A Comparison of Food Assistance Programs in Mexico and the United States. By Craig Gundersen, Mara Yañez, Constanza Valdez, and Betsey Kuhn. Food Assistance and Nutrition Research Report No. 6.

Abstract

The social safety nets in Mexico and the United States rely heavily on food assistance programs to ensure food security and access to safe and nutritious foods. To achieve these general goals, both countries' programs are exclusively paid for out of internal funds and both target low-income households and/or individuals. Despite those similarities, economic, cultural, and demographic differences between the countries lead to differences in their abilities to ensure food security and access to safe and nutritious foods. Mexico uses geographic and household targeting to distribute benefits while the United States uses only household targeting. U.S. food assistance programs tend to be countercyclical (as the economy expands, food assistance expenditures decline and vice-versa). Mexican food assistance programs appear to be neither counter- nor procyclical. Food assistance programs have little effect on the extent of poverty in Mexico, while the opposite is true in the United States, primarily because the level of benefits as a percentage of income is much lower in Mexico and a much higher percentage of eligible households receive benefits from food assistance programs in the United States.

Keywords: Food assistance programs, social safety net, targeting methods, macroeconomy, poverty, Progresa, DICONSA, FIDELIST, LICONSA, DIF, Food Stamp Program, WIC, the National School Lunch and Breakfast Programs

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Preface

Under the auspices of the Mexico Emerging Markets Program, the Economic Research Service of the U.S. Department of Agriculture and the Mexican Secretaria de Agricultura, Ganaderia y Desarrollo Rural (SAGAR) established a project to compare food assistance programs in Mexico and the United States. While a great deal of research has been conducted analyzing each nation's food assistance programs, there have been no studies comparing the two countries' food assistance programs. This absence of studies has limited the crucial insights policymakers and researchers can obtain through such comparisons. This report represents the first published contribution to this ongoing project.

Summary

Food assistance programs are integral components of the social safety net in both Mexico and the United States. About one in five Mexicans and one in six Americans receive benefits from at least one federally funded food assistance program. This assistance helps ensure that people, especially children, are food secure and have access to a safe and nutritious diet. To achieve these general goals, both countries' programs are internally funded, and both target benefits to low-income households rather than to the general population. Despite those similarities, economic, cultural, and demographic differences between the countries lead to differences in their abilities to ensure food security and access to safe and nutritious foods. Here, we compare the countries over three dimensions – the methods used to target benefits; the effect of macroeconomic conditions on food assistance expenditures; and the effectiveness of food assistance programs in achieving their goals.

These comparisons are particularly timely for policymakers in both countries because their food assistance programs have undergone transformations in the past few years. In Mexico, general food subsidies have, for the most part, disappeared and been replaced with food assistance programs explicitly designed for low-income households. As part of this change, a new groundbreaking and innovative program, Progresa, has begun. In the United States, the structure of food assistance programs has not changed, but their role in the social safety net has taken on new importance. Previously, cash assistance recipients could receive aid for an indefinite time period, but now time limits are placed on recipients. Food assistance programs, however, do not have such time limits and therefore will play an even larger role as people lose eligibility for cash assistance or decide not to receive cash assistance due to the time limits.

We begin with a review of the five largest food assistance programs in Mexico: Progresa (Programa de Educación, Salud y Alimentación), DICONSA (Distribuidora Compañia Nacional de Subsistencias Populares (CONASUPO)), FIDELIST (Fideicomiso para la Liguidación al Subsidio de la Tortilla), LICONSA (Leche Industrializada CONASUPO), and DIF (Sistema Nacional para el Desarrollo Integral de la Familia). Five U.S. programs are also reviewed: the Food Stamp Program, the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), the National School Lunch and Breakfast Programs, the Emergency Food Assistance Program (TEFAP), and the Food Distribution Program on Indian Reservations.

In designing these programs, for a given amount of money, a country chooses methods of identifying recipients such that the intended beneficiaries receive aid while, at the same time, unintended beneficiaries do not receive aid. We show, theoretically, how a country can minimize these problems of "undercoverage" and "leakage" and then show how Mexico and the United States actually try to minimize these problems through the structure of benefits, the usage of nonhousehold based information, and the avoidance of negative incentives. The primary difference between the countries is in the use of geographic targeting. In general, Mexico first decides on particular areas to target benefits and then, within those areas, further targets low-income households. The United States, however, targets benefits based only on low-income status and does not use any geographic information.

By targeting benefits, the goal of food assistance programs is to reach those most in need. During recessions, the number of persons in need of such assistance generally increases. U.S. food assistance programs are countercyclical. That is, as the economy expands, food assistance expenditures decline and vice-versa. For Mexico, expenditures on the program appear to be neither counter- nor procyclical. Mexico's food assistance programs appear to be stable and not influenced by changes in GDP or inflation.

An important question for evaluations of any food assistance programs is: Do these programs improve the well-being of recipients? We first review studies showing that U.S. food assistance programs are effective in terms of alleviating food insecurity; enhancing nutritious diets; and increasing food consumption. We then estimate how poverty rates in both countries might be affected by the inclusion of food assistance programs. We first estimate poverty rates without food assistance and then compare these rates with those that include food assistance. In Mexico, food assistance programs do not reduce the incidence of poverty. By contrast, U.S. food assistance programs reduce poverty by about 10 percent. The level of benefits as a percentage of income is much lower in Mexico than in the United States, and a much higher percentage of eligible households receive benefits from food assistance programs in the United States than in Mexico.

A Comparison of Food Assistance Programs in Mexico and the United States

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Introduction

Food assistance programs in Mexico and the United States are integral components of these nations' social safety nets. About one in five Mexicans and one in six Americans receive benefits from at least one federally funded food assistance program. This assistance helps ensure that people, especially children, are food secure and have access to a safe and nutritious diet. These programs have been reorganized in recent years to reflect the countries' changing economies and policy goals.

Until recently, Mexico had universal subsidies for major food products such as corn tortillas. Tortillas are a staple of the Mexican diet, and government policy once ensured that everyone had access to this basic food. Similar policies subsidize the price of dahl in India and baguettes in France. In Mexico, these subsidies for the most part have disappeared and been replaced with food assistance programs explicitly designed for low-income households. Of particular interest is a new food assistance program, Progresa, which incorporates numerous insights from the development economics literature. As Progresa expands, it will replace the other food assistance programs.

Unlike Mexico, the U.S. food assistance programs have not undergone major changes in recent years, but their relative importance in the social safety net has changed. The Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA) transformed Federal welfare policy. The act replaced the Aid to Families with Dependent Children (AFDC) program with the Temporary Assistance for Needy Families (TANF) program. While AFDC was an entitlement program and matched State dollars with Federal dollars, TANF imposes time limits and work requirements on recipients and uses Federal block grants (based on previous AFDC spending levels) rather than matching funds. While PRWORA made large cuts in the Food Stamp Program (the largest U.S. food assistance program), its status as an entitlement program was maintained for almost all Americans, thus preserving the nutritional safety net for almost the entire population. This nutritional safety net (combined with the other food assistance programs such as the School Lunch Program and the Special Supplemental Feeding Program for Women, Infants, and Children (WIC)) will become especially important during the next recession and as time limits for TANF recipients are realized.

In this report, we begin with a brief review of the five largest food assistance programs in Mexico: Progresa (Programa de Educación, Salud y Alimentación), DICONSA (Distribuidora Compañía Nacional De Subsistencias Populares (CONASUPO)), FIDELIST (Fideicomiso para la Liguidación al Subsidio de la Tortilla), LICONSA (Leche Industrializada CONASUPO), and DIF (Sistema Nacional para el Desarrollo Integral de la Familia). Five U.S. programs, chosen because of their size and/or parallels with Mexican programs, are then reviewed: the Food Stamp Program, the Special Supplemental Nutrition Program for Women, Infants and Children (WIC), the National School Lunch and Breakfast Programs, the Emergency Food Assistance Program (TEFAP), and the Food Distribution Program on Indian Reservations.

Demographic, economic, and cultural differences between Mexico and the United States lead to different constructions of these food assistance programs. We analyze the differences and the similarities between the programs over three dimensions. First, we examine how beneficiaries are identified. After describing the targeting methods used in each country, we consider how the countries construct their programs in terms of the level of benefits, the uses of non-household-based information, and the avoidance of negative incentives. Second, we analyze the response of the programs to changing economic conditions. We show that while U.S. food assistance programs tend to be countercyclical (that is, as the economy expands, food assistance expenditures decline and vice-versa), Mexican food assistance programs appear to be neither counter- nor procyclical. Third, we examine the effect of the programs on individuals' well-being. We review the literatures in terms of the effects of food assistance programs on food insecurity, nutrition, food consumption, and poverty.

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Major Food Assistance Programs in Mexico

The principles guiding the development of food assistance programs in Mexico are found in the National Development Plan 1995-2000. The objectives of the plan are to promote equal opportunities and conditions of equality to ensure that the population enjoys individual and social rights; to raise the level of well-being and the quality of life; and to reduce poverty and social exclusion. The efforts are oriented toward the development of the productive capacity of individuals and communities and are directed toward the regions with the greatest development need.

The social development strategy has two approaches that are necessarily inter-related:

1. Universal access policies concerning education, health, social security, and housing.
2. Poverty reduction policies oriented toward the most vulnerable social groups and those whose living conditions prevent them from having access to the benefits of development.

One part of the plan is the Program to Overcome Poverty 1995-2000. The program seeks to reduce the incidence of extreme poverty in the medium term, giving priority to the regions and the groups that need it the most. Therefore, a series of comprehensive and complementary actions are proposed to support individuals and families during key moments of their life cycle to break the intergenerational transmission of poverty. To achieve this, the program is based on three fundamental policies: development of coordinated and relevant actions to increase the capacity of individuals and families; construction of basic municipal infrastructure; and encouragement of productive activities that increase income and employment. The goal is to integrate these policies sufficiently for a comprehensive strategy to overcome extreme poverty.

We now review the five largest food assistance programs in Mexico: LICONSA, DICONSA, DIF, FIDELIST, and Progresa. While DIF is an autonomous agency, the other four programs are in the Secretaria de Desarrollo Social (SEDESOL). Previously, LICONSA, DICONSA, and FIDELIST were in the Secretaria de Agricultura (SAGAR).[2]

LICONSA

The oldest existing Mexican food assistance program, LICONSA was started in 1965 to safeguard the health of children. The LICONSA program provides milk powder and liquid milk at subsidized prices to low-income families. In 1997, the milk program distributed 11 percent of total domestic milk consumption, benefiting over 2 million children in rural areas and 3.4 million children in urban areas. The distribution mechanism is through "cards" that entitle poor children living in marginal zones[3] to buy 4 liters of milk per child/per week at discounted prices. In Mexico City, the allowance is for 8 liters of milk. In 1998, the price of milk for program participants was 25 percent lower than the market price.

Beginning in 1991, LICONSA increased its coverage to children 12 years of age and younger in low-income families (children of up to 2 years of age can obtain infant formula). The program previously had served children 5 years of age and younger. LICONSA distributes milk through LICONSA agents, DICONSA stores, and private retail shops. LICONSA also supplies milk powder to DIF.

DICONSA

DICONSA was created in 1972 to distribute basic commodities (corn, beans, rice, sugar, corn flour), powdered milk (in cooperation with LICONSA), and tortilla products at subsidized prices to people living in marginal urban and rural areas. DICONSA's operations have grown significantly over time. In 1976, DICONSA operated 1,500 rural stores; by 1997, there were 23,344 DICONSA rural stores, benefiting 31.2 million consumers. Over 82 percent of total DICONSA sales take place in rural areas, and 18 percent occur in marginal urban areas and special programs.

In 1995, DICONSA's selling prices were 19 percent lower than market prices in rural areas, and 13 percent lower in urban areas. DICONSA also has a targeted program to directly subsidize the price of corn tortillas through preferential prices to close to 5 million low-income consumers.

DICONSA's programs also include the Rural Procurement Program to supply subsidized basic commodities in rural areas and the Urban Procurement Program (PAZPU) to supply basic commodities in the cities.

DIF

The National Scheme for the Integrated Development of the Family (DIF) began in 1972 and was designed to increase the nutritional intake and welfare of the poor. Currently DIF manages five different food consumption programs: the Food Rations Program (PRA), Food Assistance to Families Program (PASAF), Popular Kitchens and Integral Services Units (COPUSI), the School Breakfast Program, and the Community Breakfast Program.

The most important, the Food Rations Program, provides milk powder, corn tortillas, and beans to over 7.3 million individuals, half of whom are children. The Food Assistance to Families Program provides monthly food baskets to 1.7 million families in extreme poverty located in rural, indige-

[2] For a historical perspective on food assistance programs in Mexico, see Yañez-Zazueta, 1997.

[3] Marginal zones are defined as relatively poorer areas in Mexico.

nous, and marginal urban areas. The Popular Kitchens and Integral Services Units Program provides an "integrated package" of food, health, and educational services throughout the country to rural and indigenous populations; the program benefited 256,425 people in 1997. The School Breakfast Program provides free breakfasts to school children located in the poor districts of the four largest cities, and to elderly, destitute, and handicapped people in social assistance centers. In 1997, the program benefited 2.6 million school children per day with 20 percent of the breakfasts distributed in Mexico City. The Community Breakfasts Program provides free breakfasts to children under 5 years of age and expecting and lactating mothers in rural and indigenous areas with fewer than 1,000 inhabitants.

FIDELIST (Trust Fund for the Liquidation of the Tortilla Subsidy)

In 1984, CONASUPO created the tortibonos food stamp program, a targeted program to directly subsidize the price of corn tortillas at preferential prices to low-income families in urban areas. Until 1990, CONASUPO distributed tortibonos directly to 2.5 million families at prices below the official consumer price ceilings (50 percent lower than the retail price), principally through DICONSA retail stores in low-income urban neighborhoods.

