, ed. John W. Melior and Raisuddin Ahmed. Baltimore: Johns Hopkins University Press.

Siamwalla, Ammar; Pinthong, Chirmsak; and Tosanguan, Vatchariya. 1981. *Agricultural Pricing and Marketing Policy in Thailand.* Bangkok: National Economic and Social Development Board.

Siamwalla, Ammar, and Valdés, Alberto. 1980. "Food Insecurity in Developing Countries." *Food Policy* 5:258–72.

Siraj, ul Haq Mahmoud. 1983. *Primary Health Care in Pakistan.* Islamabad: Government of Pakistan, Planning and Development Division.

Sjaastad, L. A. 1980. "The Incidence of a Uniform Tariff in Uruguay." University of Chicago.

———. 1981. "Commercial Policy, 'True' Tariffs and Relative Prices." In *Current Issues in Commercial Policy and Diplomacy,* ed. J. Black and B. Hindley. New York: St. Martin's.

Sjaastad, L. A., and Clements, K. W. 1981. "The Incidence of Protection: Theory and Measurement." Paper presented at a conference on the Free Trade Movement in Latin America, Hamburg.

Sri Lanka. 1972. *Special Report on Food and Nutritional Levels of Sri Lanka.* Colombo: Department of Census and Statistics.

———. 1983. "Administrative Report of the Food Commissioner, 1979–1981." Colombo, Food Commissioner Department.

Stern, Linda Jo. 1984. State Coordinator, Massachusetts Special Supplemental Feeding Program for Women, Infants, and Children. Personal communication.

Strauss, John. 1985. "The Impact of Improved Nutrition on Labor, Productivity, and Human Resource Development." Paper presented at International Food Policy Research Institute/United Nations University Workshop on the Political Economy of Nutritional Improvements. Berkeley Springs, W. Va., June 10–14.

Streeten, P. 1979. "Basic Needs: Premises and Promises." *Journal of Policy Modeling* 1:136–46.

Streeten, P., and Burki, S. J. 1978. "Basic Needs: Some Issues." *World Development* 6:411–26.

Streeten, P., et al. 1982. *First Things First: Meeting Basic Human Needs in Developing Countries.* London: Oxford University Press.

Subbarao, K. 1977. "Market Structure in Indian Agriculture: A Study of Economic Efficiency of Paddy-Rice Marketing System in West Godavri District." Ph.D. diss., University of Delhi.

Taylor, Lance. 1979. *Macro Models for Developing Countries.* New York: McGraw-Hill.

———. 1980. "Price Policy and the Food that People Consume." In *Price Policies and Nutrition in Latin America,* ed. G. Solimaro and L. Taylor. Tokyo: United Nations University Press.

———. 1981. "IS/LM in the Tropics: Diagrammatics of the New Structuralist Macro Critique." In *Economic Stabilization in Developing Countries,* ed. W. R. Cline and S. Weintraub. Washington, D.C.: Brookings.

———. 1982. "Food Price Inflation, Terms of Trade and Growth." In *The Theory and Experience of Economic Development: Essays in Honor of Sir W. Arthur Lewis,* ed. Mark Gersovitz et al. London: Allen and Unwin.

———. 1983. *Structural Macroeconomics: Applicable Models for the Third World.* New York: Basic Books.

Taylor, Lance; Horton, Susan; and Raff, D. 1983. "Food Subsidy Programs: Practice and Policy Lessons." Massachusetts Institute of Technology.

Thailand. 1976. *1975–76 Socioeconomic Survey Data Tape.* Bangkok: National Statistical Office.

Thamarajakshi, R. 1969. "Intersectoral Terms of Trade and Marketed Surplus of Agriculture Produce." *Economic and Political Weekly* 4:A91–A102.

Thanapornpan, Rangsan. 1980. "The Roles of the Farmers' Aid Fund." Report presented to the National Economic and Social Development Board of Thailand. Thammasat University.

Thomas, John W. 1982. "National Decisionmaking and Management of Food Aid and Food Policy." In *Developmental Effectiveness of Food Aid in Africa.* New York: Agricultural Development Council.

Thorbecke, Erik, and Svejnar, Jan. 1984. *Effects of Macroeconomic Policies on Agricultural Performance in Sri Lanka, 1960–81.* Paris: OECD.

Tilley, Charles, ed. 1975. *The Formation of Nation-States in Western Europe.* Princeton, N.J.: Princeton University Press.

Timmer, C. Peter. 1981. "China and the World Food System." In *Research in Domestic and International Agribusiness Management.* Vol. 2. Greenwich, Conn.: Jai Press.

———. 1984. "Private Decisions and Public Policy: The Food Price Dilemma in Developing Countries." Paper presented at a conference on World Food Policy, Harvard Business School, Boston, April 8–11.

Timmer, C. Peter, and Alderman, Harold. 1979. "Estimating Consumption Parameters for Food Policy Analysis." *American Journal of Agricultural Economics* 61:982–87.

Timmer, C. Peter, and Falcon, Walter P. 1975. "The Political Economy of Rice Production and Trade in Asia." In *Agriculture in Development Theory,* ed. Lloyd G. Reynolds. New Haven, Conn.: Yale University Press.

