Distortions to Agricultural Incentives in Mexico

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Introduction and summary

This chapter estimates indicators of direct and indirect intervention by the Mexican government in agriculture over the period 1979 to 2005. To put the estimates in context, we describe the main characteristics of Mexican agriculture and the main economic policy developments that affected the sector over the last 25 years. We present estimates of the Nominal Rate of Assistance (NRA) for crops and animal products that comprise about 70 percent of the total value of Mexican agricultural production.

A significant share of Mexico's population lives in rural areas. In 2005, Mexico's population was 103 million, with 23 percent living in rural areas. This is less than half the 57 percent share living in rural areas in 1950. Agriculture remains important for employment in Mexico. In 2005, about 20 percent (8.5 million) of Mexico's 43 million economically active population was employed in agriculture.

Mexico is in the final stages of a demographic transition: in the past 5 years the rate of population growth was 1.2 percent per year, almost one third of the 3.1 percent annual growth rate of the 1950s and a half of that of 1990-95. Migration to the US, to urban areas, and within urban centers are powerful forces in Mexican labor markets.

For the period we analyze, Mexico had relatively modest economic growth. Growth levels averaging more than 5 percent per annum from 1950 and 1970, but GDP growth diminished to 2.6 percent per annum between 1980 and 2005. This translates into a low growth in per capita terms of just 0.9 per annum; or a cumulative 25 percent over the last 25 years. Table 1 shows the composition of growth by the three main economic sectors. Sluggish agricultural growth from the mid-1980s led to a lower share for agriculture in overall GDP. The services sector now accounts for about two thirds of total GDP.

Economic policy developments in Mexican agriculture since the late 1980s, and in particular since the late 1990s, marked a clear departure from the earlier closed economy and

interventionist schemes. Until 1990 Mexican agricultural policies were characterized by direct market interventions, with domestic prices in general kept above world prices by means of tariffs and import quotas. Beginning in 1991, the policy regime changed. Although some price support schemes remained in place, payments are being made on the basis of land owned or inputs used, which is more supportive of markets. NAFTA contributed to Mexcio's trade liberalization: in the context of NAFTA almost all trade barriers with the United States were eliminated by 2005. The main Mexican agricultural policy now in place is direct income payments to farmers.

Our NRA results illustrate the policy shift. For agricultural products covered in this study, nominal assistance averaged 17 percent in 2000-04. This implies a one-third decrease from the NRA in 1990-94. The share of non-product-specific assistance in Mexico's aggregate NRA increased significantly over the same period.

Agriculture in Mexico

Agricultural land in Mexico is approximately 75 percent rain-fed and 25 percent irrigated. Major uses of land are crop agriculture (13 percent of total area), livestock (55 percent), and forestry (23 percent). Within agriculture, annual cultivation dominates, accounting for approximately 85 percent of total agricultural land use. Grains – maize, beans, wheat, and sorghum – occupy 80 percent of the cultivated area, with maize alone occupying 52 percent of total cultivated acreage (Table 2). Much of the agricultural sector is characterized by low value crops and low labor productivity.

There are vast differences across rural areas in Mexico. A small number of commercial, globally-competitive large farms coexist with many import-substituting and subsistence-oriented small farms. The overall incidence of poverty is more than five time higher in the rural sector than in the urban sector, although there are large regional differences. Poverty is much higher in the South.

Over the past 15 years, the rural sector in Mexico experienced sweeping reform in land tenure, prices, markets and trade liberalization. Public investments, privatization, fiscal transfers, and the retrenchment of key autonomous public firms (known as *paraestatales*) also impacted on the rural sector. The policy changes produced shifts in the rural economy, increasingly linking Mexican farm prices to international prices. Farmers in productive areas

switched to new technologies and higher value crops. Large scale farmers — which are well connected to markets — adapted easily to the new environment. Subsistence farmers, on the other hand, mostly continued to be isolated from market forces. This is because they tend to live in regions where there is a limited potential to shift to higher value crops or to sustainable intensification. Many of these farmers instead resorted to migration and employment in local off-farm jobs to complement their agricultural income.

Pressure on marginal lands remains high and forests at the agricultural frontier continue to be cleared for subsistence agriculture and animal husbandry.

Agricultural yields for major importables and exportables grew during the 1990s in Mexico, particularly on irrigated lands. The heterogeneous nature of Mexican agriculture (one third of farmers produce for self consumption) and a series of sectoral programs to manage the transition to a more market-oriented economy helped prevent a collapse in domestic production of corn and other importables after the NAFTA agreement.

Total and rural poverty levels (Head Count Index) are shown in Figure 1 by region (Capital area, Center, Center North, Gulf, North, Pacific and South). Poverty levels are somewhat higher in rural areas than in the urban areas of Mexico, but there has been a substantial drop in those levels in the last 20 years. Regional differences in poverty levels remain though: in the North, the Pacific and the Capital areas there are relatively low levels of poverty, while the indicence is higher in the Center, Gulf and South regions of Mexico.

A recent study quantified the impact of growth on poverty reduction in Mexico (Soloaga and Torres 2007). The authors found that urban economic growth has an elasticity of around one in reducing head count poverty levels in urban areas. Rural growth (broadly defined as growth in agriculture and non-agricultural output in rural areas) has the same elasticity in reducing head count poverty in rural areas. But the study also found that rural growth has a greater impact on other poverty measures (the depth and severity of poverty), thus having a more pro-poor impact than urban growth.

Economic policy and agriculture in Mexico[1]

Since the mid-1980s, Mexico experienced strong changes in its economic policy, mostly aimed at driving the economy towards openness and competition. The opening up and

[1] For developments up to 2001 this section draws on Soloaga (2004).

deregulation of the economy impacted heavily on the agricultural sector. The new policies included significant trade and price reforms as well as the privatization of autonomous public enterprises, some of them of crucial importance for the agricultural sector. These reforms increasingly exposed the sector to global forces and to a totally new set of rules in land, output and input markets. This section provides a summary of main aspects of these policy reforms.

The opening up of the economy

Since 1985 Mexico has significantly reduced its tariffs, joining GATT in 1986. With the exception of sugar, the maximum tariff rate dropped from 100 percent to 20 percent. Mexico met most of its international commitments ahead of time and ahead of other developing countries. For example, GATT allowed Mexico to have a maximum tariff of 50 percent, but tariffs have been significantly lower than this since the 1980s, and many import licenses were converted to tariffs.

In 1994 Mexico signed the North American Free Trade Agreement (NAFTA) with Canada and the United States. NAFTA's main declared purposes are to eliminate tariff and non-tariff barriers among member states and to facilitate investment within the free trade area. NAFTA also contains provisions dealing with the environment and labor rights. Tariffs among NAFTA members were set at lower levels than the GATT provisions: the three countries agreed to eliminate tariffs and non-tariff barriers by 2008 according to a fixed program. Under NAFTA, Mexico liberalized 42 percent of tariff codes and agreed to phase out tariffs on foodstuffs and cotton over a period of 5 to 15 years. In addition, import licensing for these crops began to disappear and subsidies for bread producers were eliminated (Rello and Trápaga 2001).

Changes in domestic policies

In the agricultural sector, domestic policy changes included the liberalization of land property rights of the *ejidal* (common land) sector, the elimination or reduction of producer price supports on basic crops, the abolition of CONASUPO (Mexico's Agricultural State Trade Enterprise), and the reduction or elimination of input, credit and insurance subsidies (Casco 1999, OECD 1997, Cornelius and Myhre 1998, and Yunez-Naude 2003). Each of these policies is described below.

Reform in the ejido sector

The *ejido* sector grew out of the Mexican Constitution of 1917, which embodied a strong program of land reform. Under the program, the government granted land and water resources to communities of producers (known as *ejidos*). The community's members, or *ejidatarios,* had usufruct rights to the land contingent on occupation and cultivation. They were prohibited from hiring labor. Under the *ejido* system, land could not be alienated, rented or mortgaged and absences from the *ejido* of more than two years led to a forefeit of land rights. By late 1980s, the system accounted for 30,000 *ejidos* with 3.2 million *ejidatarios*, about 70 percent of whom were agricultural producers. The *ejidos* sector controlled the majority of the country's agricultural resources, including approximately half of Mexico's farm land and 70 percent of the nation's forests. The sector was responsible for more than 70 percent of the nation's corn production and 80 percent of bean production (de Janvry et al. 1995). However, by the late 1980s, the sector was obsolete and characterized by productive inflexibility and increasing non-compliance with the sector's legal framework. To allow the *ejido* sector to adjust to economic liberalization, the Mexican government initiated a bold program of agrarian reform in 1992.

Reform of the *ejido* sector was seen as a critical part of the agriculutral sector reform. A change in the land tenure system and greater economic collaboration with the private sector were considered the key ingredients in a reform package that would enable the *ejido* sector to modernize and adjust to the economic reforms. In 1992, the government modified Article 27 of the Mexican Constitution governing all land use in Mexico and the related Agrarian Laws. With respect to the *ejido* sector, there were four important changes. First, the 70 year old agrarian *ejido* reform program came to an end, although the concentration of land in large estates remained forbidden and a legal mechanism was created to distribute individual landholdings in excess of the legal size limits. Second, prohibitions against the sale, rental and sharecropping of parceled *ejido* farm-land and land for human settlement were removed. (Nonetheless, the sale of parceled farm-land to outsiders required the approval of the *ejido* assembly unless the latter had previously approved the passage of the land parcel to *dominio pleno* or "full title" status.) Third, *Ejido* members were prohibited from redefining the boundaries of communal land, or from exercising their traditional right that allows them to assign common land individually (even though it cannot be appropriated individually). And

fourth, economic associations between private sector entrepreneurs and *ejidatarios* were prohibited.

These reforms were expected to have several benefits. They were expected to encourage investment in *ejido* land, as farmers gained greater land security and higher expected future incomes and returns to investments. The reforms also were expected to increase the supply of credit, as farmers could now use their land as collateral for a loan. Thirdly, the ability to engage in rental and sale transactions was expected to promote a more efficient allocation of land among agricultural producers, as land would be passed from less to more productive farmers. Although the state no longer told *ejidatarios* what to grow and how to market their output, the policy also meant that the government would no longer provide widespread technical assistance, input and output subsides, and marketing channels.