In 1990, the tortibonos program was replaced by the Program to Subsidize the Consumption of Tortilla (Tortilla sin Costo), to provide 2.1 million low-income households with tortilla stamps to obtain 1 kilo of free tortillas per day from the tortilla manufacturer. The free tortillas distributed through this program represented 3 percent of the total annual corn consumption in Mexico and about 50 percent of the daily household consumption. In 1997, over 1.9 million kilograms of tortillas were distributed. To control the volume distributed through tortibonos and the allocation of subsidies, the program adopted the use of "smart electronic cards" in 1992, implemented through DICONSA's retail stores and the Trust Fund for Tortilla Subsidy Payments (FIDELIST). Since 1995, FIDELIST has been managed by SEDESOL (Secretaria de Desarollo Social).

Progresa

Progresa is the most recent food assistance program implemented by the Mexican Government. Initiated in 1997, it links food assistance to health and education programs. Currently benefiting over 400,000 urban and rural families in 12 States, the goal is for full coverage of the country within the next few years.

Progresa has three linked components:

1. Education

The Government provides scholarships and financial support for school supplies to encourage children to attend school. In addition, the Government plans to increase the coverage and improve the quality of education by training teachers and improving school equipment.

Scholarships are granted to each child in families covered by Progresa. The scholarships include school equipment or the financial support to obtain them and are given every 2 months throughout the school year. The higher the grade, the higher the amount distributed. Beginning in the first grade of secondary school, girls receive a higher allowance than boys. The scholarships are meant to ensure school attendance and to reduce the incentives to seek jobs at a young age or, in the case of girls, to do housework before completing their basic education.

2. Health

The coverage of health services is enhanced by equipping and training health-care providers. A basic free health services package is provided, and a nutritional supplement is given to all pregnant women and nursing mothers and to children less than 2 years old to decrease the number of undernourished children. Health self-care by the families is fostered through education and training in the areas of health, nutrition, and hygiene.

3. Nutrition

Financial support of 110 pesos per month is granted to the families to supplement their income. To help ensure that the money is used for food, this money is distributed to the female head of the household. This amount is indexed to inflation so the purchasing power remains the same. Through education and information, families are encouraged to spend this money in a manner that will yield the most improvement in nutrition and well-being. Beneficiaries must make compulsory visits to health services, and parents must attend health courses.

Major Food Assistance Programs in the United States

We now review five food assistance programs in the United States: the Food Stamp Program, WIC, the National School Lunch and Breakfast Programs, the Emergency Food Assistance Program (TEFAP), and the Food Distribution Program on Indian Reservations. In contrast with Mexico, where the food assistance programs are under SEDESOL (roughly the equivalent of the U.S. Department of Health and Human Services), all U.S. food assistance programs are funded by the Department of Agriculture (USDA). Food assistance programs were originally established, in part, to distribute surplus commodities and, hence, served an additional role of supporting U.S. farmers. While some food assistance programs directly support domestic agriculture by distributing surplus commodities (such as the TEFAP program, described below) or by stipulating that only commodities produced in the United States can be purchased (such as the School Lunch Program), most food assistance programs (including the largest one, the Food Stamp Program) serve this role only indirectly. Nevertheless, because these programs do increase food consumption, support for them among farmers and others in agriculture remains high and increases political support for the food assistance programs run by USDA.[4]

Food Stamp Program

The Food Stamp Program is by far the largest U.S. food assistance program, serving approximately 18.2 million individuals in 1999. Children are the primary recipients of food stamp benefits: over half of all food stamp recipients are children, and 60 percent of food stamp households include children. The modern version of the program began as a pilot project in 1961 and became a nationwide program in 1974. This cornerstone of food assistance programs works under the principle that everyone has a right to food for themselves and their families and, hence, with a few exceptions, this program is available to all citizens who meet income and asset tests. Participants receive either paper "coupons" or an Electronic Benefit Transfer card for the purchase of food in authorized, privately run retail food outlets selling food to participants and nonparticipants. While authorized stores may also sell nonfood products, food stamps cannot be used to purchase nonfood items such as soap, toiletries, household paper products, prepared foods, or medicines.[5]

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)

Nutritious supplemental foods, nutrition education, and referrals to other important health and social services are provided to low-income pregnant and postpartum women, infants, and children up to the age of 5 through the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). About 7 million people participate in WIC in any month: 3.8 million children, 1.9 million infants (under age 1), and 1.7 million women. WIC was established on a permanent basis in 1974. The types of food a woman can purchase with WIC coupons for her own or her children's consumption are restricted. To meet the needs of pregnant and lactating women and their children, the foods include iron-fortified infant formula and infant cereal, iron-fortified adult cereal, fruits and vegetable juices rich in vitamin C, eggs, milk, cheese, peanut butter, and dried beans and peas. These foods are generally high in protein, calcium, iron, vitamin A, and vitamin C, nutrients frequently lacking in the diets of the program's target population. Fewer food outlets accept WIC coupons than accept food stamps. About 46,000 merchants nationwide and some farmers markets are authorized to accept WIC coupons.

The National School Lunch and Breakfast Programs

The National School Lunch Program provides nutritionally balanced, low-cost or free lunches to children in kindergarten through 12th grade. Each school day, about 26 million children receive lunches through the program. The amount a child pays depends upon the child's household's income: about 45 percent receive free meals; 10 percent receive reduced-price meals; and 45 percent pay near-full price. The program was started in 1946 to encourage children's consumption of nutritious food and to provide an outlet for surplus commodities. To ensure the consumption of nutritious foods, schools must meet Federal nutrition guidelines. Approximately 17 percent of the total dollar value of food in school lunches comes from 60 different kinds of foods from agricultural surplus; the rest comes from vendors chosen by the schools. Virtually all public and nonprofit private schools (94,000) participate in the program.

The National School Breakfast program is a smaller, newer program. Each school day, about 7 million children receive breakfasts through the program, breakfasts designed to provide at least one-fourth of the daily recommended levels for protein, calcium, iron, vitamin A, vitamin C, and calories. As with school lunches, the amount a child pays depends on household income, but a much higher percentage of participants receive free meals: 80 percent receive free meals; 5 percent receive reduced-price meals; and 15 percent pay near-full price. The high percentage of students receiving free meals is partly a function of the program's larger presence in low-income schools. The program was made permanent in 1975. Like the National School Lunch Program, breakfasts must meet nutrition requirements, but the program does not mandate specific foods to be offered. Unlike

[4]For more on the increase in food consumption due to food stamps and its resultant effect on the agricultural sector, see Kuhn, et al., 1996.

[5]The information used in this and the following descriptions for U.S. food assistance programs can be found in various issues of *Food Review* and on the Food and Nutrition Service's home page, http://www.fns.usda.gov/fns/.

the lunch program, agricultural surpluses are not used. About 70,000 schools participate in the program.

The Emergency Food Assistance Program (TEFAP)

TEFAP is a Federal program that supplements the consumption of low-income households through the provision of free, healthful foods. In the course of a year, the program serves about 3.5 million households. In this program, food is purchased, processed, and packaged by the USDA, shipped to States, and then distributed to local organizations such as food banks and soup kitchens. The types of foods distributed include canned and dried fruits, fruit juice, canned vegetables, meat, poultry, fish, rice, grits, cereal, peanut butter, nonfat dry milk, dried egg mix, and pasta products. TEFAP began in 1981 with the goal of reducing Federal food inventories and storage costs by assisting the needy.

Food Distribution Program on Indian Reservations

This program distributes foods to low-income households living on Indian reservations and to Native American families living near reservations. About 123,000 families participate in the program in each month. This program is part of the Food Stamp Program, designed as an alternative for families without easy access to foodstores. Each month, a household receives a food package weighing between 50 and 75 pounds, containing meats, vegetables, fruits, dairy products, grains, and cereals. The USDA purchases and ships the foods through six State agencies and 94 Indian Tribal Organizations. These agencies distribute the food, determine applicant eligibility, and provide nutrition education in 218 Indian communities.[6]

[6]There are other assistance programs in the United States for low-income households. These include programs to help with housing (such as public housing projects and Section 8 housing), to help with medical insurance (Medicaid), and cash assistance programs (the largest is Temporary Assistance for Needy Families (TANF)). These programs affect food consumption by enabling households to reallocate money from other necessities like housing and through the provision of extra money which can be used for purchasing food.

Identification of Recipients

Countries with a limited amount of money allocated to improving the well-being of poor residents must design effective identification methods to ensure that benefits are distributed in the most cost-effective manner possible while still reaching the intended beneficiaries. The goals of food assistance programs can be many. Most food assistance programs are designed to improve nutrition and ensure that people have enough food to eat. These goals can lead to other results, including a redistribution of resources to poor households, an alleviation of the negative effects of economic downturns, and a population more aware of nutrition. There are also many other potential goals not directly related to food consumption including political stability and the reduction of agricultural surpluses. To compare the targeting programs of Mexico and the United States, we begin with a general theoretical framework that assumes one goal of food assistance programs is to alleviate food insufficiency.

Consider a country with a fixed amount of money, T, for nutrition programs. The country gives food assistance through a vector of transfers, **t**, to all or some residents.[7] The extent of food insufficiency is measured by a food sufficiency index, F(**y**; z) where **y** is a vector of food consumption levels for all households and z is a minimum food consumption level below which households are defined as malnourished. The food sufficiency index could be constructed in a manner similar to poverty indexes (for example, the Foster, Greer, and Thorbecke measure (1984); Sen's poverty index (1974)).

If the y_i's are observed, a country faces the following minimization problem:

$$\min F(\mathbf{y}+\mathbf{t};z) \text{ subject to } \sum_i t_i \le T,$$

where the t_i's are the elements of **t**. The solution to this problem is

$$\mathbf{t}_p^* = \mathbf{t}(\mathbf{y},z,T).$$

and each household, taking z and T as fixed, will receive the transfer, $t_{pi}^* = t(y_i)$.[8] This is called perfect targeting at the household level.[9]

In most cases, however, perfect targeting is not possible. In response, countries will minimize expected food insufficiency with a vector of observable variables, **x**, that are correlated with y. The new minimization problem is then

$$\min E[F(y+t;z)] \text{ subject to } \sum_i t_i \le T, \text{ given } f(y|\mathbf{x}) \text{ and } \mathbf{X}$$

where the matrix **X** is the set of observations on **x** for all households in the population. The general solution to this can be represented by a functional **t***:

$$\mathbf{t}^* = \mathbf{t}(\mathbf{X}, z, T),$$

which, for a given z and T, can be simplified to

$$\mathbf{t}^* = \mathbf{t}(\mathbf{X}).$$

Any household with observed characteristics, $\mathbf{x}_i$, will receive the transfer $t_i^* = t(\mathbf{x}_i)$. The vector **t*** will minimize the expected food insufficiency level in the country.

Neither Mexico nor the United States (nor any other country for that matter) is able to perfectly target transfers to households using the function $t(y_i)$ and both instead use $t(\mathbf{x}_i)$. In choosing $t(\mathbf{x}_i)$, countries consider the relative benefits and costs of various plans (see Grosh, 1994, p. 7-14). These benefits and costs are measured in terms of leakage and undercoverage. Leakage occurs when transfers are received by households that are not in need of assistance (as defined by the goals of the program). Undercoverage occurs when transfers are not received by the intended households.

The benefits to targeting are relatively obvious in terms of the theoretical structure above: for a fixed T, a country can most effectively improve the well-being of poor households by concentrating resources on those most in need. Conversely, once a country decides on who should be receiving assistance, identifying them accurately helps a country minimize the amount of T needed to achieve its goal.

There are four main costs to targeting.[10] First, there are administrative costs to identifying eligible households not present with universal food subsidies (i.e. food assistance benefits that are available to everyone without restrictions). Second, there are costs borne by recipients in applying for a subsidy. For example, the cost in time to negotiate the application process; the financial cost of getting to the welfare office; and the opportunity cost of lost wages when applying for benefits. Third, households may change their behavior in response to the identification criteria. A household just above the eligibility cutoff in terms of income, for example, would qualify for the program if the earners in the house-

[7] Our theoretical framework is similar to Glewwe, 1992. Consistent with papers in the poverty alleviation through targeted benefits literature, he uses poverty as defined through income deficits from a poverty line. Because the usual concern with food assistance programs is to ensure that people have enough food to eat and are well-nourished, we examine the alleviation of food insufficiency in this report. Other concepts such as undernutrition could be used instead. For more on targeting of support to low-income households, see Székely, 1997; de Walle and Nead, 1995; Ravallion, 1989; Ravallion and Chao, 1989; and Besley and Kanbur, 1988.

[8] It is possible that for some households, $t_{pi}=0$. In fact, for the programs discussed below, this is the case.

[9] Perfect targeting at the household level does not imply perfect targeting at the individual level. There may be individuals in ineligible households in need of assistance. Even if the intended households receive the benefits, due to intra-household allocation decisions, not everyone in the household may receive the benefits in the intended amounts. (See Lundberg and Pollak, 1996, for more on the implications arising from intra-household bargaining.)

[10] Analyses of food assistance programs in Egypt (Ali and Adams, 1996) and Jamaica (Jacoby, 1997) have found that universal subsidies can achieve similar outcomes as targeted subsidies. This can occur if, for example, the program provides "inferior foods" that nonpoor persons are less likely to consume. Neither Mexico nor the United States uses universal subsidies, so we do not consider the relative efficacy of universal versus targeted programs.

hold scaled back the number of hours they worked. While this improves the household's welfare by increasing the leisure time of wage earners, such households were not the intended beneficiaries when the government established the eligibility criteria. In response, the government is therefore forced to spend more money than it would have otherwise and/or cut back on the number of recipients. Fourth, when geographical targeting is used, some nonrecipients may move into the targeted area so as to receive benefits. This outcome may have desirable features insofar as otherwise poor nonrecipients are now covered, but if nonpoor households also move into the targeted area to receive benefits, the Government may be forced to reduce the amount available to poor households and/or to increase the cost of the program.