Timmer, C. P.; Falcon, W. P.; and Pearson, S. R. 1983. *Food Policy Analysis.* Baltimore: Johns Hopkins University Press.

Timmer, C. Peter, et al. 1982. *Introduction to Food Policy.* Washington, D.C.: World Bank.

Tobin, James. 1952. "A Survey of the Theory of Rationing." *Econometrica* 20:521–53.

Tolley, G. S.; Thomas, V.; and Wong, C. M. 1982. *Agricultural Price Policies and the Developing Countries.* Baltimore: Johns Hopkins University Press.

Torche, A. 1985. "Evaluacion Economica del Programa Nacional de Alimentacion Complementaria (PNAC)." *Cuadernos de Economia* 66:175–94.

Trairatvorakul, Prasarn. 1984. *The Effects on Income Distribution and Nutrition of Alternative Rice Price Policies in Thailand.* Research Report 46. Washington, D.C.: International Food Policy Research Institute.

Tyers, R., and Rachman, A. 1982. "Food Security, Consumption Diversification and Foreign Exchange Balances in Indonesia: Results from a Multicommodity Simulation." *Journal of Policy Modeling* 4:363–93.

Underwood, B., ed. 1983. *Nutrition Intervention Strategies in National Development.* New York: Academic.

Urrutia, Miguel, and Berry, Albert. 1975. *La Distribucion del Ingreso en Colombia* (The Colombian Income Distribution). Medellin: La Carreta.

U.S. Department of Agriculture. 1981. *Food Problems and Prospects in Sub-Saharan Africa.* Washington, D.C.: USDA.

———. 1984. "Food Spending and Income." *National Food Review* 25:26.

Valdés, Alberto, and Sianwalla, Ammar. 1988. "Foreign Trade Regime, Exchange Rate Policy, and the Structure of Incentives." In *Agricultural Price Policy for Developing Countries,* ed. John W. Mellor and Raisuddin Ahmed. Baltimore: Johns Hopkins University Press.

von Braun, Joachim, and de Haen, Hartwig. 1983. *The Effects of Food Price and Subsidy Policies on Egyptian Agriculture.* Research Report 42. Washington, D.C.: International Food Policy Research Institute.

Wall, John. 1978. *Foodgrain Management: Pricing, Procurement, Distribution, Import, and Storage Policy in India.* Staff Working Paper 279. Washington, D.C.: World Bank.

Waterbury, John. 1978. *Egypt: Burdens of the Past: Options for the Future.* Bloomington: Indiana University Press.

———. 1983. *The Egypt of Nasser and Sadat.* Princeton, N.J.: Princeton University Press.

Waterlow, J. C. 1973. "Note on the Assessment and Classification of Protein-Energy Malnutrition in Children." *Lancet* 2:87–89.

West, D. A. 1978. *Food Program Evaluation: The Washington State Experience.* Washington, D.C.: U.S. Department of Agriculture, Economics, Statistics and Cooperatives Service.

West, D. A., and Price, D. W. 1976. "The Effects of Income, Assets, Food Programs and Household Size on Food Consumption." *American Journal of Agricultural Economics* 58:725–30.

Wheeler, D. 1980. "Basic Needs Fulfillment and Economic Growth: A Simultaneous Model." *Journal of Development Studies* 7:435–51.

Williamson-Gray, Cheryl. 1982. *Food Consumption Parameters for Brazil and Their Application to Food Policy.* Research Report 32. Washington, D.C.: International Food Policy Research Institute.

Wong, C. M. 1978. "A Model for Evaluating the Effects of Thai Government Taxation of Rice Exports on Trade and Welfare." *American Journal of Agricultural Economics* 60:65–73.

World Bank. 1979. *Bangladesh: Food Policy Issues.* Report 2761-BD. Washington, D.C.: World Bank.

———. 1981. *Zambia: Country Economic Memorandum.* Washington, D.C.: World Bank.

———. 1982. *Economic Adjustments in Sri Lanka: Issues and Prospects.* Washington, D.C.: World Bank.

———. 1984a. *PHN Nutrition Review.* Washington, D.C.: World Bank.

———. 1984b. *Price Prospects for Major Primary Commodities.* Vol. 2. Washington, D.C.: World Bank.

———. 1984c. *World Development Report, 1983.* Washington, D.C : World Bank.

———. 1986. *Poverty and Hunger: Issues and Options for Food Security in Developing Countries.* Washington, D.C.: World Bank.

Yoshimura, H.; Ferera, M. P.; and Cunawardene, F. J. 1975. *Some Aspects of Paddy and Rice Marketing in Sri Lanka.* Occasional Publication Series 10. Colombo, Sri Lanka: Agrarian Research and Training Institute.

Zambia. *Agricultural Statistical Bulletin.* Annual. Lusaka: Ministry of Agriculture and Water Development.

———. *Consumer Price Statistics.* Quarterly. Lusaka: Central Statistical Office.

———. 1986. *Country Profile: Zambia 1985.* Lusaka: Central Statistical Office.

Zylbersztajn, D. 1983. "Price Distortions in Brazilian Agriculture: An Application of Duality Theory and Flexible Functional Forms." Ph.D. diss., North Carolina State University.

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