The main instrument of the reform was the PROCEDE (*Proceso de certificación de Ejidos y Solares Urbanos).* As *ejido* land became tradable, the PROCEDE system helped to resolve boundary conflicts, regulate land tenure, and property right certificates were issued to members of the *ejidos.* The program, which started in 1993, allowed *ejidatarios* to choose their property rights regime, delineate *ejido* boundaries, and measure individual plots. Eventually certificates were issued to individuals for individually owned plots of land (including house plots) and communally managed lands. PROCEDE also played an important information gathering role: all communities had a legal land situation diagnostic completed. Overall, 2.9 million agrarian subjects received their titles and certificates, and 57 million hectares of land were measured and mapped.

Many positive outcomes have been attributed to PROCEDE: equity through increased land access for *ejidatario* households and for about 1 million *avencindados* and *posesionarios* households that previously had no property rights; conflict resolution and social peace in rural areas; improved governance and transparency at the grassroots level; improved access to common property resources; permissible participation in off-farm labor markets; and improved functioning of land markets. A cost-benefit analysis of the program suggests that, although the costs were not inconsequential, the program was justified on economic grounds (World Bank 2001).

Changes in price support and other mechanisms

Significant reforms in price support mechanisms were initiated in the late 1980s and have continued through to the present. In 1988-89, guaranteed prices for wheat, sorghum, barley, rice and oilseeds were eliminated, although a similar system of agreement prices was in place

for many of these crops between 1992 and 1995. Price subsidies for corn and beans, due to be phased out gradually in the early NAFTA years and replaced with a system of direct income support payments (PROCAMPO), were eliminated by the currency devaluation in late 1994. At the same time, the PROCAMPO program was introduced. The Mexican state withdrew from procurement and marketing functions (except for corn and beans, although the government sharply reduced its involvement after the 1994-95 currency devaluation). Input subsidies on seeds, fertilizer, pesticides, machinery and diesel fuel were partly eliminated. An input subsidy on electricity for groundwater pumping is the only major input subsidy that remains in place. The current Mexican President has pledged to keep this input subisdy in place throuhg to 2012.

The abolition of CONASUPO

In the past, a key player for the government in agricultural policy was the state agency CONASUPO (Yuñez-Naude 2000). The dismantling of this agency provides a sketch for the diminishing role of government intervention in the agricultural sector.

From its creation until the macroeconomic crisis of 1982, CONASUPO'S was a growing agency: its subsidiaries grew, and new ones were created. The agency's activities included the processing of grains, oils and milk powder to produce animal feed and consumer goods such as corn, flour, wheat, pasta, edible oils and fluid milk. CONASUPO managed retail shops selling basic foods to the rural and urban poor, and it was also involved in the trade of fertilizer and improved seeds and peasant training programs.

CONASUPO bought a significant amount of maize and other products from producers at national guaranteed prices and it imported maize at international prices to be sold to regional millers at different prices. A substantially lower price was granted to millers in the Federal District. Transportation and handling expenses were absorbed by the agency (Larson 1993, p. 4).

CONASUPO's functions began to be reduced at the beginning of the 1980s. From 1991 to 1999, price interventions by CONASUPO were limited to beans and corn. Subsidies for inputs such as seeds, fertilizer, pesticides, machinery and diesel fuel were dismantled. An exception was subsidized electricity for groundwater extraction, which was not eliminated. Along with several other governmental agencies, CONASUPO's financial support subsidiaries were privatized, dismantled or transferred to farmers. By 1999 the abolition of CONASUPO was practically complete.

Until 1989, CONASUPO purchased part of the domestic production of each of Mexico's twelve "basic crops". In 1996, after a sharp decrease in the international price of corn, Mexico initiated an intermediate scheme for price fixation, whereby the domestic price was set at a base price at the regional level. The base price was somewhere between a guaranteed price and the international price. In the winter season of 1996-97, the price supports scheme for corn changed. Corn and beans where bought in the production zone by CONASUPO at "indifference prices," which varied depending the region. Under this scheme, CONASUPO became a last-resort buyer of white corn for human consumption, granting purchases of corn to those farmers who could not obtain a price higher than the indifference price in the private sector**.**

The quantity of domestic production purchased by CONASUPO declined in line with its decreasing role in domestic corn and bean markets: CONASUPO bought about 41 percent of the domestic supply of corn in 1993, 31 percent in 1994, but only 12.5 percent by 1998. In 1991, the Marketing Agency (ASERCA) assumed the role of CONASUPO in supporting producers through price interventions. In the case of corn, the continuation of the policy of guaranteed prices applied by CONASUPO meant increasing market price support each year from 1989 to 1993. (Yuñez-Naude 2000).

Mexican rural financial markets

The rural financial markets are comprised of organized formal institutions as well as informal lenders (trade-lenders and moneylenders). In Mexico, the latter cover a significant part of the market and are characterized by high interest rates. Government intermediaries and private commercial banks are the country's main formal lenders. By the mid-1990s, rural entrepreneurs had only limited access to financial services, and markets were considered either not competitive or highly inefficient (World Bank 1995). The main government development institutions in the financial sector are BANRURAL (Bank of Rural Development--*Banco Nacional de Crédito Rural*-- replaced by Rural Financier-*Financiera Rural*-- in 2003, see below) and FIRA (Trusts Related to Agriculture--*Fideicomisos Instituídos en Relación con la Agricultura*). BANRURAL was created in 1975 through the merger of three public banks: *Banco Nacional de Crédito Ejidal, Banco Nacional Agropecuario* and *Banco Nacional de Crédito Agrícola*. Its objective was to provide credit to low-income agricultural producers unable to provide collateral. BANRURAL comprised 12 regional banks and 1 national bank located in Mexico City. Before 1995, this institution

operated in a complex way providing massive credits to small farmers, distributing production inputs, buying products and participating in an insurance system.

On the other hand, FIRA (*Fideicomisos Instituidos en Relación con la Agricultura*) operates as a discount window for first-tier lenders to discount their working capital and investment credit to low and medium-income producers (Carillo 2001). After the 1988 liberalization, the government sold commercial banks, keeping only development institutions.

This reform forced BANRURAL and FIRA, among others, to operate in a more efficient and competitive way towards private intermediaries, thus generating important reforms within them. The total amount of loan to the sector reduced in real terms since the mid-1980s and even more after the 1995 financial crisis. Moreover, the participation of the agricultural sector in the financial markets also decreased sharply . Regarding credit types, more than 50 percent of the loans are short-term loans (*Préstamos de Avío*), and the rest are middle and long-term loans (*Préstamos Refaccionarios*). By 2003, BANRURAL experienced financial problems with about 60 percent of its outstanding loans unpaid, and it was replaced by *Financiera Rural,* which is organized with the same objectives as FIRA, although it can offer loans directly to producers (OECD 2007). In turn, FIRA´s activities have expanded, and it now channels resources also to newly created rural financial intermediares whereas the new system PAASFIR (which is the Support Program for Accessing the Financial Rural Sector-*Programa de Apoyo para Acceder al Sistema Financiero Rural*) provides additional cash guarantee over and above guarantees supplied by FIRA.

In 1990, ‘solidarity funds’ for production were created in order to assist farmers excluded from coverage by BANRURAL. The production funds consisted of payments made directly to producer who were to reimburse the money received into a community fund. PRONASOL (*Crédito a la Palabra*) was announced in President Salina’s inaugural address on 1 December 1988. It was an umbrella social welfare agency that, besides giving credits to poor farmers and basic infrastructure, sought to develop health, education, housing, nutrition and employment. PRONASOL consolidated programs located in different government agencies in order to coordinate their operations in a more cost-effective manner.

The rural poor and access to financial markets

Access to rural financial services for low-income households remains problematic (World Bank 2001, OECD 2007). As a consequence of years of subsidized, directed credit through government banks, access to credit remains a major bottleneck for low income rural

households seeking to grow their way out of poverty. A lack of financial discipline exacerbated by periodic debt forgiveness resulted in poor recovery rates from subsidized, directed programs which tended to benefit the better-off anyway. Rural financial markets have remained shallow, segmented and "personalized." Few lenders operate, and at high costs. Non-bank financial intermediaries (NBFD), however, were resilient in the face of the mid-1990s financial crisis. But they too have been constrained by an inadequate legal, regulatory and supervisory environment.

As a result of these factors, there is a generalized lack of public confidence in the banking sector and NBFD. This lack of confidence is costly both to private individuals and in terms of Mexico's development. The poor do in fact save, but in high-risk forms that yield low returns. For example, most savings are in the form of highly liquid and insecure physical assets such as livestock that suffer high mortality rates: saving rates are 56 percent in chickens and 40 percent in pigs. However, according to a recent survey, most farmers reported that they had difficulty selling their livestock in times of emergency. They had to borrow and then repay the loan by selling the livestock later. Other important forms of lending to the rural poor are informal lending to friends etc., and through savings associations. Informal lending has a 20 percent arrears/default rate. *Tandas* (savings societies) report a 6 percent non-compliance rate (members who cease to contribute once they have taken out their loan). The major forms of savings scored low in terms of liquidity, return and safety.

Programs to assist in managing the transition

The government of Mexico implemented major rural programs to assist producers to better manage the transition to a liberalized and competitive system (World Bank 2001, OECD 2007). The most important programs were: *PROCAMPO* (that started in fall/winter 1993-94), *ALIANZA PARA AL CAMPO* (1996), *ASERCA* (marketing subsidies that started in 1991), and *SEDESOL* (infrastructure subsidies in poor areas). Another important program that channeled resources to the poorest producers was the *CREDITO A LA PALABRA* administered also by *SEDESOL*. Altogether these programs not only contributed to support the income of farmers facing competition from abroad, but they also promoted the use of commercial inputs. This led to a rise in the productivity of at least some of Mexico's farmers (Yunez-Naude 2002). Nonetheless, since many of the current subsidies cover a limited range of traditional crops,

they might not be favoring a change in production towards Mexico´s comparative advantages (OECD 2007).

ASERCA

ASERCA (*Apoyos y Servicios a la Comercialización Agropecuaria*), created in 1991, partially substituted for CONASUPO's price and direct market interventions by subsidizing marketing activities for non-corn and beans producers and by giving direct income transfers to farmers producing basic crops. The most important interventions were marketing subsidies and the promotion of production contracts. The interventions had four main objectives: to promote the development of regional grain markets while ensuring the absorption of marketable surpluses; to reduce the price uncertainty that characterizes these crops; to help eliminate imbalances in production between the country's regions; and to develop appropriate channels of information about prices, areas planted and other key information that may help farmers make optimal management decisions.