A country's choice of t(**x**) and T is clearly influenced by its available resources. The United States is much wealthier than Mexico. Based on current exchange rates, the per capita 1997 U.S. gross domestic product (GDP) was $29,326, while it was $4,298 in Mexico. Using purchasing power parity prices, the gap narrows somewhat: $29,326 versus $7,697. The United States, therefore, if it is so inclined, has a lot more money available for food assistance programs. This additional income means that more sophisticated targeting methods t(**x**) are possible and T can be larger. This should be noted as we now review how t(**x**) is chosen for the three largest U.S. food assistance programs and for the Mexican food assistance programs.

U.S. Food Assistance Programs

Food Stamp Program

Households have to meet three financial criteria to qualify for the Food Stamp Program: the gross income test, the net income test, and the asset test. A household's gross income before taxes in the previous month must be at or below 130 percent of the poverty line ($1,479 per month in fiscal year 1999 for a three-person household, the most common food stamp household). Households with disabled persons or headed by someone over the age of 60 are exempt from this test (although they must still pass the net income test). After passing the gross income test, a household must have a net monthly income at or below the poverty line. Net income is calculated in the following manner. A standard deduction is subtracted from a households' gross income. Households with earnings from the labor market deduct 20 percent of these earnings from their gross income. Households incurring expenses for child care and/or care for disabled dependents can deduct up to some limit. A medical deduction for expenses above $35 per month and a shelter deduction for costs in excess of 50 percent of a household's net income (computed before the shelter deduction) are also used. (The medical deduction is only available to households with elderly or disabled members.) The shelter deduction is capped except for elderly or disabled households. Finally, net-income-eligible households must meet an asset test. All net-income-eligible households with assets less than $2,000 qualify for the program ($3,000 for households headed by someone over age 60). The value of a vehicle above $4,650 is also considered an asset unless it is used for work or for the transportation of disabled persons. The value of a home is not considered an asset.

Recipients of food stamps are categorically eligible for WIC and the School Lunch and Breakfast programs, if they also meet the other nonincome requirements of the program. As seen in the income eligibility tests of these other programs, the converse does not hold.

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)

To qualify for WIC, three criteria must be met. First, individuals must fall into one of four categories: pregnant woman, postpartum woman, infant under the age of 1, or child between the ages of 1 and 4. Second, gross household income in the previous month must be less than 185 percent of the poverty line. Participants in the Food Stamp Program or Medicaid are automatically income eligible. Third, recipients must be nutritionally "at risk." Two major types of nutritional risk are recognized: medically based risks (such as anemia, underweight, maternal age, history of pregnancy complications, and/or poor pregnancy outcomes) and diet-based risks such as an inadequate dietary pattern. This assessment, based on Federal guidelines, is made by a health professional, that is, a physician, nutritionist, or nurse.

Unlike other U.S. food assistance programs, WIC is not an entitlement program and, therefore, funding may not be available so that all eligible persons can receive benefits. Once a local WIC agency has spent all its funds, rationing occurs based on the following priority levels (in descending order): pregnant women, breast-feeding women, and infants determined to be at nutritional risk because of a nutrition-related medical condition; infants up to 6 months of age whose mothers were at nutritional risk during pregnancy; children at nutritional risk because of a nutrition-related medical condition; pregnant and breast-feeding women and infants at nutritional risk because of an inadequate dietary pattern; children at nutritional risk because of an inadequate dietary pattern; and nonbreast-feeding, postpartum women at nutritional risk.

The National School Lunch Program

Any student at a school participating in the School Lunch Program can receive free or reduced-price lunches. About 92 percent of all students have access to these meals with near universal access in public schools. Children from households earning less than 130 percent of the poverty line can receive free meals; children from households earning between 130 and 185 percent of the poverty line can receive meals for 40 cents; and households earning more than 185 percent of the poverty line do not receive any reduction in the cost (although even these meals are subsidized to some extent due to the use of surplus agricultural foods).

As seen in the age requirements for this program and WIC, it is very unlikely that a child could receive benefits from both programs. However, a family can potentially receive benefits from both programs.

Mexico's Food Assistance Programs

LICONSA

Children under the age of 12 who live in families with incomes below 2 times the minimum salary (a commonly used poverty line in Mexico) qualify for subsidized milk in the LICONSA program. The participation of over 10,900 dairies ensures milk availability.

DICONSA

DICONSA's target population is families with incomes of less than 2 times the minimum salary living in rural communities of less than 2,500 inhabitants whose residents (a) request assistance and (b) have the majority of the population with incomes below two-times the minimum wage. Access to this program for the distribution of basic commodities is facilitated through 23,000 stores, 332 warehouses, and 3,400 vehicles for distribution and supervision.

DIF

Everyone residing in a targeted community qualifies for the benefits of DIF. Targeting of DIF depends on an "index of social vulnerability" composed of five components — (1) infant mortality rates, (2) illiteracy rates, (3) malnutrition rates, (4) the number of indigenous persons in an area, and (5) the number of postpartum women who are unable to breast-feed. To establish the index, DIF first uses official statistics, then DIF agents talk with local officials to establish the statistics' veracity. The goal is to reach the most poverty-stricken households; so areas scoring highest on this index are served by DIF.

FIDELIST

Families earning less than two times the minimum salary and without a telephone or car qualify for FIDELIST.

Progresa

The selection process of beneficiaries for Progresa is determined by income and other factors, a process clearly stated in the program's guidelines. A household is defined as a group of people (related or unrelated) living in the same house, sharing food expenses, and cooking in the same kitchen.

The identification of beneficiaries of Progresa is carried out in three stages. The first consists of a geographic targeting process to determine the most marginal localities with relatively easy access to health services and schools. Second, a census of socioeconomic information of each household in all the selected localities is carried out to identify the beneficiaries of the program. Third, once the list of beneficiaries is completed, it is presented to the communities in meetings to rectify any improper inclusion or exclusion of beneficiaries.

The geographic targeting process is based on the Indice de Marginación. The index is based on, for any region, the percentage of illiterate population age 15 or more; the percentage of households without water services, drainage, electricity, or floors; the average number of inhabitants per room in households; and the percentage of the population employed in the primary sector (mainly manufacturing and services industries).

The second step in the targeting process is based on the analysis of socioeconomic information of each household in the regions selected by the Indice de Marginación. Beneficiaries must also be considered poor. The information obtained through the socioeconomic census of each household was designed to include measures of poverty. These variables are household structure, individual characteristics, occupation, income of each member of the household, government support programs received by the members of the household, migration, health of the members of the household, physical characteristics of the house, use of the land, and the number of farm animals.

The consolidation of the list of eligible households by locality takes place in a community meeting attended by the female head of the household and other members of the community. The input of the community in determining the final list of beneficiaries is important and ensures that all eligible households are included.

During this community meeting, the basic guidelines are reviewed as well as the responsibilities of the beneficiaries, such as compulsory visits to the health center and children's school attendance. The community is in charge of the control and surveillance of the program. The benefits of Progresa can be suspended temporarily or permanently if the beneficiaries do not fulfill their responsibilities. After 3 years, people may be rotated off the program to allow other community members to participate.

The objective of targeting is to ensure that the poorest families receive the benefits. Because financial resources for food assistance programs are insufficient to reach all households living in extreme poverty, the Government ensures that Progresa does not overlap with other Government food and education support; so beneficiaries of Progresa cannot participate in other food assistance programs. This rule is consistent with the goals of the Mexican Government. As Progresa expands, it is going to replace the other programs. In other words, the other programs are not going to be able to replace beneficiaries lost to Progresa by going to other parts of the country not served by Progresa or by changing their eligibility criteria to include more families. Poor households who receive no benefits from Progresa could theoretically receive benefits from the four other programs. The extent of overlap is unknown.

A Comparison of Programs Over Three Dimensions

We now compare Mexican and U.S. food assistance programs over three dimensions related to targeting: (1) the structure of benefits, (2) the uses of nonhousehold-based information for targeting, and (3) the possible negative incentives produced by the programs.

Structure of Benefits

In Mexico, once a family is deemed eligible for food assistance, its level of benefits is fixed. In the United States, the amount of assistance a family receives for WIC, TEFAP, and the Food Distribution Program on Indian Reservations is also fixed. The benefits under the National School Lunch and Breakfast Programs and the Food Stamp Program, however, are inversely related to income, although for the former, there are only three income categories. In terms of the theoretical structure above, if $t_i(\mathbf{x}_i)^* > 0$, then $t_i(\mathbf{x}_i)^*$ is independent of $\mathbf{x}_i$ for the fixed-benefit programs; for the other programs, if $t_i(\mathbf{x}_i)^* > 0$, $t_i(\mathbf{x}_i)^*$ depends on $\mathbf{x}_i$.

A fixed benefit level reduces the administrative cost of targeting because the only information needed is whether or not a household is eligible. For example, Mexico has no need to know whether a household without a car or telephone earns 1 or 1.5 times the minimum wage—in both cases a household qualifies for FIDELIST. However, for the U.S. Food Stamp Program, for example, greater detail is needed to set the benefit level. While the need for greater detail does increase the administrative costs, there are two primary advantages to using a benefit level inversely related to, say, income. First, the marginal benefit to a peso of assistance is, under reasonable assumptions, higher for households with incomes far below the poverty line than those closer to the poverty line. In other words, it is a more efficient way to allocate scarce resources. Second, the disincentive effects of a variable benefit level are lower than for a fixed benefit level. Consider an ineligible individual who, with a small decrease in the number of hours worked, will become eligible. If there is a fixed benefit level, a small decrease in the number of hours worked may actually lead to a higher total income. If there is a properly constructed variable benefit level, however, a small decrease in the number of hours will not lead to a higher total income.

Uses of Nonhousehold-Based Information

In the theoretical framework above, we presumed that households were the intended beneficiaries of food assistance programs, and, with the exception of DIF, programs in both countries use at least some information at the household level to identify beneficiaries. However, in both countries, the vector $\mathbf{x}$ can also include information not necessarily at the household level.

Some programs use more disaggregation to identify beneficiaries by targeting benefits to individuals within households. WIC does use the income of households to identify eligible recipients, but it also uses information about the women, infants, and/or children within the households who are potential beneficiaries. For example, nutritional risk is an eligibility criterion for the women, infants, and children. Others in the household could be at nutritional risk, but they are not eligible. U.S. school meal programs use household income to decide on the cost of meals, but only school-age children in schools are eligible for benefits. In Mexico, Progresa's scholarship program is for school-age children, and its benefits are further targeted by gender with girls receiving more benefits than boys. LICONSA targets benefits to children under the age of 12. This further disaggregation allows for more precision in reaching the intended beneficiaries. All members of households benefit insofar as money previously spent on now-covered expenses is freed up for other expenditures.

Unlike the United States, Mexico uses information aggregated beyond the household level to identify beneficiaries. All food assistance programs in Mexico use some geographic targeting. By using more aggregation, the administrative costs of providing food assistance is decreased in at least two ways. First, by screening out large categories of persons, the cost to certifying the eligibility of a smaller number of potential recipients is lowered. For example, Progresa first decides on what areas are most in need of assistance and, after this decision, individuals are targeted. This method reduces the costs of ascertaining eligibility for the Government. Second, the costs to providing the services themselves are lessened. Consider the case of DICONSA, which incurs both capital and labor costs. By restricting the benefits to limited areas, the capital investment is diminished because the Government does not have to establish and staff stores in all locales. The costs to families can also be less. Suppose the Government, instead of targeting geographically, decided instead to establish the same number of DICONSA stores distributed randomly across the country. This alternative location strategy would lead to an increase in travel and opportunity costs for the average poor family.

While there are advantages to geographic targeting, the primary disadvantage is the undercoverage that occurs because needy individuals not in the targeted area will not receive benefits. Simulations for Mexico show that if only State-level information is used, the undercoverage rate is 59.3 percent; if municipal information is used, it is 42.3 percent; and if locality information is used, it is 37.3 percent (Baker and Grosh, 1994; table 7). By no means should these be interpreted as the actual extent of undercoverage: they are based on data from 1984; Mexico uses more than just geographic targeting; and the simulations presume a fixed amount of money available to poor households – but that fixed amount of money is not based on the actual amount of money available. Thus, these simulations should be seen as only an indication of the relative effectiveness of hypothetical targeting schemes.