To accomplish these objectives, ASERCA's marketing subsidies covered the difference between a "reference" price established in the previous year and the actual market price. Under this program, the government and producer organizations negotiated a certain price above that which would prevail if the commodity was imported. Then, in a public bid, interested buyers of such crops would ask for a subsidy to commit to buy a certain amount of the crop at the negotiated price. Over 90 percent of the program's commercialization subsidies were allocated to wheat, maize, and sorghum. Subsidies were directed mainly towards regions with a large share of these crops, and were awarded—up until 2000—to marketing firms.

Until 2001, the scheme was increasingly criticized, mainly because a few large buyers asked for subsidies that were too high, relative to prevailing marketing costs, and because it was difficult to guarantee that the negotiated price was being paid to the producer (Rosenzweig 2003). Consequently, the program changed in 2001 and subsidy payments were made directly to producers who enrol in the program in certain designated States identified as having an historical surplus of one of the subsidized products. In 2003, the previous focus of ASERCA´s operations only on "States with surplus harvests" was also changed. The program now addresses its efforts to "producers with surplus production", disregarding the State where the producer has his/her operations. Moreover, the practice of announcing an agreed price for each season on a year-by-year basis was replaced by a multi-year commintment over

a five-year period for each product in the program. This new approach is known as "Target Income" (*Ingreso Objetivo*), and operates as a deficiency payment. This scheme pays only up to a government-set maximun yield per hectare that is determined for each region (OECD 2007).

Notwithstanding the reforms in the 2000s, it is likely that the ACERCA subsidy program undermines the general objective of trade reform in Mexico, namely to create appropriate incentives for producers to shift from grains to vegetables and fruits (World Bank 2001). This is because ASERCA covers substantial portions of the national production of grain crops. For example, in 1999 it covered 32 percent of the summer/spring production, and 47 percent of the fall/winter production of maize. Since 1996, ASERCA's coverage of fall/winter sorghum production in Taumalipas (the most important State for sorghum) varied between 86 and 90 percent. For wheat, ASERCA's intervention covered almost 100 percent of production during the 1998/99 fall/winter cycle. The consequences of these interventions in grain markets are particularly troublesome in view of the fact that the prices determined by ASERCA generally exceed those that would have prevailed in a completely liberalized environment. In all, ASERCA's intervention impeded an adjustment in the production pattern of regions based on local comparative advantage.

Another major problem with the program is that the fixing of producer prices that do not adjust according to the development of the crop cycle, eliminated the incentive to develop local storage facilities that producers could use to sell their products with the most profitable timing.

There is ample evidence that a major problem in converting from grains to vegetables and fruits lies in the marketing stage. Rather than concentrating on supporting resources on grains, ASERCA should have concentrated on promoting and developing the marketing of perishables in order to attract resources towards their production. It is hoped that the new system currently developed might overcome several of these distortions.

PROCAMPO (Programa de Apoyos Directos al Campo-Farms Support Payments Program)
A major reform in Mexican state intervention in staple production was implemented in parallel with the creation of ASERCA. It consisted of the elimination of guaranteed prices that CONASUPO had traditionally given to producers of nine crops: cottonseed, grain, barley, rice, soybeans, sorghum, safflower, sunflower and wheat. To facilitate the transition from price supports to free markets, PROCAMPO — a partially "de-coupled" income

support program for all farmers producing basic crops — was implemented in 1994. Under the management of the Ministry of Agriculture, PROCAMPO provided cash transfers to 90 percent of all Mexican farmers to support grain and oilseed producers. The transfers were provided on a per hectare basis. PROCAMPO's mission from its inception was not to support production of specific commodities, but rather to support farmer income (Baffes and Meerman 1997). Nonetheless, in practice, payments were linked to grain and oilseed production.

PROCAMPO's main objective was to compensate producers for the elimination of deficiency payments, thus compensating agricultural producers for the loss of revenue caused by the liberalization of agricultural trade and the removal of price supports in the grain sector. It was conceived of as a 15 year program to be phased out by 2008. Eligibility depended on total hectares planted of nine key grains and oilseeds in the three agricultural years prior to and including August 1993. The nine crops — corn, beans, rice, wheat, sorghum, barley, soybeans, cotton, and cardamom — were all previously covered by the CONASUPO deficiency payments schedule. The program was expanded in the early years to apply to land that was planted and kept for livestock or forest activities, or that was covered by an eligible ecological project. No new beneficiaries were added after 1994. The scheme approved eligible land parcels, not particular farmers, and therefore payments went to whoever is planting at a particular property. Also, payments were set for each cropping season, so that payments could be made twice a year where irrigation made two crops per year possible.

The PROCAMPO program was important because of both the number of producers it reached and the large expenditures involved. By 2005, expenses for *PROCAMPO* amounted to about US$1.4 billion (or 0.2 percent of GDP), and the program benefited 2.4 million producers who owned 12 millions hectares of land in about 3.5 million land parcels. It is estimated that *PROCAMPO* contributed to about 8 percent of *ejidatario´s* household income, although it could be as high as 40 percent for low-income families. A modification to the scheme in 2001 gave preferencial treatment to poor producers: those with less than five hectares of rain fed land received payments in advance of planting and those with less than one hectare received payments corresponding to a complete hectare. In 2001, the scheme also allowed financial institutions to make advance payments to producers who present an investment plan equal to the net present value of future entitlements.

SEDESOL (*Secretaria Desarrollo Social*)

The purpose of SEDESOL is to support programs whose main content is poverty eradication (World Bank 2001). The agricultural sector components of two programs of importance—PRONASOL and *CREDITO A LA PALABRA*—were reviewed above under the discussion of 'rural financial markets'. PRONASOL aimed to promote social infrastructure at the municipal level. The program was initiated in the early 1990s and was characterized by high variability in terms of effectiveness, sustainability and targeting. There were a number of reformulations of the program.

CREDITO A LA PALABRA had the objective of supporting with low-interest and collateral-free credit small producers on resource-poor rain fed lands. Producers were typically cultivating grains for home consumption. To be eligible they had to demonstrate a legitimate entitlement to the land they were cultivating and that they were stable residents in their community. The program started in 1989 and was expanded in 1990 into the program of Solidarity Funds for Production *(Fondos de Solidaridad para la produccion).*These Funds then provided the seed capital for *Cajas Solidarias* — non-bank financial intermediaries — created in 1992. The *cajas* emphasized savings mobilization. The *cajas* savings/equity ratio rose from 0.09 in 1995 to 0.33 in 1999. It encompassed producers in both the private and social sectors and covered up to three hectares of land per producer. At the peak of its coverage, the *Credito a la Palabra* was used by 760,000 producers cultivating 1.4 million hectares. The states where most of the beneficiaries were located were Oaxaca, Chiapas, Michoacan, Veracruz and Guanajuato. The program had an insurance component that facilitated the writing off of loans in case of harvest failure. In 2000, the amount loaned was MXP 550 per hectare. While the *cajas solidarias* achieved an extensive outreach in marginal areas, their main challenge is financial sustainability as arrears have risen from around 4 percent of the portfolio in 1994 to around 22 percent in 1999.

Finally, *SEDESOL* participated in PISO, a program that aimed to promote social infrastructure at the municipal level and support an orderly and rational urban expansion in peri-urban areas.

ALIANZA (Alianza para el Campo-Alliance for the Country Side)

The ALIANZA program was introduced in 1996 to provide matching grants to agricultural producers to promote investment in infrastructure, decrease the incidence of animal diseases, and support an integrated development of rural communities. ALIANZA was decentralized, with co-financing required from state governments and beneficiary producers. It included

several sub-programs. The most important were ferti-irrigation, mechanization, rural equipment, pasture improvement and *kilo por kilo* (which provided growers with one kilogram of certified seeds for the price of one kilogram of normal seeds). Together, these programs accounted for more than 50 percent of ALIANZA'*s* budget. State goverments were responsible for the implementation of the program at the local level. Most of the programs required a matching contribution by the beneficiary (World Bank 2001).

The ALIANZA program was revised in 2003 (the name changed to *Alianza Contigo*) to serve as an umbrella for around 100 programs, which can be grouped into three categories: capitalization programs, product chain enhancement programs, and the creation of technologies for supporting agri-food system (OECD 2006). This was complemented by the 2001 Law for Sustainable Rural Development (*Ley de Desarrollo Rural Sustentable*), which represented a shift from decades of a one-sector agricultural policy to a policy that aims to integrate the actions of several ministries and different levels of government (federal, statal and municipal). The law established a federal horizontal coordination body specifically for rural policy (the Inter-Ministerial Commission for Sustainble Rural Development, CIDRS) and a constitution of participatory bodies for civil society (Councils for Sustainable Rural Development). It also elaborated on a Special Concerted Program for Rural Development (PEC), which evolved into scheme to have a rural budget appended every year to the federal budget (OECD 2007).

More-recent programs

A special program to support electricity and fuel use in agricultural activities was established in 2002. This program introduced two new prices for electricity: a single subsidized price that applies all the time, and a lower price for pumping at night. These prices were in addition to two exisiting prices for electricity for agricultural pumping (one for low tension and one for medium tension). In 2003, a preferencial pricing scheme (with some quantity restrictions) was inititied for diesel to fuel machinery and equipment used in agricultural and livestock production.

The Progan Program *(Programa de Estímulos a la Productividad Agrícola* or Livestock Productivity Improvement Program) was created in 2003, and consists of a payment per animal over four years. Payments start at about US$28 in the first year and increase each year by about US$10. To be eligible for the subsidy, producers must register

their cattle in the National System of Individual Cattle Identification (SINIIGA). The system helps to strengthen sanitary control in the cattle sector.

Expenditure on agricultural programs

Figure 2 shows the breakdown of government annual expenditure on agricultural policies over the past ten years. Since 1994, PROCAMPO payments have represented between 31 percent and 44 percent of SAGARPA´s budget. Expenditure on ALIANZA and ASERCA have increased in importance over the period. These three programs together represented about two-thirds of SAGARPA's total expenditures over the last five years. In real terms, total expenditures on the three major programs had a clear upward trend between 1995 and 2002. It plateaued in 2002 at about $2.6 billion (2005 US dollars), equivalent to about 10 percent of Mexico´s agricultural GDP (Figure 3).

Summary

The main agricultural policy measures used in Mexico since the mid-1980s are summarized in Table 3. They were initially characterized by direct market interventions, with domestic prices in general being kept above world prices by means of tariffs and import quotas. The system began to change in 1991 to one where the government provided direct income payments and region-specific marketing supports. Border measures were progressively liberalized, and the previous extremely high tariffs were converted to tariff-quota schemes. The implementation of NAFTA in 1994 implied a *de facto* liberalization for the most important agricultural goods: the in-quota tariff was in general set to zero, and since it was not filled that effectively was the marginal tariff. By 2004, almost all the main agricultural products had import tariffs equal to zero, and the NAFTA agreement implementation will complete the liberalization process for remaining goods by 2008. Thus, agricultural policies in Mexico have moved from being predominantly market price supports that increased domestic producer prices to predominantly budgetary payments (OECD 2006).[2]

[2] While the new approach increased the sector's exposure to market prices, a recent detailed study on US-Mexican agricultural price convergence showed that the relatively large number of periods required for the domestic price to adjust to 95 percent of the international price change (20 months for wheat, 33 months for maize and 77 months for soybean) did not shorten under the new agricultural policies (Yunez-Naude and Barceinas 2003).

Estimating rates of distortions to agricultural incentives

The present project's methodology (Anderson et al. 2008) defines indicators of policy-induced agricultural price distortions (as distinct from market factors, infrastructural investments and services that change prices and incentives more generally). The focus is on government-imposed distortions that create a gap between domestic prices and what they would be under free markets. Since it is not possible to understand the characteristics of agricultural development with a sectoral view alone, the project's methodology not only estimates the effects of direct agricultural policy measures (including distortions in the foreign exchange market), but it also generates estimates of distortions in non-agricultural sectors for comparative evaluation, thereby considering the overall policy impact on farmer and food consumer incentives.

The estimates below are similar in nature to the producer support estimates and consumer subsidy equivalents (PSEs and CSEs) generated by the OECD for Mexico, but we depart from their methodology in four important ways. First, instead of taking border prices as the relevant international prices, we adjust border prices for freight, port, insurance, financial costs, handling, and transportation charges to main domestic markets. Second, taking into account new estimates of the way in which Mexican regional markets work, we use a weighted average of farm gate prices adjusted for transportation costs to main markets as the relevant domestic price for comparison (instead of using the simple national average of domestic prices). Third, unlike the OECD study, we do not consider the PROCAMPO and PACE payments as crop-specific payments but rather classify them as general non-product-specific payments. This is because these payments are similar in nature to decoupled payments. Fourth, our estimates use the international (undistorted) price rather than the domestic price as the base to calculate the rate of distortion. Specifically, the Nominal Rate of Assisstance (NRA) is estimated as NRA=(domestic price minus border price)/border price. The OECD calculates this distortion—which it calls Market Price Support (MPS)—as a percentage of the domestic (distorted) price: MPS=(domestic price minus border price)/domestic price.

In this chapter, and like the OECD, we use the official exchange rate in all our calculations, since for most of the period we analyze the black market premium was very low. Even between 1990 and 1994 the black market premium was only about 3 percent on

average, and since 1995 it has been zero. The premium was about 26 percent between 1983 and 1986, 6 percent in 1987, and then rose to 17 percent during 1987 to 1989. It is important to mention that the real exchange rate showed high variations during the period covered. By the end or our sample, the real exchange rate of the Mexican Peso, calculated by the Bank of Mexico against a basket of currencies, was about 15 percent below the average level for the last twenty years. But compared with the average for the last twenty years it was 43 percent above in 1995, 25 percent in 1996 and only 5 percent in 1997 (and 48 percent above in the 1986-1988 period). We should expect relatively lower levels of protection in those peak years.

Product coverage

The goods covered in this study represent more than two-thirds of the total value of agricultural output in Mexico (Table 4). Annual crops represents between 19 and 24 percent of total; coffee and sugar cane represent between 5 and 7 percent, and animal products between 38 and 42 percent. Beef, maize and milk are the most important products in terms of the value of output. The most important products in terms of final household food consumption expenditure are milk and meat (Figure 4).

Nominal rate of assistance (NRA) to farmers

Our estimates of the NRA for the years 1979-2004 for the products covered here are summarized in Table 5. For comparative purposes, so too are the NRA equivalents of the OECD's PSEs for the period since 1986. Aggregates for exportables, import-competing products and all covered products are also shown, using as weights the value of production at undistorted prices. Like the OECD's PSE, the NRA measure incorporates the different types of assistance for inputs received by the sector, such as fertilizers, pesticides, credit, fuel and electricity, seed, machinery and miscellaneous payments.

The NRA estimates for exportables are negative over the period we analyze except occasionally for beef, indicating that exportables in general have been taxed. The tax was very high on coffee and tomatoes, exceeding 40 percent in some years. The five-year averages of the NRA for importables are positive over the period, indicating that in general import-competing industries have been protected. There is a large degree of variation in the

level of assistance to specific products, however: by 2000-04, some important importable products had almost zero or even negative NRAs (barley, maize, sorghum, soybeans, beans and eggs) while products such as wheat, rice, milk, sugar cane and chicken meat had relatively high NRAs (between 40 and 80 percent).

The NRA for importables was lowest in 1995-99, following the strong peso devaluation – having been relatively high in the first half of the 1990s because of overvaluation of the currency; but in the present decade it has risen somewhat, to an average of 9 percent. The difference between assistance to exportable versus import-competing covered products is illustrated in summary form on an annual basis in Figure 5, where it can be seen that the NRA has been trending downwards in recent years due to falling direct assistance to both importables and exportables.

The inclusion of guesstimates for non-covered products to the weighted average for all covered products alters the numbers a little. They are altered further when the steady increase in non-product-specific subsidies, discussed above, is added to get the total NRA for all agriculture. For example, in recent years the PROCAMPO, ASERCA, and PACE programs had grown to more than 4 percent of the total undistorted value of agricultural production. That is, so-called decoupled non-product-specific subsidies have added 4 percentage points to the aggregate NRA, raising it by one-third. Together those adjustments bring the estimated NRA for the whole sector to 12 percent in 2000-04 (top half of Table 6).[3]

The final row in the top half of Table 6 reports an index of trade bias in agricultural policies. The negative sign indicates that the composition of assistance to farms has an anti-trade bias, and its size indicates that the bias has persisted over time, being only slightly smaller this decade than in the latter 1980s. This implies the country still has some way to go before it is fully exploiting its comparative advantages within the farm sector.

Relative rate of assistance and anti-trade bias for agriculture

Table 6 also shows the weighted average NRA for just tradable agricultural industries, and also for non-agricultural tradables. Following the Anderson et al. (2008) methodology, the latter was generated by subdividing non-agricultural industries into exportables, nontradables and import-competing sectors. We assume the NRA is zero for exportables and nontradables,

[3] The pattern of distortions we estimate across time is similar to that calculated by OECD (compare the left- and right-hand sides of Table 5), but there are important differences for some goods. In particular, since we add additional costs to the border price, our NRA has been a little lower than the OECD's during the past 15 years.

and we assume the NRA for import-competing non-ag industries is given by the trade restrictiveness index estimated by Kee, Nicita and Olarreaga (2006). It is then possible to to generate estimates of the Relative Rate of Assistance (RRA), shown in the lower part of Table 6 and, in annual form, in Figure 6. Like the NRA, the RRA has fluctuated considerably. If the period just before the 1994 devaluation is ignored, the RRA has gradually risen over the past three decades from slightly negative to slightly positive, with the five-year averages moving from -4 percent in the early 1980s to +5 percent in 2000-04.

The previously mentioned negative correlation between the real exchange rate and the NRA for agricultural tradables is clear from Figure 7. That suggests if the currency were to be left to float and find its own level, there may be less fluctuation in the NRA in future.

Consumer Tax Equivalent for food

Table 7 shows the consumer tax equivalent (CTE) for food products, derived from the CSEs generated by the OECD. The pattern is somwhat similar to that of NRAs, with the CTE negative in the latter 1980s, slightly positive in the latter 1990s, and even larger early this century but falling over the past three years as assistance to agriculture has moved from market price support to more-direct, somewhat decoupled assistance. As in many countries, sugar is by far the most taxed food item for consumers.

Conclusions

Economic policy developments affecting Mexico's agricultural sector since the late 1980s, and in particular since the late 1990s, has shown a clear departure from the interventionist schemes of the past. By the end of our sample period, and for agricultural products covered in this study, the NRA was 12 percent. Although it appears that assistance increased when compared to the 1995-99 period, this average is less than half that of 1990-94. Importantly, by 2004 more than a half of the assistance to Mexican farmers came from non-product-specific assistance. The current farm income support scheme provides assistance to certain commercial producers of grains and oilseeds only when commodity prices decline. Despite the launching of two new and comprehensive programs for the agricultural sector (*Blindaje*

agropecuario-Agri-food Armour in 2002 , and the *Acuerdo Nacional para el Campo*-National Agreement for the Countryside in 2003), the size and composition of SAGARPA's activities is similar to what prevailed in previous years (Zahniser, Young and Wainio 2005). That is, even under the strong pressure from both small and large producer associations, the government has been able to resist raising those budgetary outlays, and the total budget devoted to the government's activities in agriculture and rural development has been held at about 15 percent of total agricultural gross domestic product (both crops and livestock). Nonetheless, as indicated above, the persistent anti-trade bias in agricultural policies suggests the reforms have not yet greatly favored a change in production towards Mexico´s comparative advantages.