Compared with the United States, poverty in Mexico is more concentrated in rural areas. This concentration is the primary reason that most programs in Mexico use the urban/rural distinction to target benefits more extensively

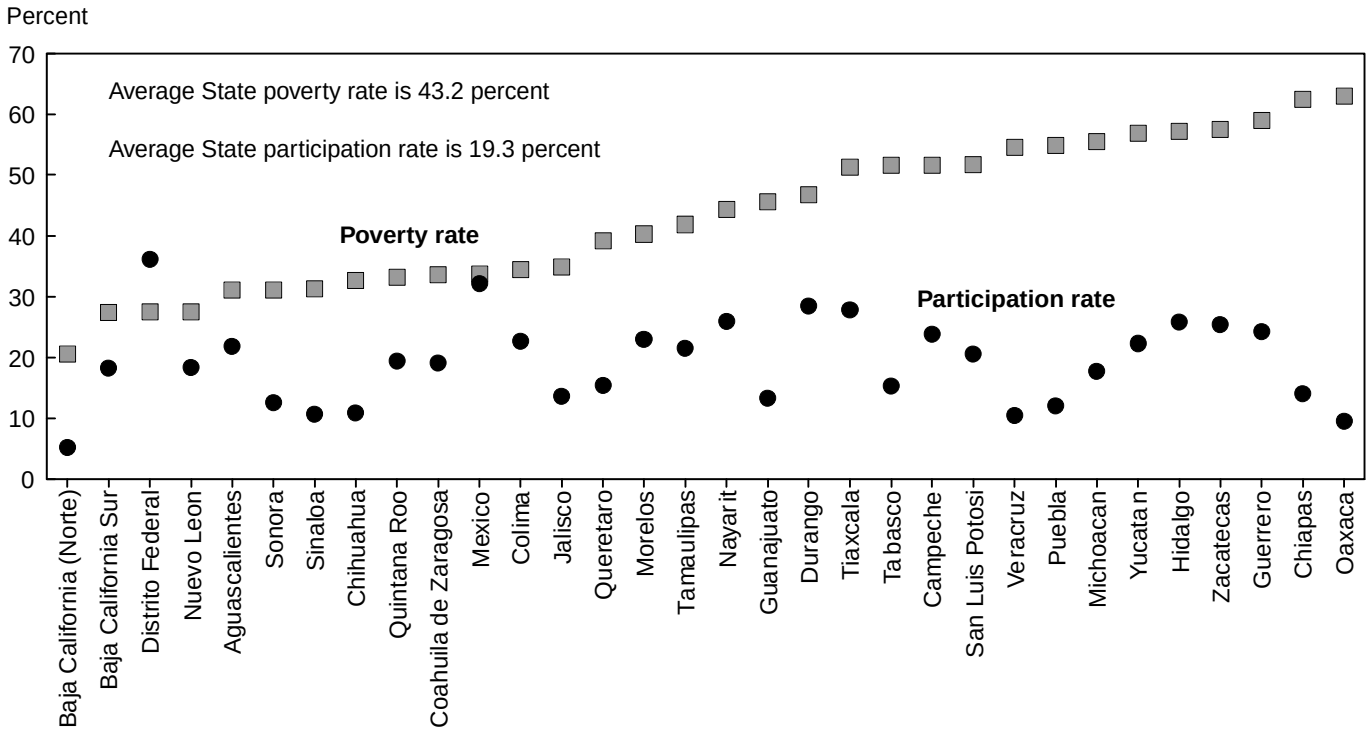
than the United States. About 4.2 million Mexican households live in extreme poverty conditions.[11] Of those poor households, 1.7 million are in urban areas and 2.5 million in rural areas. Because the distribution of Mexico's population between urban and rural areas is 73 percent in the cities and 27 percent in rural areas, poverty is much more common in rural areas. (For more on the rural/urban poverty differential, see Kelly, 1999.) In the United States, poverty is more evenly distributed. The poverty rate for persons outside metro areas was 15.9 percent in 1997 versus 12.6 percent inside metro areas (Dalaker and Naifeh, 1998). Using nongeographical distinctions one can see sharp disparities between groups in poverty rates, however. For example, single mothers with children have a poverty rate of 31.6 percent, while married couples with children have a poverty rate of 5.2 percent. While the United States has not targeted food stamp benefits based on these nongeographical distinctions, it has structured access to food assistance programs based on this information. For example, prior to PRWORA, recipients of AFDC, a program for single parents with children, were categorically eligible for food stamps. As a consequence, they did not have the burden of establishing income eligibility for food stamps.

The relation of the food assistance participation rate to the poverty rate by State is one way to view the effectiveness of a country's targeting methods. The poverty rate and the participation rate are displayed by State for Mexico in figure 1.[12] The States are in ascending order of poverty. There appears to be very little connection between State poverty rates and food assistance participation. For example, in Oaxaca, a State with a poverty rate of 63 percent, only 9 percent of residents participate in at least one food assistance program. Conversely, in the Distrito Federal, a State with a relatively low poverty rate of 28 percent, 36 percent of residents participate in at least one food assistance program. We provide a more detailed look at the targeting methods used in the food assistance programs in the section on "Food Assistance and Poverty Rates" below.

[11]Extreme poverty is defined as not having enough resources for access to the goods contained in the official list of basic products that allows for the adequate performance of daily activities.

[12]For a discussion of how the participation and poverty rates were calculated and the information source used for this analysis (Instituto Nacional de Estadistica Geografia e Informita, 1997) see Gundersen and Kelly, 1999. The participation rate is calculated as the percentage of households participating in at least one food assistance program. Appendix A has a table for all States in Mexico. Appendix B has a table for all the United States.

Figure 1
Mexican food assistance participation rates and poverty rates, 1995, by State



Note: See appendix A for more detail.

Source: Conteo de Poblacion y Vivienda.

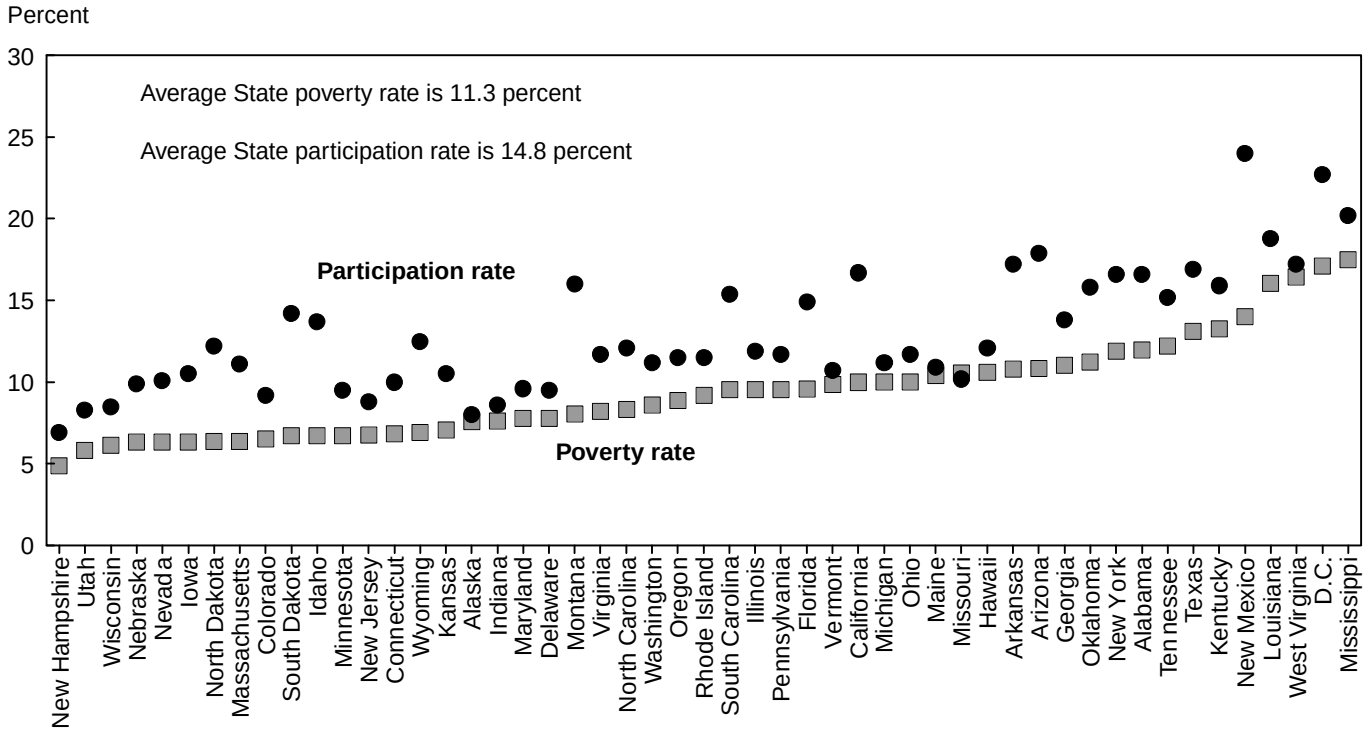
A similar exercise for the Food Stamp Program in the United States is in figure 2. There are two major differences between the United States and Mexico in terms of the food assistance/poverty relation. First, the difference in poverty rates across States is much less in the United States, from 5 percent in New Hampshire to 18 percent in Mississippi whereas in Mexico the range is from 21 percent in Baja California (Norte) to 63 percent in Oaxaca. Second, while not exact, food stamp participation rates appear to be more correlated at the State level with poverty rates in the United States. This closer correlation between poverty rates and food stamp participation rates in the United States may be due to three reasons. First, food stamps are an entitlement program, while none of the food assistance programs in Mexico are entitlement programs. Second, the costs to reach some of the poorest areas in Mexico are very high due to underdeveloped transportation systems. As a consequence, administrators of food assistance programs may decide not to serve such areas because the marginal costs of serving them exceed the marginal benefits. In the United States, transportation systems are well-developed and therefore are not an issue. Third, Mexico has a large number of subsistence farmers, especially in very poor rural areas. While these farmers may be in dire need of other social services, food assistance may not be needed to the same extent as in areas without subsistence agriculture. Food assistance administrators may therefore decide not to serve these areas. The number of subsistence farmers in the United States is negligible.

Negative Incentives

A government generally hopes that the vector of characteristics, $\mathbf{x_i}$, for any household i is not affected negatively by the targeting method, $t(\mathbf{x_i})$; but that occasionally happens nonetheless. Examples of changing characteristics to receive benefits include moving to a certain area to receive benefits (when geographic targeting is used); cutting back on the number of hours worked (when income cutoffs are used); and increasing family size to receive more benefits (when family size influences the size of benefits).

In Mexico, there is no published evidence of and little concern about families that changed behavior to receive food assistance benefits. In the United States, however, policymakers are concerned about the possible negative incentives associated with welfare, including food stamps. The recent Personal Responsibility and Work Opportunity Reconciliation Act was designed, in part, to reduce the negative incentives seen by some as the source of extended welfare stays for portions of the population. Through the TANF program, the entitlement nature of AFDC ended. The act limits cash assistance benefits to 5 years total in an individual's life

Figure 2
U.S. food stamp participation rates and poverty rates, 1995, by State



Note: See appendix B for more detail.

Source: U.S. Dept. of Comm., Census, and U.S. Dept. of Agr., Food and Nutrition Serv.

and, through the increased autonomy given to States, States can impose even stricter requirements — as little as 2 years of receiving assistance. States also impose various rules limiting benefit levels for additional children, thus reducing the supposed incentives for mothers to have more children to qualify for higher benefits. The Food Stamp Program remains a federally funded entitlement program, however, with time limits on receipt for only a small portion of eligible persons – able-bodied adults without dependents who do not work or participate in an employment training program and who do not live in an area with high unemployment rates or in a labor surplus area.

Despite concern by policymakers, research has found that the negative incentives associated with U.S. welfare programs have a very small effect on the number of recipients and the size of families. While hours of work were lower than they would have been in absence of AFDC benefits, the disincentives to work were calculated to have led to about a 5-percent increase in the AFDC caseload (Moffitt, 1992; p. 17).[13] Over time, the number of single-parent households has increased. However, despite the claims of some policymakers, this increase cannot be attributed to the AFDC program (Moffitt, 1992; p. 29). Relatively less work has been done on the effect of the Food Stamp Program on labor supply and/or family size.[14] Fraker and Moffitt (1988) found that elimination of the Food Stamp Program would lead to an estimated 9-percent increase in the number of hours worked by female heads of households. A study of married couples (Hagstrom, 1996) found that increases in food stamp benefits produce almost no change in the number of hours worked, although they do induce higher participation levels.

Countries can also choose targeting methods that may indirectly induce positive changes in individual or household characteristics. For example, Progresa requires medical checkups as a condition of receipt, and WIC recipients are strongly encouraged to seek prenatal care. The effects of these indirect influences on recipients' well-being is an area in need of more research.

[13]A decline in hours of work is not necessarily a negative outcome: this allows single mothers to spend more time caring for their children. In fact, the original intent of AFDC was to ensure single mothers did not have to work outside the home.

[14]On a per person basis, other food assistance programs are probably too small to produce labor supply changes.

Effect of the Macroeconomy

By ensuring that low-income households have enough food to eat, food assistance programs are an important component of the social safety net in both countries. For purposes of this report, we are concerned with two roles of the safety net. For households that are persistently poor, even during economic expansions, the safety net ensures them a minimum standard of living. In the United States, approximately one in three poor households have permanent incomes that lead to poverty in every year of a 10-year time horizon (Rodgers and Rodgers, 1992). This "chronic poverty" is particularly high for certain segments of the population, for example, households headed by single African-American mothers without a high school diploma. These households have a chronic poverty rate of close to 70 percent.[15] A comparable situation appears to exist in terms of race/ethnicity in Mexico. Areas with high concentrations of indigenous persons have less than one-fourth the average incomes of areas with low concentrations. The chronic nature of this poverty is reflected in the low human capital levels as proxied for by literacy rates. In indigenous areas, 48 percent of households are literate versus 76 percent in other areas. The chronic nature is also reflected in the quality of residential amenities – in indigenous areas, 16.1 percent of households have piped water versus 62.5 percent in other areas; 48.9 percent have electricity versus 92.9 percent; and 2.2 percent have a telephone versus 22.2 percent (Panagides, 1994, table 7.1, table 7.4, and figure 7.5).

[15]This study was based on data from 1977 to 1986.

A second role of the social safety net is to protect families that fall below the poverty line during economic recessions.[16] During an economic recession, the average income in a country declines. While, in theory, an increase in poverty does not necessarily occur if the relative distribution of income in a country stays the same or becomes more unequal, a falling average income does lead to an increase in poverty.