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Table 1: GDP growth and sectoral shares, Mexico, 1980 to 2005

(percent)

	1980-85	1985-90	1990-95	1995-00	2000-05	**1980-2005**
Annual growth						
Total GDP	2.0	1.8	1.6	5.4	2.0	**2.6**
Agriculture	2.3	0.4	0.9	1.7	1.7	**1.4**
Industry	1.1	2.4	0.9	7.3	0.4	**2.4**
Services	2.3	1.8	1.9	5.0	2.7	**2.7**
Sectoral shares of GDP						
Agriculture	6.9	6.9	6.2	6.0	5.4	**6.3**
Industry	26.1	25.7	26.3	27.3	26.7	**26.4**
Services	67.0	67.4	67.4	66.8	67.9	**67.3**

Source: Authors' calculations based on INEGI

Table 2: Area planted by main crop, Mexico, 1980 to 2004

(percent)

	1980-85	1986-90	1991-95	1996-2000	2000-04
Maize	51	50	54	53	52
Wheat	6	7	6	5	4
Forage	15	16	14	18	21
Fruit	1	1	1	1	1
Vegetables	2	3	3	3	3
Industrial crops	4	4	3	3	3
Legumes	15	15	15	15	14
Oilseeds	6	5	4	2	2
TOTAL	100	100	100	100	100

Source: Authors' calculations based on SIAP-SAGARPA

Table 3: Main agricultural policy measures, Mexico, mid-1980s to 2005

	Mid-1980s			1995							2005				
	Price and income support measures			Price and income support measures							Price and income support measures				
	Support Prices		Border Meas-ures	Market Price Support			Direct Payments		Border Measures		Direct Payments				Border Measures
	Guarateed Price CONASUPO	Concer-ted Price		Guarateed Price CONASUPO	Concer-ted Price	PACE marketing subsidy	ASERCA	PROCAMPO	NAFTA	GATT	PROCAMPO	ASERCA	ALIANZA	PROGAN	NAFTA
Maize	x		P	x		X		X	TQ	TQ	X	X	X		TQ*
Beans	x		P	x		X		X	TQ	TQ	X	X	X		TQ
Wheat	X		P					X	T	TQ	X	X	X		Free
Barley	x		P					X	Q	TQ	X	X	X		Free
Sorghum	X		P					X	Free	T	X	X	X		Free
Rice	X		T				X	X	T	T	X	X	X		Free
Soybeans	X		P					X	Free	T	X	X	X		Free
Sugarcane		X	P		x				Q	TQ			X		Q
Coffee		X	P						T	TQ			X		T
Milk			P						T	Q			X		TQ
Beef & Veal			T						Free	T			X	X	Free
Pigmeat			T						T	T			X		
Poultrymeat			P						Q	TQ			X		
Eggs			P						Q	T			X		

Notes: (P): import permits, (T): import tariffs, (TQ): tariff- rate quota. Under NAFTA, original agreed quotas were in general not binding or were increased by the Mexican Government. In 1995, payments were granted for the production of the crops listed in the table plus safflower and cotton. Since the Autumm/Winter 1995/96 crop season, under PROCAMPO farmers may now devote their land to any crop, livestock, or forestry production, or place it in an approved environmental programme. Nonetheless, still by 2004, almost half of the farmers thought that they actually needed to farm *cultivos básicos* in order to receive the subsidy.
ASERCA market development: *Programa Nacional de Apoyos Directos a la Comercialización y Desarrollo de Mercados Regionales*; CONASUP: *Compañía Nacional de Subsistencias Populares*; PROCAMPO: *Programa de Apoyos Directos al Campo*; PROGRAN: *Programa de Estímulos a la Productividad Ganadera*; NAFTA: North American Free Trade Agreement; PACE: *Programa de Apoyo a la Comercialización Ejidal.*

Source: Authors' calculations based on OECD (2006) and SAGARPA.

Table 4: Share of products in total value of agricultural production at distorted prices, Mexico, 1980 to 2004

(percent)

	1980-89	1990-99	2000-04
Annual crops	**23.5**	**23.6**	**19.2**
Barley	0.4	0.4	0.5
Beans	1.7	2.6	2.1
Maize	10.8	12.0	9.6
Rice	0.5	0.3	0.1
Sorghum	3.8	3.0	2.8
Soybean	1.3	0.3	0.1
Tomato	1.9	2.8	2.8
Wheat	3.0	2.3	1.3
Perennial crops	**6.1**	**6.6**	**5.4**
Coffee	2.6	2.5	1.1
Sugar cane	3.5	4.1	4.3
Animal products	**43.9**	**38.0**	**42.5**
Milk	9.8	9.2	9.9
Eggs	4.5	4.2	4.9
Beef	13.9	10.8	10.7
Poultry	6.1	7.2	9.9
Pig	9.6	6.6	7.1
Total	**73.5**	**68.2**	**67.1**

Source: Authors' calculations based on SIAP-SAGARPA

Table 5: Nominal rates of assistance for covered agricultural products, Mexico, 1979 to 2004
(percent)

	Author's results					OECD's results[a]			
	1979-84	**1985-89**	**1990-94**	**1995-99**	**2000-04**	**1986-89**	**1990-94**	**1995-99**	**2000-04**
Exportables [b]	**-27.6**	**-21.3**	**15.8**	**-8.2**	**-12.5**				
Beef	-17.5	-7.6	37.7	11.6	-2.7	-13.7	26.7	7.7	3.3
Coffee	-63.8	-49.7	-23.6	-28.1	-33.8	-52.5	-10.2	-7.2	0.0
Tomato	-24.2	-45.8	-23.1	-38.6	-37.1	-8.1	-4.3	-17.1	3.5
Import-competing [b]	**14.7**	**13.9**	**35.9**	**3.8**	**19.5**				
Barley	7.1	-12.7	28.1	-14.3	-6.8	1.3	57.6	12.8	13.5
Beans	44.2	-17.6	-10.8	-13.2	-0.4	-28.4	17.4	-2.7	40.2
Eggs	-1.5	-6.3	2.2	-16.1	-15.7	0.0	2.9	0.0	0.0
Maize	20.1	23.7	27.9	-12.5	-2.9	28.1	62.6	5.6	29.6
Milk	137.3	145.6	175.0	60.5	85.7	209.3	55.7	27.5	38.5
Pigmeat	-21.6	-20.4	6.2	-4.4	3.2	-21.6	3.7	-3.1	10.7
Poultry	143.8	96.2	114.2	17.8	47.7	34.1	56.6	15.9	28.1
Rice	-7.3	-5.4	20.1	3.6	37.5	-33.7	4.8	2.0	32.8
Sorghum	-1.0	1.4	-3.9	-14.8	-11.5	21.4	29.2	8.2	16.7
Soybeans	38.5	38.6	26.1	-5.1	-2.7	4.5	17.2	2.5	10.8
Sugar cane	-4.4	1.0	66.1	48.2	81.5	3.8	78.3	47.3	66.6
Wheat	5.2	38.4	61.5	25.0	61.2	-19.3	23.5	4.4	22.4
Total of covered products [b]	**0.7**	**1.1**	**28.8**	**0.1**	**9.2**	**-2.3**	**31.9**	**7.2**	**21.4**
Dispersion of covered products [c]	69.5	65.7	56.0	33.2	41.3	67.0	32.6	20.0	21.3
% coverage at undistorted prices	79	79	72	76	73	74	69	69	68

[a] OECD NRA defined as 100*(NPC-1). [b] NRAs including product-specific input subsidies.
[c] Dispersion is a simple 5-year average of the annual standard deviation around the weighted mean of NRAs of covered products.
Source: Authors' spreadsheet and conversion to NRAs of PSEs from OECD (2007)

Table 6: Nominal rates of assistance to agricultural relative to non-agricultural industries, Mexico, 1979 to 2004

(percent)

	1979-84	1985-89	1990-94	1995-99	2000-04
Covered products [a]	0.7	1.1	28.8	0.1	9.2
Non-covered	10.7	9.9	31.4	3.3	2.6
All agricultural products [a]	2.9	3.0	29.5	0.8	7.4
Non-product-specific (NPS) assistance[b]	0.0	0.0	1.3	3.4	4.2
Total agricultural NRA (incl. NPS)	**2.9**	**3.0**	**30.8**	**4.2**	**11.6**
Trade bias index[c]	-0.45	-0.39	-0.27	-0.23	-0.34
Assistance to just tradables:					
All agricultural tradables [b]	3.0	3.0	31.2	4.2	11.8
All non-agricultural tradables	7.4	4.0	5.8	3.2	6.8
Relative rate of assistance, RRA [d]	**-4.2**	**-1.1**	**24.1**	**1.0**	**4.7**

[a] NRAs including product-specific input subsidies.

[b] NRAs including product-specific input subsidies and non-product-specific (NPS) assistance

[c] Trade Bias Index is TBI = $(1+NRAag_x/100)/(1+NRAag_m/100) - 1$, where $NRAag_m$ and $NRAag_x$ are the average percentage NRAs for the import-competing and exportable parts of the agricultural sector.

[d] The RRA is defined as $100*[(100+NRAag^t)/(100+NRAnonag^t)-1]$, where $NRAag^t$ and $NRAnonag^t$ are the percentage NRAs for the tradables parts of the agricultural and non-agricultural sectors, respectively.

Source: Authors' spreadsheet

Table 7: Consumer tax equivalent[a] for food products, Mexico, 1986 to 2005

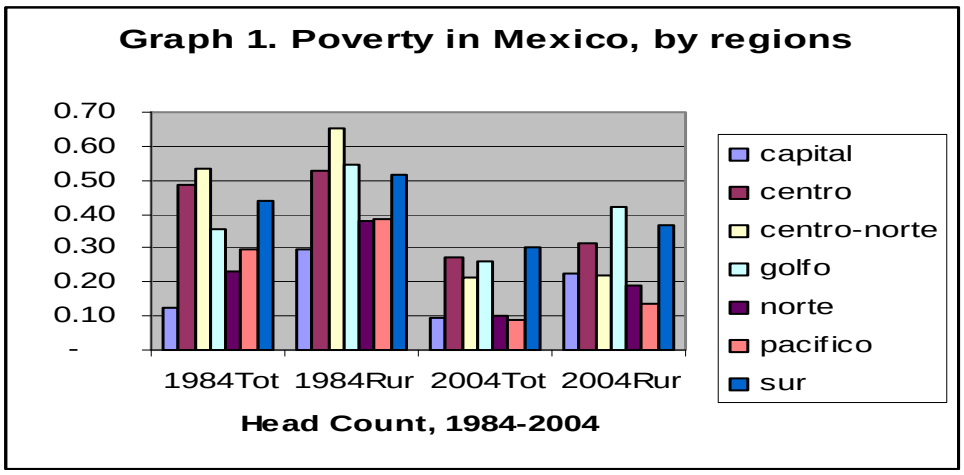
(percent)

	1986-89	1990-94	1995-99	2000-05
Beef	-14	26	7	3
Coffee	-66	-18	-18	0
Tomatoes	-8	-3	-21	5
Barley	1	44	7	11
Beans	-13	25	-3	32
Eggs	0	3	0	0
Maize	-2	25	-14	13
Milk	129	19	5	26
Pigmeat	-21	5	-3	8
Poultry	33	53	15	22
Rice	-51	1	4	4
Sorghum	0	-5	-3	0
Soybeans	-4	8	12	2
Sugar	4	79	86	117
Wheat	-54	-17	-6	1
Total CTE	**-8**	**21**	**4**	**17**

Source: The negative of the OECD's (2007) Consumer Support Estimate (CSE), expressed at undistorted prices

Figure 1: Poverty by regions, Mexico, 1984 to 2004

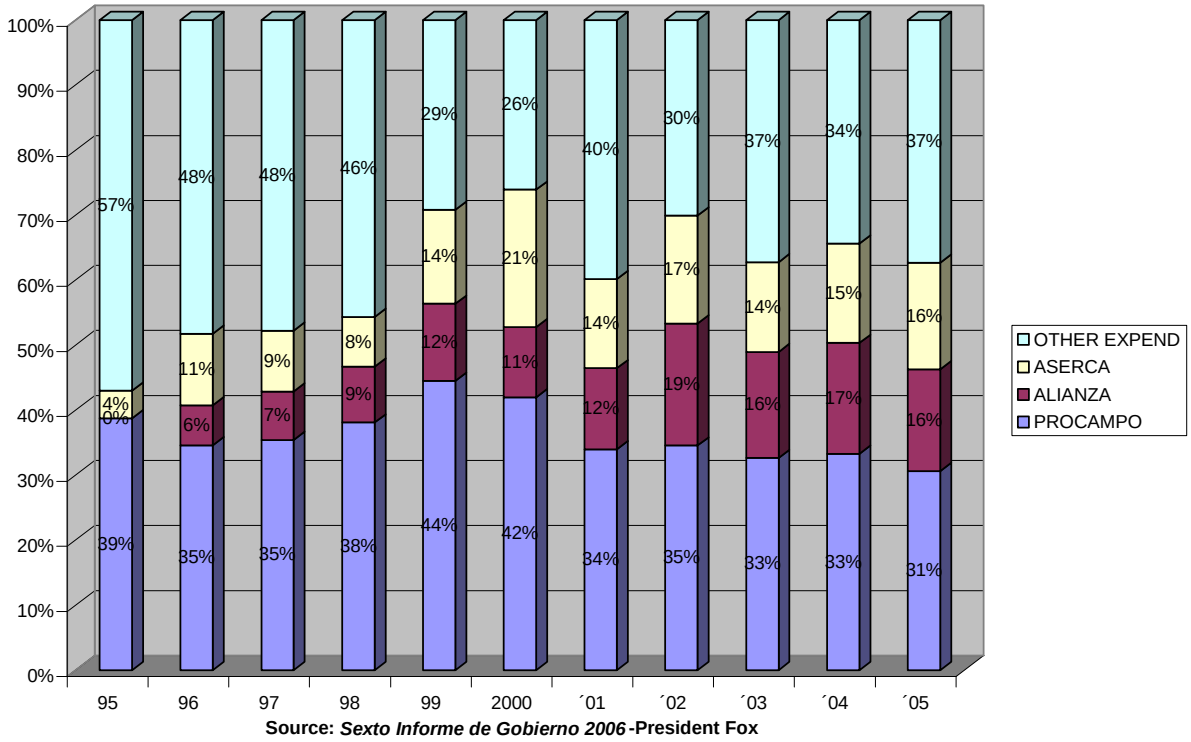
(proportion of relevant group)



Source: Authors' spreadsheet

Figure 2: Shares of main farm programs in SAGARPA's budget, Mexico, 1995 to 2005 (percent)

Figure 3. Share of main programs in SAGARPA´s Budget

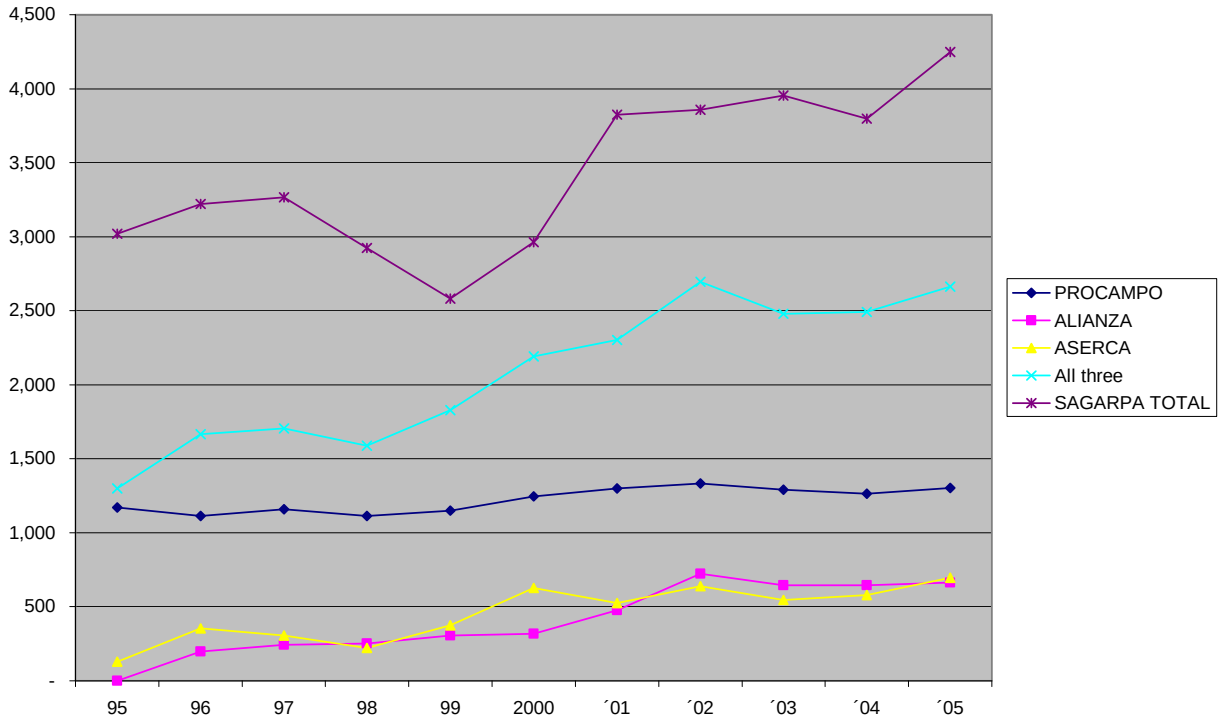


Source: ***Sexto Informe de Gobierno 2006*** **-President Fox**

Figure 3: Government expenditures on main farm programs under SAGARPA, Mexico, 1995 to 2005

(2005 US$ millions)

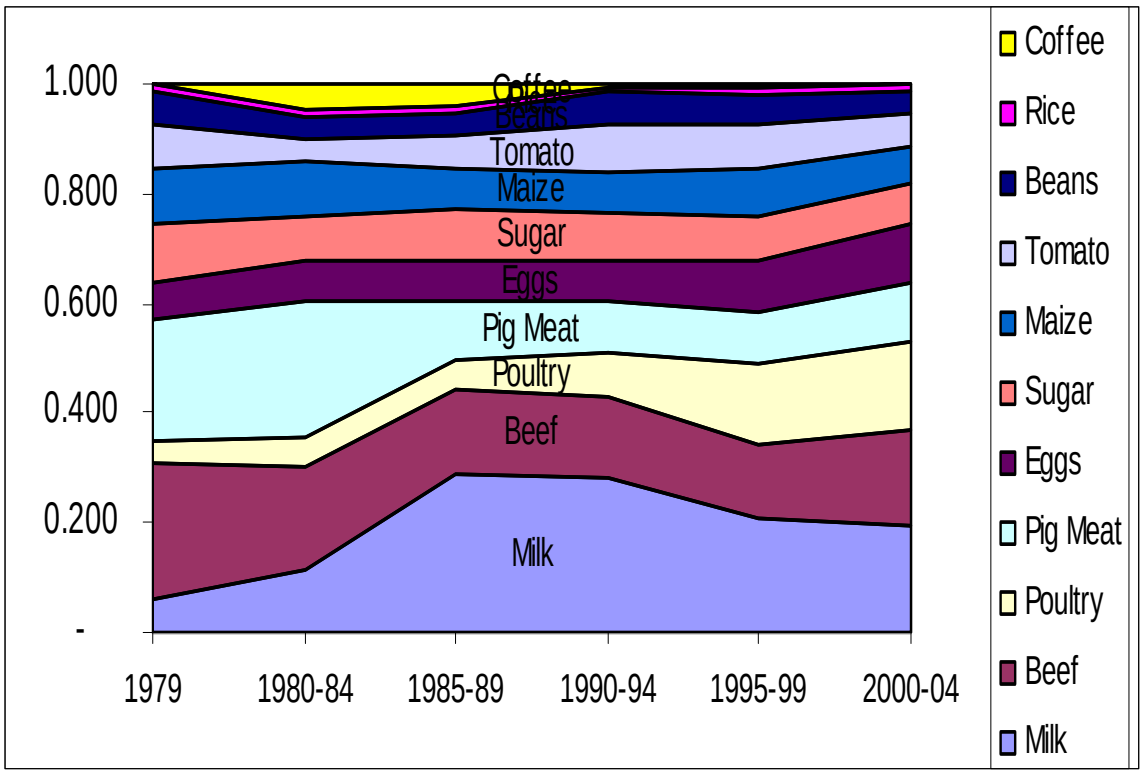
Figure 4. Government Expenditures: Three mayor agricultural programs, in millions of 2005 US$



Source: ***Sexto Informe de Gobierno 2006*** **-President Fox**

Figure 4: Final household food consumption shares, Mexico, 1979 to 2004

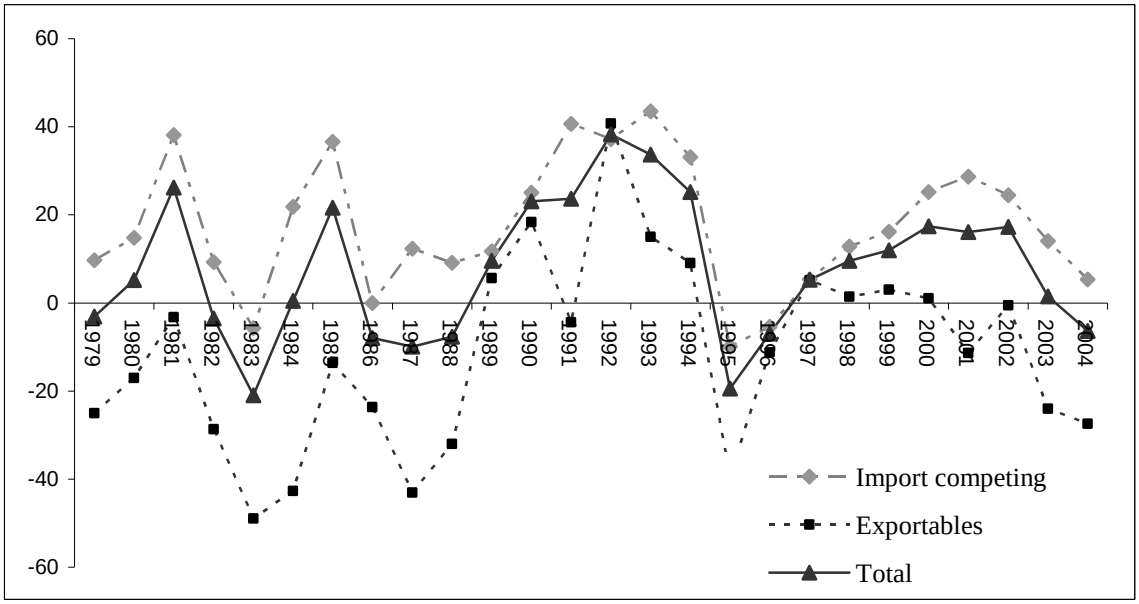
(proportion)