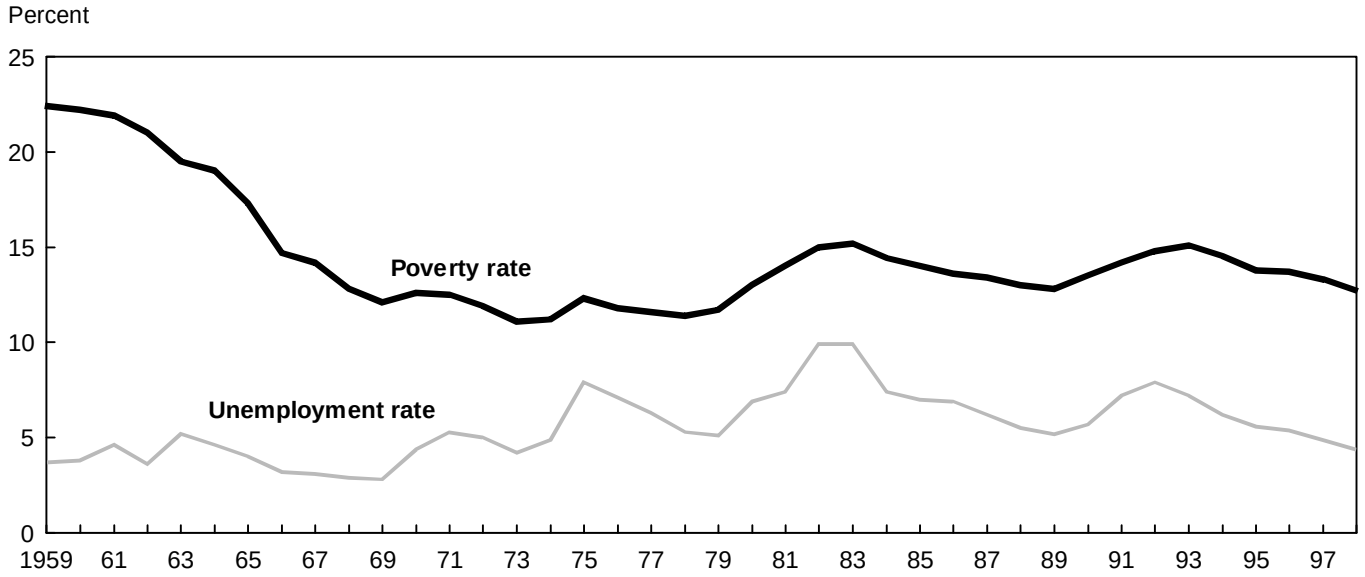
This inverse relation between poverty and the state of the macroeconomy in the United States can also be seen in figure 3, which shows the poverty rate and the unemployment rate (as economic growth declines, the unemployment rate increases) from 1959 onwards. For example, during the prolonged expansion of the 1960's, there was a steady decline in the poverty rate, and during the recession of the early 1990's, there was an increase in the poverty rate.[17] There has been extensive work done on the relationship between the macroeconomy and the poverty rate. (See, for example, Blank, 1993; Blank and Blinder, 1986; Blank and Card, 1993; and Cutler and Katz, 1991.)

Poverty rates and participation in welfare programs are generally closely related. However, poverty rates may change without any changes in participation rates or vice-versa. For example, a large number of eligible households do not participate in the U.S. Food Stamp Program (Cody and Trippe, 1997). In recent years, several researchers have analyzed the

[16]A safety net will also help a family facing a transitory income shock unrelated to the macroeconomy. For example, a spouse's departure (abandonment, death, divorce) from a family may lead to a temporary decline in the family's income.

[17]According to Gottschalk and Danziger, 1985, a large portion of this decline is also due to increased transfer payments over this time period.

Figure 3
U.S. poverty rates and unemployment rates, 1959-98



Source: U.S. Dept. of Agri., Food and Nutrition Serv.

effect of the macroeconomy on welfare caseloads in the United States. This work has emerged, in part, to try to answer the following question: Which has the larger effect on the unprecedented decline in cash assistance caseloads – various State-based welfare reform policies or the macroeconomic expansion? Some have argued that welfare reform is a very important factor (Executive Office of the President, 1997; Blank, 1997) while others have argued that economic growth swamps any influence of welfare reform (Ziliak, Davis, and Connolly, 1997; Martini and Wiseman, 1997).[18]

This work was inspired by the dramatic caseload reductions in cash assistance programs. An even greater decline has occurred since 1994 in the Food Stamp Program. From a record high of 27.5 million in 1994, the number of food stamp recipients fell by more than 30 percent to 18.0 million by mid-1999. A recent analysis by Figlio, Gundersen, and Ziliak (2000) examined the relative contributions of the macroeconomy and welfare reform to this decline by using dynamic and static models with data from all 50 States and the District of Columbia for fiscal years 1980 to 1998.[19] In their preferred dynamic model, the effect of the welfare reform variables are very small compared with the effect of the macroeconomic variables. From 1994 to 1998, approximately 35 percent of food stamp caseload change is due to State differences in macroeconomic conditions (unemployment and employment-growth rates), while a very small fraction is attributable to State-to-State differences in welfare reform. State-level political factors account for about 15 percent of the caseload decline. Their work implies that a reversal of economic fortunes will likely lead to a substantial increase in food stamp cases. (Other research looking at the effect of the macroeconomy on food stamp caseloads include Kuhn, LeBlanc, and Gundersen, 1997; Wallace and Blank, 1999; and Dynarski, Rangarajan, and Decker, 1991.)

These studies were primarily concerned with the determinants of caseloads. In this report, we analyze the effect of the macroeconomy on food assistance expenditures in Mexico and the United States. Caseload dynamics is one of the two factors influencing changes in food assistance expenditures. The other factor is the change in the average benefit level. While we use econometric techniques to analyze the effect of the macroeconomy on food assistance expenditures in United States, the lack of information about food assistance expenditures before 1989 prevents a similar exercise for Mexico.

Total real annual food assistance expenditures in the United States from 1970 on is seen in figure 4 (the expenditures are deflated by the Urban Consumer Price Index (CPI-U)). Figure 5 shows the unemployment rate and total real food assistance expenditures. With a few exceptions, increases in unemployment apparently coincide with increases in food assistance expenditures. Using models akin to those used in Kuhn, LeBlanc, and Gundersen (1997), we then isolated the effect of various macroeconomic forces on food assistance expenditures. The two models we used are

$$(1)\quad \log FAEXP_t = \beta_0 + \beta_1 \log FAEXP_{t-1} + \beta_2 UN_t + \beta_3 UN_{t-1} + \beta_4 INFL_t + \beta_5 t + \varepsilon_t$$

and

$$(2)\quad \log FAEXP_t = \alpha_0 + \alpha_1 \log FAEXP_{t-1} + \alpha_2 \Delta GDP_t + \alpha_3 \Delta GDP_{t-1} + \alpha_4 INFL_t + \alpha_5 t + \varepsilon_t$$

where logFAEXP is the log of real food assistance expenditures (discounted by the Consumer Price Index - Urban (CPI-U)); UN is the male unemployment rate; INFL is the inflation rate; ΔGDP is the change in real GDP; and t is time. We restricted our choice of variables and frequency of observation (annual) such that comparable models to study the effect of the macroeconomy on food assistance expenditures in Mexico were possible.

The results are in table 1. In model 1, the health of the macroeconomy is measured by the unemployment rate. The combined effect of lagged and current unemployment implies that a 1-percent increase in the unemployment rate leads to a 9-percent increase in food assistance expenditures after 2 years. Consistent with the work on food stamp participation, inflation is also positively associated with food stamp expenditures. The steady increase in expenditures seen in figure 5 is reflected in the importance of the year variable.

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[18]Figlio and Ziliak, 1999, find that the primary difference in these conclusions is attributable to the types of models used. Once the dynamics of caseloads is incorporated into models, the role of welfare reform is sharply reduced relative to the macroeconomy.

[19]The static model is expressed as

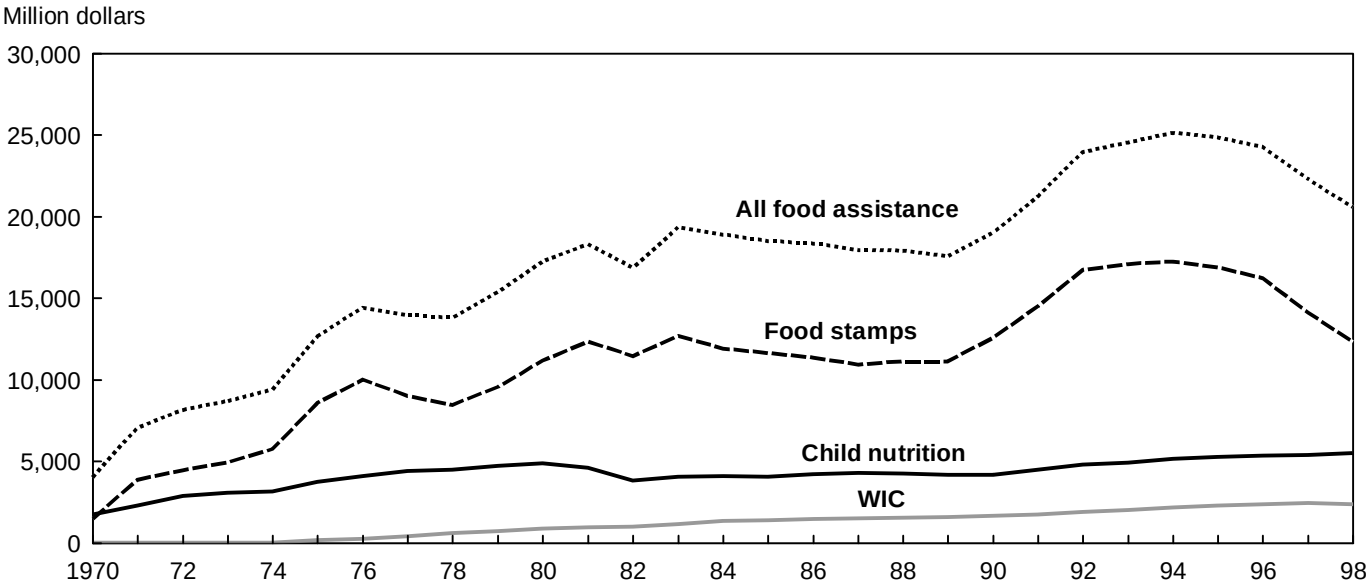
$$C_{it} = \mu + \alpha UR_{it} + \iota EMP_{it} + \beta W_{it} + \theta B_{it} + \eta ABAWD_{it} + P_{it}\varphi + \xi EBT_{it} + \gamma_t + \delta_i + \lambda_i t + \varepsilon_{it}$$

and the dynamic model is expressed as

$$C_{it} = \mu + \sum_{s=1}^{s} \rho_s C_{it=s} + \sum_{j=0}^{J} \alpha_j UR_{it-j} + \sum_{k=0}^{K} \iota_k EMP_{it-k} + \beta W_{it} + \theta B_{it} + \eta ABAWD_{it} + P_{it}\varphi + \xi EBT_{it} + \gamma_t + \delta_i + \lambda_i t + \varepsilon_{it}$$

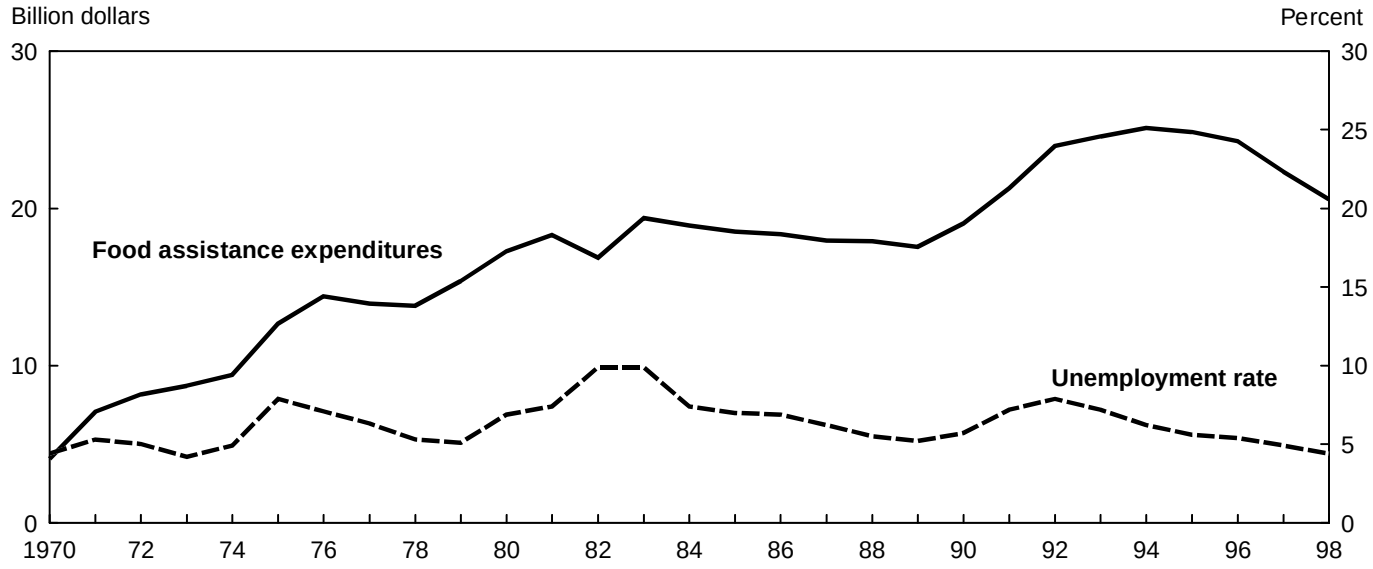
where C_{it} is the natural log of per capita food stamp caseloads, UR_{it} is the unemployment rate, EMP_{it} is a measure of employment per capita, W_{it} is a welfare reform indicator that equals the fraction of a year that "any statewide AFDC waiver" is in effect, B_{it} is the real maximum AFDC/TANF plus food stamp benefit for a family of three, P_{it} is a vector of variables reflecting the political climate of a State, $ABAWD_{it}$ is the weighted percentage of a State's population waived from work requirements for unemployed able-bodied adults without dependents, EBT_{it} is an indicator that equals the fraction of a year that a State's recipients received benefits via the Electronic Benefits Transfer program, γ_t is a vector of year effects, δ_i is a time-invariant State-specific deviation from the overall constant μ,λ_{it} is a State-specific trend, and ε_{it} is a random error.

Figure 4
U.S. real expenditures on all food assistance, food stamps, child nutrition, and WIC, 1970-98



Source: U.S. Dept. of Agr., Food and Nutrition Serv.

Figure 5
U.S. real food assistance expenditures and the unemployment rate, 1970-98



Source: U.S. Dept. of Agr., Food and Nutrition Serv.

Table 1—Effect of macroeconomic variables on total real food assistance expenditures in the United States

Variables	(1)	(2)
(Log of) Real food assistance expenditures in year t-1	0.238 (2.572)	0.615 (5.871)
Unemployment rate in year t	.032 (3.090)	
Unemployment rate in year t-1	.015 (2.426)	
GDP growth rate in year t		.0014 (.303)
GDP growth rate in year t-1		-.025 (-6.112)
Inflation in year t	.022 (3.347)	.011 (2.091)
Time trend	.031 (5.746)	.019 (3.946)
Constant	-54.506 (-5.490)	-33.054 (-3.639)
Adjusted R-squared	.969	995

Notes: The dependent variable is the log of real food assistance expenditures. The Prais-Winsten correction for serially correlated residuals is used. T-statistics are in parentheses. Please see the text for more details on the models.

We use another measure of macroeconomic health, the growth rate of GDP in model 2. Here, the effect of contemporaneous GDP growth rate is insignificant, but the previous year's growth rate is significant. The combined effect implies that a 1-percent decrease in GDP growth rate leads to a 7.2-percent increase in food assistance expenditures. The effect of inflation is less in this model, but the strong influence of time is still present.

The decomposition of food assistance expenditures in figure 4 shows that the time path of the various components of total food assistance expenditures differs widely.[20] To see how the macroeconomy has different effects, we ran models identical to models (1) and (2) for the three largest food assistance programs.[21] Except for contemporaneous unemployment's effect on the WIC program, the Food Stamp Program is the only one with expenditures influenced by either unemployment or GDP growth (table 2). A 1-percent increase in unemployment leads to an 11.3-percent increase in food stamp expenditures, and a 1-percent decrease in GDP growth rates leads to a 10.2-percent increase in food stamp expenditures. The only other variable that matters for the other programs, in either model, is the previous period's expenditures. The WIC program is not an entitlement program and, thus, does not have the capacity to expand during economic downturns, and, even during economic expansions, persons are rationed from the program. Consequently, we may not anticipate much of an influence of the macroeconomy, and the influence of current unemployment is unexpected.

In the United States, food assistance expenditures are countercyclical (that is, increasing during economic downturns and decreasing during expansions), but food assistance expenditures in Mexico appear to be neither counter- nor procyclical. The general pattern of real food assistance expenditures in Mexico from 1988 to 1998 is seen in figure 6 (the figures are deflated by the Mexican equivalent of the U.S. CPI-U).[22] From 1989 to 1993, food assistance expenditures generally declined mainly because of the decline in DICONSA expen-

[20]Total food assistance expenditures are broken into five components: The Food Stamp Program and the Nutrition Assistance Programs in Puerto Rico, the Northern Marianas, and, starting in 1996, American Samoa; all these combined are denoted by food stamps.

The National School Lunch, School Breakfast, Child and Adult Care, Summer Food Service, and Special Milk programs = child nutrition.

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) and the Commodity Supplemental Food Program = WIC.

The Food Distribution Program on Indian Reservations, the Nutrition Program for the Elderly, the Disaster Feeding Program, the Emergency Food Assistance Program, the Food Distribution Program for Charitable Institutions and Summer Camps, and the food donation programs to soup kitchens and food banks = food donations.

Administrative expenses. The first three are much larger than food donations and administrative expenses, so we consider only those here.

[21]The only difference is that the lagged term always refers to the food assistance expenditure category itself rather than total food assistance expenditures.

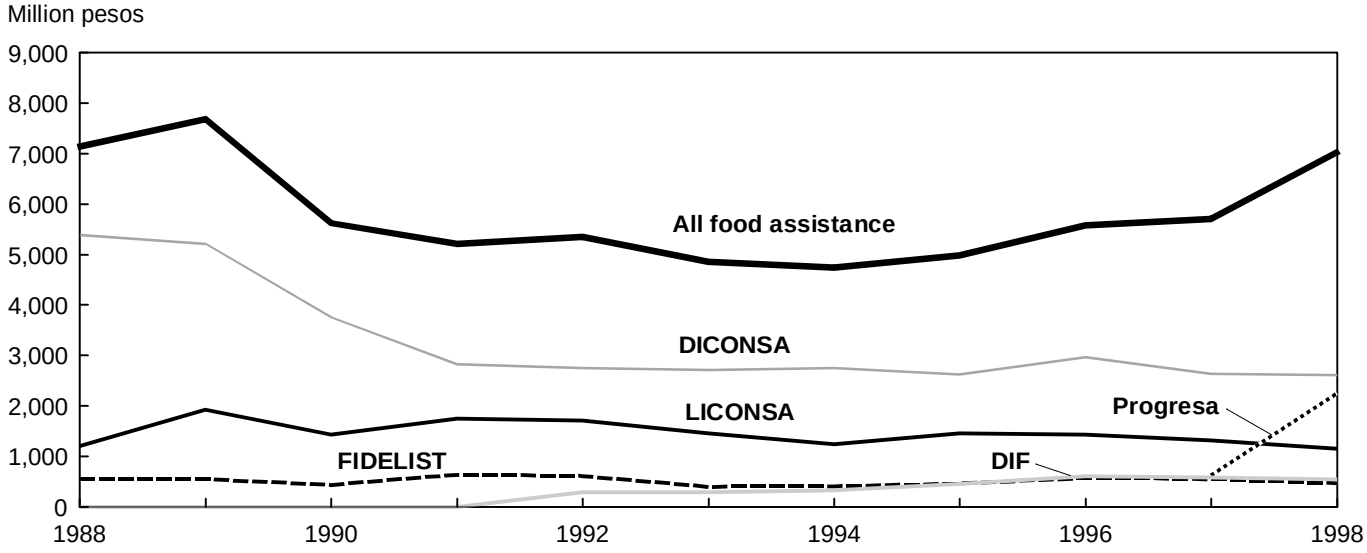
[22]Most of the food assistance expenditure information is from *Informe de Gobierno,* 1998. Information for years before 1988 in a comparable format is not available, however. In earlier years, all food assistance expenditures were subsumed under spending on a more general category of social assistance programs (*Informe de Gobierno,* 1991).

Table 2—Effect of macroeconomic variables on food assistance expenditures in the United States by category of expenditure

Variables	Log of real food stamp expenditures		Log of real child nutrition expenditures		Log of real WIC expenditures	
	(1)	(2)	(1)	(2)	(1)	(2)
Log of real expenditures on ____ in year t-1	0.167	0.389	0.594	0.605	0.722	0.843
	(2.200)	(6.604)	(4.597)	(5.776)	(6.293)	(8.001)
Unemployment rate in year t	.056		-.0042		.118	
	(4.108)		(-.378)		(2.990)	
Unemployment rate in year t-1	.044		.0081		-.0011	
	(2.349)		(.571)		(-0.251)	
GDP growth rate in year t		-.0024		.0092		-.025
		(-.391)		(1.745)		(-1.184)
GDP growth rate in year t-1		-.033		-.0088		-.036
		(-6.013)		(-1.988)		(-1.808)
Inflation in year t	.029	.017	.0041	.0083	.044	.030
	(3.514)	(2.322)	(.497)	(1.236)	(1.860)	(1.176)
Year	.038	.028	.0058	.0068	.039	.016
	(6.454)	(4.734)	(1.204)	(1.529)	(1.724)	(0.636)
Constant	-69.274	-49.908	-8.098	-10.284	-77.203	-29.805
	(-6.126)	(-4.387)	(-.935)	(-1.256)	(-1.716)	(-.618)
Adjusted R-squared	.976	.987	.977	.987	.901	.900

Notes: The Prais-Winsten correction for serially correlated residuals is used. T-statistics are in parentheses. The "____" in the listing of variables refers to the expenditures on the food assistance program displayed in the relevant column.

Figure 6
Real Mexican expenditures on all food assistance, DICONSA, LICONSA, FIDELIST, DIF, and Progresa, 1988-98



Note: Expenditures expressed in 1994 pesos.
Source: *Informe de Gobierno.*

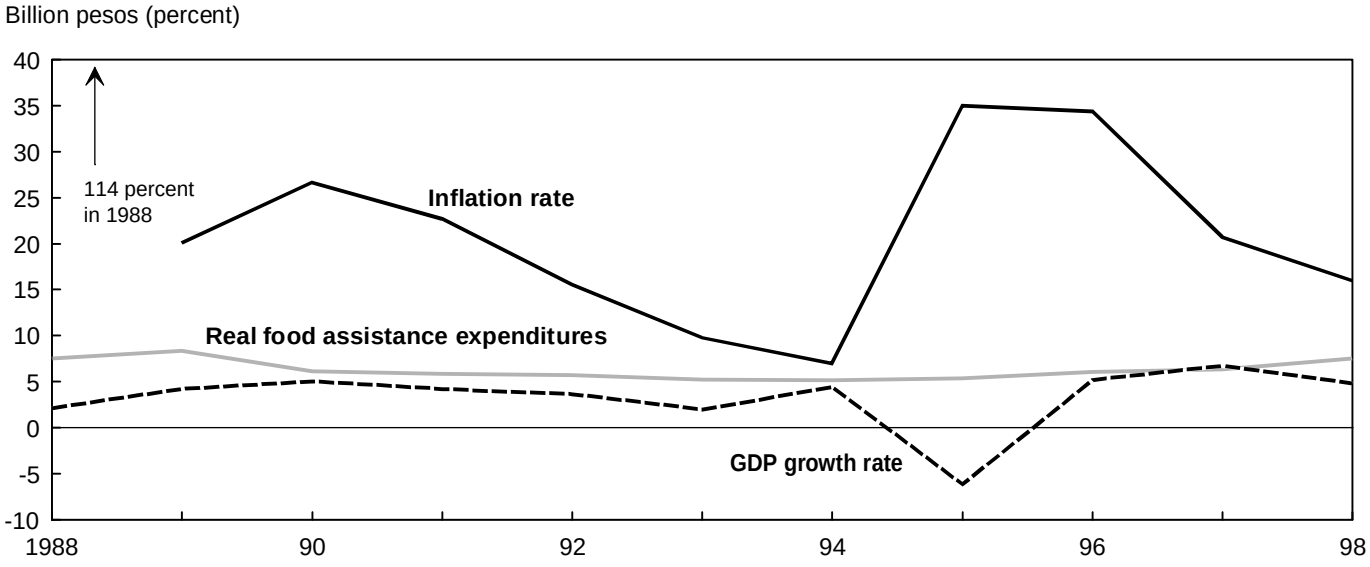
ditures. From 1993 on, expenditures increased sharply due to the introduction of Progresa in 1997.

Figure 7 is comparable to figure 5 and shows the relationship between the Mexican economy's health and total food assistance expenditures. Because the unemployment rate in Mexico is not directly comparable to the U.S. unemployment rate, we instead show the growth rate of GDP. We also show the inflation rate in Mexico because its level and volatility have a large influence on the Mexican economy.

Neither the inflation rate nor the GDP growth rate appears to have any influence on food assistance expenditures. During times of high inflation in 1988 and 1995, food assistance expenditures were unaffected, and when GDP dropped sharply in 1995 due to the peso devaluation in December of 1994, food assistance expenditures did not change. Conversely, despite the high economic growth in many of these years, expenditures did not change either. One possible explanation for this lack of influence is that Mexican food assistance programs are primarily designed to aid those whose depth of poverty is so great that they are unaffected by larger economic forces and are poor for longer periods. If this is the case, then we may not find the countercyclical relationship found in the United States where the average length of food stamp receipt is about 9 months (Gleason, Schochet, and Moffitt, 1998).

One difference between the determinants of expenditures on food assistance programs should also be emphasized. In the United States, the types of foods available for most food assistance recipients are relatively unrestricted, and when prices rise in one product, individuals (or, in the case of school meals, school districts) can purchase lower priced substitutes. Thus, an increase in price for any commodity will not produce a major increase in food assistance expenditures. In Mexico, however, many of the food assistance programs are tied to one commodity. For instance, Federal transfers for LICONSA declined in real terms in 1997 compared with 1996. This is explained by a drop in the level of international prices for dried milk as well as prices of the main inputs used in production, rather than budget restrictions or domestic macroeconomic variables. However, the decrease did not affect production and distribution of milk, as these were maintained at the same levels as in 1996.

Figure 7
Real Mexican food assistance expenditures, inflation rate, and GDP growth rate, 1988-98



Note: Expenditures expressed in 1994 pesos.
Source: *Informe de Gobierno.*

Food Assistance and Well-Being

The goal of most food assistance programs in both countries is to improve the nutrition of lower income households. In addition, by freeing up money previously allocated to food expenditures, the well-being of households over other dimensions may improve as well. Research on the benefits of food assistance programs in the United States, especially in terms of the Food Stamp Program, is more extensive than for Mexican food assistance programs. Here we review several studies that examine the effect of food assistance programs on food security, nutrition, and food consumption in the United States with brief references to the available literature for Mexico. We conclude this section with a recalculation of poverty rates in Mexico after the inclusion of food assistance benefits.