Source: Authors' spreadsheet

Figure 5: Nominal rates of assistance to exportable, import competing and all covered agricultural products, Mexico, 1979 to 2004

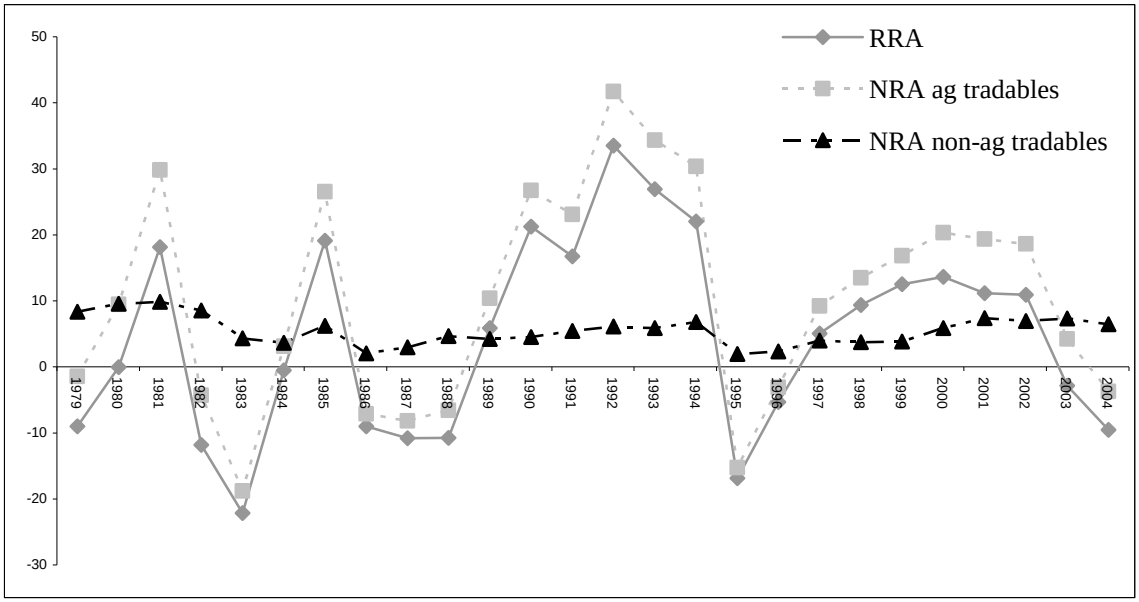
(percent)



Source: Authors' spreadsheet

Figure 6: Nominal rates of assistance to all non-agricultural tradables, all agricultural tradable industries, and relative rates of assistance[a], Mexico, 1979 to 2004

(percent)

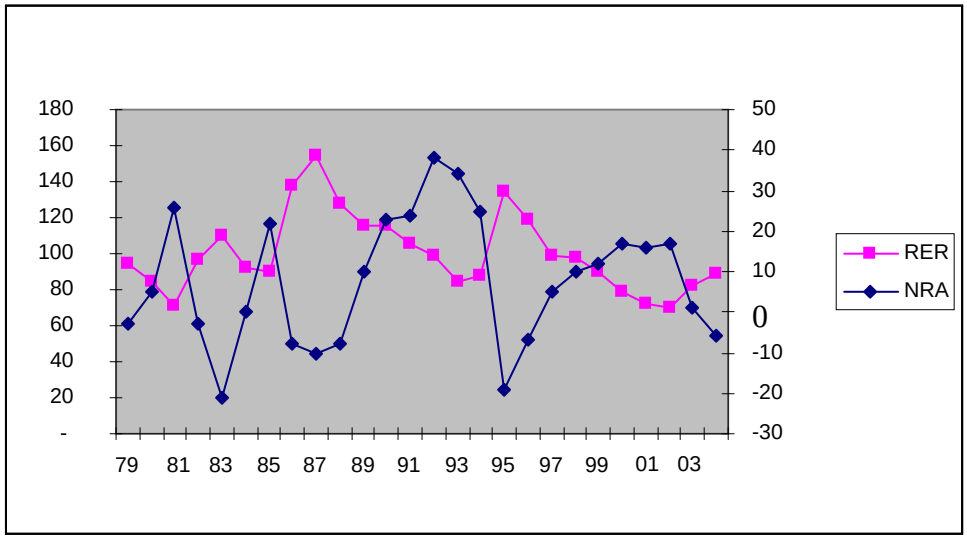


[a] The RRA is defined as 100*[(100+NRAag^t)/(100+NRAnonag^t)-1], where NRAag^t and NRAnonag^t are the percentage NRAs for the tradables parts of the agricultural and non-agricultural sectors, respectively.

Source: Authors' spreadsheet

Figure 7: Real exchange rate and nominal rates of assistance to all agricultural tradables,[a] Mexico, 1979 to 2004

(RER base 1979-2004=100, left axis; NRA in percent, right axis)



Source: Central Bank for RER and author's estimates of NRA

Appendix Table 1: Nominal rates of assistance to covered products, Mexico, 1979 to 2004 (percent)

	Barley	Bean	Beef	Coffee	Egg	Maize	Milk	Pig-meat	Poultry	Rice	Sor-ghum	Soy-bean	Su-gar	Tom-ato	Wh-eat	All
1979	-40	15	-17	-12	-10	-10	115	-13	188	-9	-25	-2	0	-55	-13	-3
1980	-9	15	-9	-7	24	14	144	-11	156	-16	8	25	-52	-52	-6	5
1981	18	-12	16	-84	32	58	220	-6	178	-17	4	44	-2	-20	17	26
1982	-48	2	-8	-93	-10	39	83	-33	158	-4	14	29	0	-43	-7	-3
1983	51	244	-50	-93	-16	1	59	-50	101	-30	-20	31	4	24	-3	-21
1984	71	1	-38	-95	-29	19	204	-18	82	31	12	104	22	2	42	0
1985	11	46	-2	7	-5	16	324	-9	108	89	11	73	21	-51	121	22
1986	7	-29	-15	-68	-21	18	165	-57	44	-33	6	30	21	-35	20	-8
1987	-42	-31	-33	-70	-1	64	105	-51	122	-22	18	60	-5	-55	18	-10
1988	-11	-21	-13	-84	10	4	40	4	99	-44	-13	10	-19	-35	29	-8
1989	-28	-53	26	-33	-15	16	93	10	108	-17	-14	20	-13	-53	4	10
1990	-21	-17	34	-6	-11	27	265	-6	161	-11	-13	7	18	-27	48	23
1991	50	4	32	-13	-11	42	129	1	136	9	4	73	85	-57	77	24
1992	47	-11	43	-26	2	30	116	16	81	15	0	30	88	39	47	38
1993	40	-10	48	-28	15	30	195	4	103	55	5	26	86	-31	64	34
1994	25	-20	30	-45	15	10	170	17	90	33	-16	-6	54	-41	72	25
1995	-40	-45	-20	-55	-15	-14	24	-23	10	4	-1	-15	-15	-72	0	-19
1996	-12	-21	13	-22	-11	-20	34	-22	10	8	-21	-10	33	-45	30	-7
1997	-13	7	31	-32	-6	-17	63	-10	28	-4	-19	-16	41	-32	17	5
1998	4	-2	24	-32	-22	-5	87	9	24	-1	-15	-4	56	-33	40	10
1999	-11	-4	10	1	-27	-7	95	23	16	12	-18	19	126	-11	38	12
2000	-4	12	12	-35	-21	9	85	-2	55	27	-6	-8	105	-18	60	17
2001	2	41	-1	-34	-13	11	96	4	42	60	-11	21	97	-41	86	16
2002	-8	-13	14	-28	-20	-6	107	23	72	69	-9	-6	69	-39	60	17
2003	-23	-15	-16	-27	-16	-11	79	5	42	17	-11	5	67	-47	51	1
2004	-1	-27	-23	-45	-9	-18	61	-13	27	14	-22	-25	70	-40	49	-6

Source: Authors' estimates

Appendix Table 2: Value shares of primary production of covered and non-covered products[a], Mexico, 1979 to 2004

(percent)

	Barley	Bean	Beef	Coffee	Egg	Maize	Milk	Pig-meat	Poultry	Rice	Sor-ghum	Soy-bean	Su-gar	To-mato	Wh-eat	Non covered
1979	1	3	23	1	4	11	6	14	2	1	4	2	3	7	4	17
1980	1	3	19	0	3	14	5	11	2	1	4	1	7	5	4	22
1981	1	5	15	3	3	13	4	11	1	1	5	1	4	4	4	26
1982	1	2	17	4	4	8	6	17	2	1	3	1	3	6	5	20
1983	0	1	22	4	4	13	5	16	2	1	4	1	3	3	3	20
1984	0	2	18	4	5	13	3	15	3	0	4	1	2	3	4	23
1985	1	2	17	1	5	16	3	13	3	1	5	1	3	6	3	22
1986	1	4	19	2	7	11	3	13	4	1	4	1	3	6	4	18
1987	1	3	20	3	5	8	3	12	3	1	4	1	4	10	3	19
1988	0	2	21	7	5	10	5	9	2	1	5	0	4	5	3	21
1989	1	3	20	1	6	10	4	7	3	1	4	2	5	6	5	24
1990	1	6	16	1	6	13	2	8	3	0	4	1	4	5	3	27
1991	0	4	16	1	5	11	4	8	3	0	3	1	2	11	3	28
1992	0	3	16	0	5	16	5	7	4	0	4	1	3	5	3	29
1993	0	5	14	0	5	16	3	6	3	0	2	1	3	10	3	29
1994	0	4	16	1	5	15	4	6	4	0	2	1	4	6	3	29
1995	1	4	16	1	5	16	5	6	5	0	3	0	5	9	3	20
1996	1	4	11	1	6	17	6	7	6	0	5	0	3	8	3	21
1997	1	3	12	1	6	15	5	8	6	0	4	0	4	7	3	25
1998	0	4	13	1	6	13	5	6	8	0	4	0	3	7	2	27
1999	0	3	15	1	7	13	5	5	8	0	3	0	2	7	2	28
2000	1	2	15	1	7	11	6	7	7	0	3	0	2	7	2	28
2001	1	2	16	0	7	11	5	7	8	0	3	0	3	6	2	28
2002	1	4	15	0	7	13	5	6	7	0	3	0	3	6	2	28
2003	1	3	18	0	7	12	5	6	7	0	3	0	3	6	2	26
2004	1	3	20	0	6	13	5	7	8	0	3	0	3	7	1	24

[a] Valued in US dollars at undistorted farmgate prices, with each row adding to 100 percent.