Food Assistance and Food Insecurity

In the United States, the "USDA food insufficiency question," one measure of food insecurity, has been included on numerous surveys since the early 1970's. This question asks respondents to describe their household's recent food intake by responding to the following question: "Which of these statements best describes the food eaten in your household in the last four months?" They may choose one of four answers: (1) "enough of the kinds of food we want to eat"; (2) "enough but not always the kinds of food we want to eat"; (3) "sometimes not enough to eat"; or (4) "often not enough to eat." Households reporting that they sometimes or often do not get enough to eat are considered food insufficient and are asked a further question: "In what month(s) did your household not have enough to eat?"[23]

Gundersen and Oliveira (1999) examined the effect of food stamps on food insufficiency, using the above question. Out of eligible households, 8.5 percent of participating households were food insufficient, while 4.2 percent of nonparticipants were food insufficient. On the surface, this is surprising: participants are presumed to have more resources, in the form of food stamps, to purchase enough food to avoid food insufficiency. However, this breakdown does not accurately portray the effect of food stamps on food insufficiency. Households more likely to be food insufficient, with or without food stamps, may also be the same households more likely to enter the program. If so, there are two main consequences. First, the program is effectively targeting its benefits insofar as households most in need are receiving the benefits. Second, the positive effects of food stamps on food insufficiency are diminished because of adverse selection.

Gundersen and Oliveira showed that with a univariate probit model, one finds that participation in the Food Stamp Program is associated with substantially higher probability of being food insufficient. However, for reasons noted above, this finding is biased if households more likely to receive food stamps are also more likely to be food insufficient. To account for this possible endogeneity, they used a simultaneous equation model with two probits to estimate simultaneously the impact of participation on the food sufficiency status of households and the impact of food insufficiency on the probability of participating in the program. Results from this model indicate substantially different results than if separate univariate probits are analyzed. In particular, food stamps have no effect on food insufficiency, and food insufficient households are no more likely to receive food stamps than food sufficient households. Households with some of the characteristics associated with food insufficiency, though, are more likely to join the Food Stamp Program, indicating that effective targeting exists over this dimension.

Two other studies also looked at the effect of food stamps on food insufficiency. In a study of hunger among adult patients receiving medical care in an urban hospital in Minnesota, Nelson, Brown, and Lurie (1998) found that loss of food stamps was a significant determinant of food insufficiency. In a study of households with incomes less than 200 percent of the poverty line, using monthly data over a 9-month time horizon, Gundersen and Gruber (1999) found a similar result for a wider sample. Food-insufficient households were almost three times as likely to have lost food stamp benefits as food-sufficient households. Out of all households in the sample, 5.9 percent had lost their food stamp benefits. Food-insufficient households had a food stamp loss rate of 14.8 percent, while food-sufficient households had a food stamp loss rate of 5.4 percent.

Food Assistance and Nutrition

There have been numerous studies of the effect of food assistance programs on nutritional intake in the United States. The studies we review all controlled for factors other than food assistance participation. Those other factors included income, self-selection into the programs (for reasons discussed above in the context of food insecurity), location, household size, household composition (for example, single-parent household, dual-parent household), education, and age.

Studies of nutrient intake levels, all using the CSFII data set, have found, holding all else constant, participants had higher nutrient intake levels than eligible nonparticipants. Devaney and Moffitt (1991) found that the marginal propensities for low-income households to consume nutrients out of food stamps is higher than out of cash for each of the nutrients.[24] Basiotis, Kramer-LeBlanc, and Kennedy (1998) examined the effect of food stamps and WIC on the Healthy Eating Index (HEI), an index of overall diet quality. They found that above some minimum food stamp benefit level, food stamp recipients had higher HEI scores than eligible nonre-

[23]Several studies have confirmed the validity of the USDA food sufficiency question as a measure of decreased food intake (Cristofar and Basiotis, 1992, and Rose and Oliveira, 1997).

[24]The nutrients are food energy, protein, vitamin A, vitamin C, thiamin, riboflavin, vitamin B6, calcium, phosphorus, magnesium, and iron. They used the 1989-90 CSFII.

cipients.[25] Wilde, Ranney, and McNamara (1999) found that food stamp use leads to statistically significantly higher intakes of meats, added sugars, and total fats, three economically efficient sources of food energy.

Similar results held for WIC recipients.[26] Oliveira and Gundersen (1999) considered the effect of WIC on children ages 1 to 4. They found that, with and without controlling for possible selection bias, WIC recipients had higher nutrient intakes for most nutrients than eligible nonrecipients.[27] Wilde, Ranney, and McNamara (1999) found that, all else equal, WIC recipients had lower intakes of added sugars. Earlier studies using different methodologies have also found improvements in nutrient intake among WIC recipients. A 1989 National WIC Evaluation found that children receiving WIC had higher mean intakes of iron, vitamin C, thiamin, niacin, and vitamin B6, without an increase in food energy intake. This lack of an increase in food energy indicates that there was an increase in the nutrient density of the diet (U.S. Dept. Agr., Food and Nutrition Serv., 1989). Yip et al. (1987) showed that the WIC program was partly responsible for the over 60 percent decline in iron deficiency anemia from 1975 to 1985. WIC also appears to increase breast-feeding among recipients (U.S. Dept. Agr., Food and Nutrition Serv., 1995, 1992, 1989). Other post-1980 analyses of the effect of food assistance on nutrition include Alkin et al., 1985; Butler and Raymond, 1996; and Rose, Habicht, and Devaney, 1997.

The only studies we are aware of in Mexico regarding the effect of food assistance programs on nutrition are a 1980 joint study by the Instituto Nacional de Nutrición and Harvard University about the now-defunct Mexico City milk program and a 1992 study about the distribution of dehydrated milk through LICONSA. Both of these found little beneficial effects of the programs. One conclusion was that if poorer households were reached instead of the relatively better off households, a greater effect would have been realized (Chavez et al., 1996; p. 175).

The Effect of Food Assistance Versus Cash on Food Consumption

There have been numerous studies comparing the relative contribution of food stamps versus cash on the marginal propensity to consume food (see, e.g., Fraker, Martini, and Ohls, 1995; Levedahl, 1995; and Moffitt, 1989). Using "cash-out experiments," where a random sample of food stamp recipients receive cash instead of food stamps and a control group continues to receive food stamps, these studies found that the marginal propensity to consume food out of food stamps was higher than out of cash. While this finding may be expected for households who would spend less on food in the absence of food stamps than they receive in food stamps, it is unexpected for infra-marginal households (households spending more on food than they receive in food stamps). These infra-marginal households constitute about 90 percent of food stamp households. Studies have also found this for WIC (Arcia, Crouch, and Kulka, 1990).

Food Assistance and Poverty Rates

U.S. poverty rates are calculated based on households' pretax income. One common criticism of this method is that in-kind benefits like food stamps and WIC are not included (for example, Citro and Michael, 1995). For example, suppose the Food Stamp Program expanded (as occurred in the early 1970's), but there was no change in the poverty rate. The beneficial effect of expanding food stamps would thus not be reflected. The effectiveness of in-kind benefits in reducing poverty can be figured by the extent to which the poverty rate is reduced when the value of in-kind benefits is added to cash income. Using 1997 data, the U.S. poverty rate, as measured by the head count ratio, declined by 1.4 percentage points after food assistance and housing benefits were included (Dalaker and Naifeh, 1998; p. xv).

Two types of measures are used to characterize poverty in Mexico. The first type uses more direct measures of well-being. These direct measures are generally defined with respect to housing quality and community services. These measures generally do not use nutrition information, except indirectly (for example, lack of running water may produce higher rates of sickness, leading to higher malnutrition rates), although they are probably highly correlated with malnutrition measures. The Indice de Marginación is one such measure. The second type of poverty measure uses household income or expenditures. Common poverty lines are defined as one minimum salary, two minimum salaries, the minimum expenditures needed to purchase the most basic needs, and the minimum expenditures needed to purchase a slightly larger set of basic needs. These latter two lines are based on baskets of goods established by the General Coordinator for the National Plan for Marginal Zones (COPLAMAR): the Canasta Normativa Alimentaria (CAN) and the Canasta Normativa de Satisfactores Esenciales (CNSE) (COPLAMAR, 1985).

We analyzed how poverty rates are affected by the inclusion of food assistance benefits.[28] We do not have data on whether any household receives food assistance benefits; rather, we just know the percentage of people receiving benefits in every State, broken down by type of assistance. This information is taken from the 1995 Conteo de Poblacion y Vivienda (INEGI, 1997). From the 1994 Encuesta Nacional

[25]As opposed to other indexes that focus on nutrients, the HEI is measured almost exclusively with respect to the consumption of 10 broad categories of foods: grains, vegetables, fruit, dairy, meat, total fat, saturated fat, cholesterol, sodium, and variety.

[26]In addition to positive impacts on nutrition, in comparison to non-participants, WIC participants, ceteris paribus, have longer pregnancies, fewer premature births, a lower incidence of moderately low and very low birth weight, fewer infant deaths, and are more likely to receive prenatal care (U.S. Dept. Agr., Food and Nutrition Serv., 1993, 1992).

[27]In the nonselection bias model, the nutrients for which WIC recipients had higher intakes than nonrecipients are iron, vitamin C, vitamin A, vitamin B6, and folate. In the selection bias model, the nutrients are iron, calcium, vitamin B6, and folate.

[28]We implicitly assume that food assistance benefits do not produce any changes in behavior among low-income households. For more on the reasons behind this assumption, see "Identification of Recipients" above.

de Ingreso-Gasto de Hogares (ENIGH), though, we do have total monetary and nonmonetary expenditure information at the household level (INEGI, 1992). If food assistance is received, the value of food assistance benefits per person in a household is taken from *Informe de Gobierno* (1998). Since we do not know the exact distribution of benefits, we consider three possible distributions of benefits.

First, we imputed the value of food assistance benefits to households, assuming that in each State the benefits are evenly distributed throughout the population below the poverty line. We took the current level of benefits in each State as reported in the CPV and assigned each poor family an equal share of these benefits. For example, in Chiapas where 5.68 percent of households received LICONSA and 62.39 percent of households were poor, each household was assigned a 9.10-percent share of LICONSA benefits (62.39 percent divided by 5.68 percent).[29]

Second, we imputed the value of food assistance assuming that benefits are perfectly targeted within States. Perfect targeting implies that only the poorest households receive benefits. For each State, we took the current number of beneficiaries as reported in the CPV, but assigned benefits only to the poorest x households, where x is the number of current beneficiaries. Each household receiving benefits was assigned an amount for any particular benefit equal to the percentage of households receiving the benefit times the value of the benefit. For example, in Chiapas, the poorest 14.03 percent of households would receive benefits, and the remaining 85.97 percent would not.

The third scenario does not rely on the distribution of benefits by State. Instead, we assumed that benefits were perfectly targeted nationally. Nationally, 20.16 percent of households received benefits in 1995, and so benefits were assigned to the poorest 20.16 percent of households, regardless of their State of residence. For each of the households, the level of benefits was assigned as in scenario 2.

We used the following general axiomatically derived poverty measure, the Foster-Greer-Thorbecke measure, for our analysis:

$$P_\alpha = \left(\frac{1}{n}\right)\sum_{i=1}^{q}\left(\frac{Z - Y_i}{Z}\right)^\alpha$$

where n is the total number of households, Z is the poverty line, q is the number of households whose expenditure falls below the poverty line, and Y_i is the expenditure of the ith household. The parameter α is greater than or equal to zero. When α is equal to zero, all persons below the poverty line are equally reflected in the poverty measure. When it approaches infinity, only the income of the household with the lowest income is reflected.

When α is zero, this equation defines the head count index. The head count index is simply the fraction of the population whose income falls short of the poverty line. When α is one, the equation above defines the proportional poverty gap (PPG). The PPG accounts for the level of income of the poor (that is, the intensity of the poverty). The PPG weights the head count index by the ratio of the average income shortfall of the poor to the poverty line. When α equals two, the equation above defines the so-called distribution sensitive index. The distribution sensitive index accounts for the severity of poverty by giving greater weight to the income of the poorest households.[30]

Table 3 displays the results for the estimation of poverty rates using the ENIGH survey data on expenditures. The first column lists the estimates for poverty rates based on household expenditure per capita without the inclusion of food assistance benefits. The poverty rates for the head count, PPG, and distribution sensitive measures are 0.286, 0.098, and 0.047 (see equation above). Under the three scenarios described in the previous section, the poverty estimates for household expenditure per capita with the inclusion of food assistance are 0.282, 0.095, and 0.045 if benefits are distributed equally to all poor households (by State); 0.284, 0.096, and 0.045 if benefits are distributed to the poorest households (by State); and 0.286, 0.095, and 0.044 if benefits are distributed to the poorest households in the country. Below each of the rows with the poverty measures, the decline in the poverty rate for each scenario is presented. The absolute declines in poverty rates translate to the following relative declines. For scenario 1, the inclusion of food assistance benefits implies a 1.5-percent decline in the poverty rate for the head count measure; a 2.6-percent decline for the poverty gap measure; and a 3.2-percent decline for the distribution sensitive measure. For scenario 2, the relative declines are 0.6 percent, 2.0 percent, and 3.7 percent. For scenario 3, the relative declines are 0 percent, 2.8 percent, and 5.2 percent. In none of these cases is the decline in poverty statistically significant at usual confidence intervals.[31]

These declines in poverty rates due to the inclusion of food assistance benefits are substantially less than in the United States. The decline in the poverty rate in the United States is about 10.2 percent, although this figure includes other in-kind benefits such as housing assistance (but not medical insurance). Two primary differences between food assistance programs in the two countries may explain the smaller effect on poverty in Mexico. First, the level of benefits as a

[29]Consistent with the discussion of benefits above, the actual amount of LICONSA benefits assigned depends on the number of children below the age of 12. A household with no children, for example, would not get benefits.

[30]For greater details on the data sets used, the assumptions used to impute benefits, the methods of calculating levels of benefits, the poverty measures, and an analysis broken down by food assistance program, see Gundersen and Kelly, 1999.

[31]To calculate the t-statistics in tables 3 and 4, we used a technique derived from Kakwani, 1993. The t-statisic is

$$t = \frac{\left(\hat{P}_1 - \hat{P}_2\right)}{SE\left(\hat{P}_1 - \hat{P}_2\right)}, \text{where } SE\left(\hat{P}_1 - \hat{P}_2\right) = \left(\frac{\hat{\sigma}_1^2}{n_1}d_1 + \frac{\hat{\sigma}_2^2}{n_1}d_2\right)^{1/2}, \hat{\sigma}^2 = \left[\frac{1}{n}\sum_{i=1}^{q}\left(\frac{Z - Y_i}{Z}\right)^\alpha\right]^2, \text{and}$$

$d_i = \rho(v\text{-}1)+1$, i=1,2 and, where d_i is the design effect for the ith sample, ρ is the intraclass correlation coefficient, and v is the average number of households per cluster.

Table 3—Poverty rates with and without food assistance benefits, Mexico

Poverty measure	Food assistance distribution scenarios		
	Scenario 1	Scenario 2	Scenario 3
	Equal distribution to all poor households (by State)	Distribution to poorest households (by State)	Distribution to poorest households (for country)
Head count (α=0)	0.2815	0.2843	0.2860
Change in poverty rates due to benefits	.0044 (.500)	.0017 (.173)	0 (0)
Poverty gap (α=1)	.0952	.0956	.0949
Change in poverty rates due to benefits	.0025 (.595)	.0020 (.484)	.0027 (.653)
Distribution sensitive (α=2)	.044	.0447	.0441
Change in poverty rates due to benefits	.0015 (.617)	.0017 (.693)	.0024 (.976)

Notes: T-statistics are in parentheses. The poverty rates without food assistance benefits for the poverty measures are 0.2860 (α=0), 0.0976 (α=1), and 0.0465 (α=2).

percentage of income is much lower in Mexico. In the United States, the nominal value of food stamps can be as much as 50 percent of a household's income (Ohls and Beebout, 1993). In Mexico, under the assumption that a household receives benefits from every food assistance program, the average family below the poverty line receiving food assistance in an urban area would receive a maximum of 3.8 percent of its total expenditures in food assistance benefits and the average rural family would receive a maximum of 5.1 percent.

Second, a far larger percentage of people participate in the United States. In 1997, over 90 percent of households with positive incomes below the poverty line participated in the Food Stamp Program (Castner and Cody, 1999, table 4).[32] Using the figures from the CPV, in Mexico less than 70 percent of the low-income population participates in a food assistance program. These differences can be ascribed to the targeting methods used in the countries – in the United States there is no geographic targeting and any income-eligible household can participate, while in Mexico, a person could be income-eligible but not live in a geographically targeted area.

For a comparison with the United States, we now consider how poverty rates would differ in Mexico under the supposition that food assistance benefits were expanded in both these directions; that is, if average benefits and participation rates were both increased. We simulate three cases with higher average benefit levels and three cases with higher participation rates. The results are displayed in table 4.

To simulate the effect on poverty rates of higher average benefit levels, we assume that Mexico implements 10-, 25-, and 50-percent increases in the benefits of each program. With a 10-percent increase in benefits, for scenario 1, the inclusion of food assistance benefits implies a 1.6-percent decline in the poverty rate for the head count measure; a 2.8-percent decline for the poverty gap measure; and a 3.7-percent decline for the distribution sensitive measure. For scenario 2, the relative declines are 0.7 percent, 2.3 percent, and 4.1 percent. For scenario 3, the relative declines are 0 percent, 3.1 percent, and 5.6 percent. With a 50-percent increase in benefits, for scenario 1, the inclusion of food assistance benefits implies a 2.3-percent decline in the poverty rate for the head count measure; a 4.0-percent decline for the poverty gap measure; and a 4.7-percent decline for the distribution sensitive measure. For scenario 2, the relative declines are 0.9 percent, 3.1 percent, and 5.4 percent and for scenario 3, the relative declines are 0 percent, 4.2 percent, and 7.8 percent.[33] (The preceding declines are based on the results in table 4.)

To simulate the effect on poverty rates of an expansion in the number of beneficiaries, we assume, as above, that Mexico implements 10-, 25-, and 50-percent increases. Because the scenario of assigning equal benefits to all poor households in a State does not make sense in this context, we only consider the cases of assigning benefits to the poorest households by State and in the country. For all scenarios and poverty measures, the decline in poverty is smaller due to expansion in the number of recipients than due to expansion in benefit levels. The difference can be quite stark in the case of a 50-percent increase: for scenario 2 under the distribution-sensitive measure, the decline is 25 percent greater for an increase in benefit levels, and for scenario 3 under the distribution-sensitive measure, almost 40 percent greater. These large differences are probably due to the large number of nonpoor recipients in major population centers such as the Distrito Federal, where 28 percent of households

[32]Other food assistance programs have even higher participation rates among poor households.

[33]For the head-count and poverty-gap poverty measures, the decline in poverty is not significant at usual confidence intervals for any of these increases, irrespective of the targeting assumptions. This is also true for 10- and 25-percent increases for the distribution sensitive measure. With a 50-percent increase in benefits, the decline in poverty is statistically significant (at the 10-percent level) for the distribution sensitive measure under the assumption that benefits are targeted to the poorest households in the country.

are poor but 36 percent of residents participate in at least one food assistance program. When the number of beneficiaries increases in these areas, there is no decrease in the poverty rates because the incomes of nonpoor households are not reflected in these poverty measures. If Mexico is interested in expanding its food assistance programs and the goal is reduction of poverty, expanding the benefit level would be much more effective than expanding the number of beneficiaries.

We recognize that food assistance programs are not income transfer programs, rather they are nutrition supplement programs. Insofar as the poverty rate is a proxy for the extent of deprivation over more direct measures of well-being (such as nutrition), this recalculation of poverty rates measures the decrease in deprivation due to food assistance benefits. The effects on nutrition may differ.

Table 4—Simulations of changes in poverty rates in Mexico due to increases in benefit levels and number of recipients

Poverty measure	Food assistance distribution scenarios		
	[1] Equal distribution to all poor households (by State)	[2] Distribution to poorest households (by State)	[3] Distribution to poorest households (for Country)
	Change in poverty rates due to benefits		
	10-percent increase in benefit levels		
Head count (α=0)	0.0047	0.0020	0
	(.482)	(.197)	(0)
Poverty gap (α=1)	.0027	.0022	.0030
	(.653)	(.533)	(.719)
Distribution sensitive (α=2)	.0017	.0019	.0026
	(.676)	(.763)	(1.074)
	10-percent increase in number of recipients		
Head count (α=0)		0020	0
		(.205)	(0)
Poverty gap (α=1)		.0023	.0030
		(.552)	(.714)
Distribution sensitive (α=2)		.0019	.0025
		(.757)	(1.006)
	25-percent increase in benefit levels		
Head count (α=0)	.0057	.0022	0
	(.577)	(.221)	(0)
Poverty gap (α=1)	.0031	.00025	.0033
	(.738)	(.606)	(.818)
Distribution sensitive (α=2)	.0019	.0021	.0030
	(.764)	(.867)	(1.221)
	25-percent increase in number of recipients		
Head count (α=0)		.0023	0
		(.237)	(0)
Poverty gap (α=1)		.0025	.0033
		(.600)	(.804)
Distribution sensitive (α=2)		.0020	.0025
		(.808)	(1.034)
	50-percent increase in benefit levels		
Head count (α=0)	.0065	.0025	0
	(.656)	(.252)	(0)
Poverty gap (α=1)	.0037	.0030	.0041
	(.880)	(.727)	(.985)
Distribution sensitive (α=2)	.0022	.0025	.0036
	(.910)	(1.040)	(1.467)
	50-percent increase in number of recipients		
Head count (α=0)		.0023	.0031
		(.237)	(.316)
Poverty gap (α=1)		.0025	.0036
		(.600)	(.864)
Distribution sensitive (α=2)		.0020	.0026
		(.808)	(1.050)

Notes: T-statistics are in parentheses.

Conclusion

Food assistance programs in Mexico and the United States are in some ways quite similar. In both countries, identification methods use information about households and/or individuals; the programs are financed internally; and an improvement in the nutritional quality of diets (especially for children) is the primary goal of the many different programs. This similarity allows for comparisons among programs in the countries. In this report, we considered three critical elements to any analysis of food assistance programs: the methods of targeting, the influence of macroeconomic conditions on total expenditures, and the effect of food assistance benefits on well-being. We now consider two examples of how insights from one country can be applied to the food assistance programs of the other country.

While both countries identify recipients based on household criteria, Mexico generally uses a two-stage procedure whereby areas in need of food assistance are first identified and then families within those areas are identified. In the United States, regions are not used in the identification procedure. Poverty is, however, sometimes concentrated in specific geographic areas, especially in parts of the rural deep south, Appalachia, on Indian reservations, and in some central cities. U.S. researchers could use the methods developed by Mexican food assistance programs to more effectively aid beneficiaries, especially when the programs have large fixed administrative costs. This is particularly true in terms of outreach programs and, perhaps, setting higher benefit levels for certain areas.

The effects of food assistance programs on individuals' well-being can be measured in the United States because surveys include relevant questions about food assistance receipt, food insecurity status, and food intakes. Unfortunately, information on food assistance receipt disaggregated to the household level is not available for Mexico, although it is available at more aggregated levels. Also, information on food insecurity status and food intakes in Mexico is available neither at the household level nor at more aggregated levels.[34] Because sound theoretical frameworks and econometric methods are well-developed, the inclusion of such questions would enable thorough studies of the effects of food assistance benefits in Mexico.

[34]Surveys in Mexico do ask extensive questions about housing quality and the availability of services such as electricity and running water.

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Appendix table A

Mexican food assistance participation rates and poverty rates, 1995, by State

State	Share who are poor	Share receiving food assistance
	Percent	
Baja California (Norte)	20.5	5.2
Baja California Sur	27.4	18.2
Distrito Federal	27.5	36.1
Nuevo Leon	27.5	18.3
Aguascalientes	31.1	21.8
Sonora	31.1	12.6
Sinaloa	31.3	10.6
Chihuahua	32.7	10.9
Quintana Roo	33.3	19.4
Coahuila de Zaragoza	33.5	19.1
Mexico	33.7	32.2
Colima	34.5	22.6
Jalisco	34.9	13.7
Queretaro	39.1	15.3
Morelos	40.3	23.0
Tamaulipas	41.9	21.5
Nayarit	44.4	25.9
Guanajuato	45.6	13.3
Durango	46.7	28.4
Tlaxcala	51.3	27.8
Tabasco	51.6	15.3
Campeche	51.6	23.8
San Luis Potosi	51.7	20.5
Veracruz	54.6	10.4
Puebla	54.8	12.0
Michoacan	55.5	17.8
Yucatan	56.8	22.3
Hidalgo	57.1	25.8
Zacatecas	57.5	25.4
Guerrero	59.0	24.3
Chiapas	62.4	14.0
Oaxaca	62.9	9.5

Source: Conteo de Población y Vivienda.

Appendix Table B

U.S. food stamp participation rates and poverty rates, 1995, by State

State	Share who are poor	Share receiving food stamps
	Percent	
New Hampshire	4.9	6.9
Utah	5.8	8.3
Wisconsin	6.1	8.5
Nebraska	6.3	9.9
Nevada	6.3	10.1
Iowa	6.3	10.5
North Dakota	6.4	12.2
Massachusetts	6.4	11.1
Colorado	6.5	9.2
South Dakota	6.7	14.2
Idaho	6.7	13.7
Minnesota	6.7	9.5
New Jersey	6.8	8.8
Connecticut	6.9	10.0
Wyoming	6.9	12.5
Kansas	7.1	10.5
Alaska	7.6	8.0
Indiana	7.6	8.6
Maryland	7.8	9.6
Delaware	7.8	9.5
Montana	8.1	16.0
Virginia	8.2	11.7
North Carolina	8.3	12.1
Washington	8.6	11.2
Oregon	8.9	11.5
Rhode Island	9.2	11.5
South Carolina	9.6	15.4
Illinois	9.6	11.9
Pennsylvania	9.6	11.7
Florida	9.6	14.9
Vermont	9.8	10.7
California	10.0	16.7
Michigan	10.0	11.2
Ohio	10.0	11.7
Maine	10.4	10.9
Missouri	10.5	10.2
Hawaii	10.6	12.1
Arkansas	10.8	17.2
Arizona	10.8	17.9
Georgia	11.1	13.8
Oklahoma	11.2	15.8
New York	11.9	16.6
Alabama	12.0	16.6
Tennessee	12.2	15.2
Texas	13.1	16.9
Kentucky	13.3	15.9
New Mexico	14.0	24.0
Louisiana	16.0	18.8
West Virginia	16.5	17.2
D.C.	17.1	22.7
Mississippi	17.5	20.2

Source: U.S. Dept. Comm., Census Bur., and the U.S. Dept. Agr., Food and Nutrition Serv.