Source: Authors' estimates

Appendix Table 3: Nominal rates of assistance to covered, uncovered and all agricultural products, to exportable and import-competing agricultural industries[a], and relative to non-agricultural industries, Mexico, 1979 to 2004

(percent)

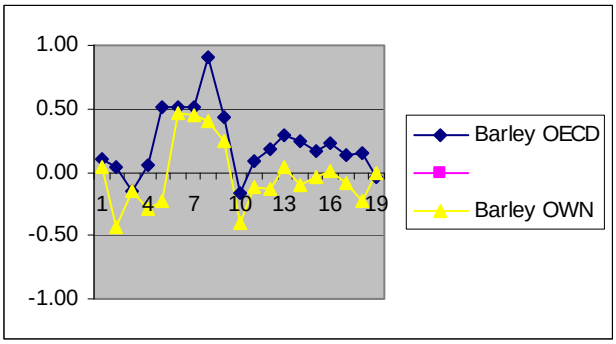
	Covered products	Non-covered products	Total ag NRA (incl NPS)[a]	Exportable NRA[a]	Import-competing NRA[a]	All ag tradables	All non-ag tradeables	RRA[b]
1979	-3	7	-1	-28	13	-1	8	-9
1980	5	24	9	-23	23	9	10	0
1981	26	39	30	-18	48	30	10	18
1982	-3	-8	-4	-38	13	-4	9	-12
1983	-21	-9	-19	-50	-3	-19	4	-22
1984	0	11	3	-47	26	3	4	-1
1985	22	43	26	-21	46	27	6	19
1986	-8	-3	-7	-29	3	-7	2	-9
1987	-10	-1	-8	-46	15	-8	3	-11
1988	-8	-2	-7	-38	13	-7	5	-11
1989	10	12	10	-6	19	10	4	6
1990	23	35	26	6	35	27	5	21
1991	24	20	23	-17	46	23	5	17
1992	38	48	41	38	43	42	6	34
1993	34	33	34	2	51	34	6	27
1994	25	21	30	-6	40	30	7	22
1995	-19	-15	-15	-45	-7	-15	2	-17
1996	-7	-3	-3	-18	-2	-3	2	-5
1997	5	7	9	-6	10	9	4	5
1998	10	11	13	-9	19	13	4	9
1999	12	16	17	-1	21	17	4	13
2000	17	15	20	-5	28	20	6	14
2001	16	9	19	-20	31	19	7	11
2002	17	4	18	-13	26	19	7	11
2003	1	-4	4	-30	16	4	7	-3
2004	-6	-10	-4	-31	6	-4	6	-10

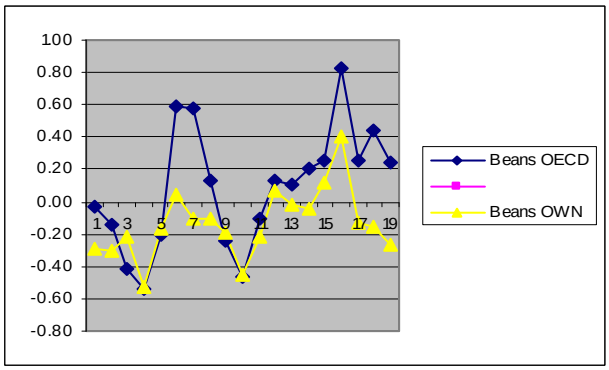
[a] NRAs including product-specific input subsidies, assistance to nontradables and non-covered products, and non-product-specific (NPS) assistance.

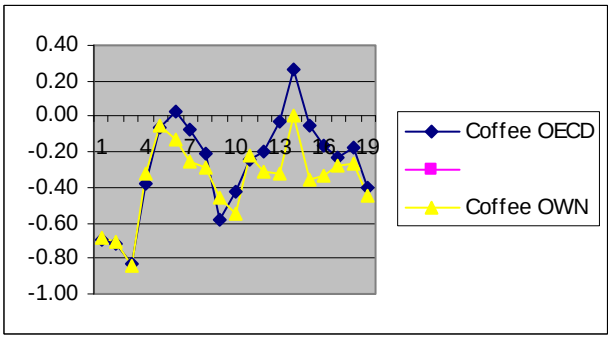
[b] The Relative Rate of Assistance (RRA) is defined as $100*[(100+NRAag^t)/(100+NRAnonag^t)-1]$, where $NRAag^t$ and $NRAnonag^t$ are the percentage NRAs for the tradables parts of the agricultural and non-agricultural sectors, respectively.

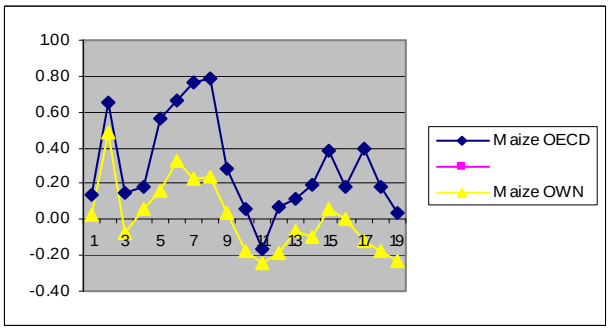
Source: Authors' estimates

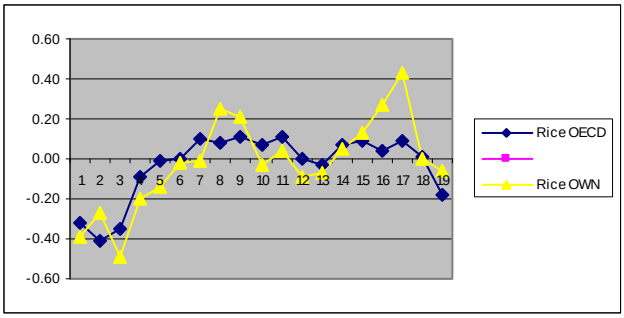
Appendix Figure 1: Nominal Rates of Assistance: A comparison with OECD estimates, 1986 to 2004







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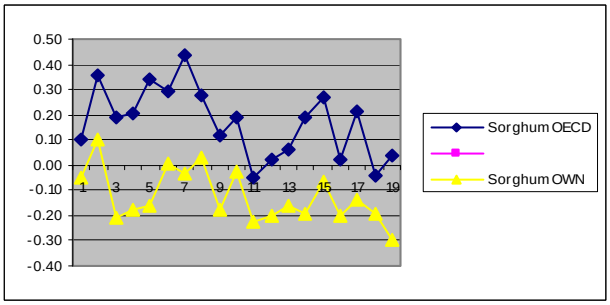
Rice OWN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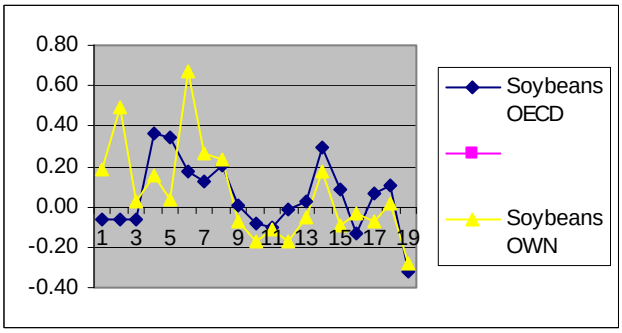
Sorghum OWN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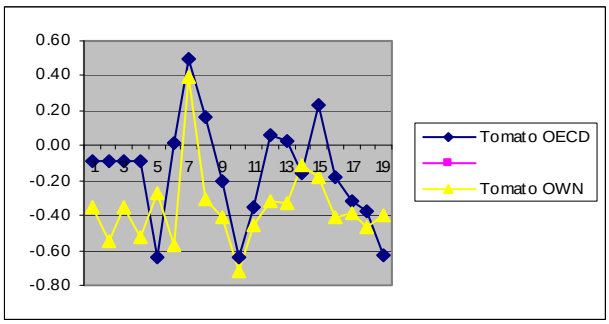
Soybeans OWN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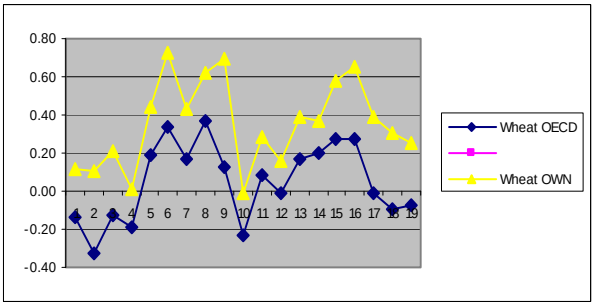
1 3 5 7 9 11 13 15 17 19
Tomato OECD
Tomato OWN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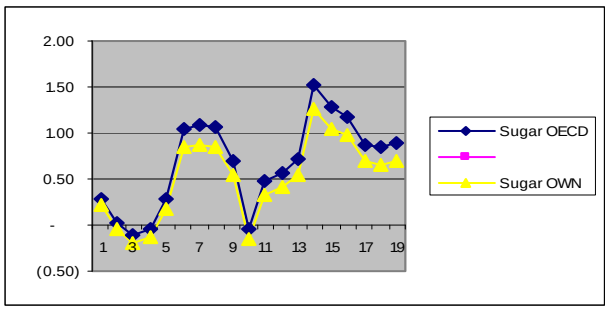
Wheat OECD
Wheat OWN



Source: Authors' calculations and OECD (2007)