

**From Prices to Incomes:  
Agricultural Subsidization without Protection?**

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**SUMMARY:** Drawing from the experience of the direct income support programs recently introduced in the European Union, Mexico, and the U.S., this paper highlights problems that may arise when the agricultural sector of a developing economy moves from price-based subsidization to less distorted income support. It concludes that, despite their theoretical appeal, such programs have many shortcomings; moreover developing countries may lack the necessary supporting arrangements needed to make such programs effective.

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## 1. Introduction

Pricing policies play a vital role in the performance of agriculture. But they have often been destructive of economic development (World Bank, 1986; Tyers and Anderson, 1992; Krueger et al., 1992; Meerman, 1997). In response, many countries have undertaken structural reforms that aim to revitalize production by liberalizing prices and integrating them with those of the world economy. Moreover, responding to commitments made under the recently completed Uruguay round of GATT as well as other multilateral and regional arrangements, more countries are expected to embark on similar price and trade reforms. For example, developing countries are committed to reducing average distorting price supports by 13% in 10 years (Valdés and McCalla, 1997). This paper focuses on the problems that may be encountered when a country moves from price-based subsidization to direct income support.

Contrary to the common belief that industrial countries protect agriculture while developing ones tax it, some developing countries protect, either the sector as a whole, or specific sub-sectors. In a study concerning eight Latin American countries, Valdés (1996) found that, on average Chile, Colombia, and the Dominican Republic protect agriculture while Brazil mildly protects it. Some countries (Argentina, Ecuador, Paraguay, and Uruguay) protect only certain subsectors (cotton in Paraguay, wheat in Uruguay, etc.). Over 1989-92, Nigeria protected wheat and coarse grains by maintaining prices at an average of 82% and 92% above the adjusted world market price. Algeria, Morocco, and Tunisia protected the same commodities at a combined average of 34% and 13%; Mexico's effective tariff equivalents for wheat and coarse grains were 55% and 69% above world prices in 1989-93 (Ingco, 1995). Extremely high production-supporting subsidies in the agricultural sectors of former centrally planned economies were the rule (Brooks, 1993).

Price subsidization of agricultural inputs, including fertilizer, irrigation, seeds, electricity, credit, and insurance has been common practice in developing countries. For example, Knudsen et al. (1990) report that in the early and mid-1980s, in Sri Lanka and Turkey fertilizer subsidies cost about 1% of the total GDP. Less, but still considerable fertilizer subsidies were present in Côte d'Ivoire, Egypt, Gambia, and Tanzania ranging between 50% to 100% of the market price of fertilizer.

Depending on whether agriculture has been subsidized or taxed, the reforms will lead to

different consequences for stakeholders and hence to resistance by different political forces. Removal of a commodity tax will be welcomed by producers but is likely to find resistance by the treasury or any other group that has benefited from the tax. Removal of a subsidy is likely to meet very strong resistance from producers if the expected reduction in receipts threatens the profitability, or even viability, of their production.<sup>1</sup>

To check such adamant political opposition, while also recognizing that removal of subsidies will substantially reduce producers' income, some governments have attempted to replace price-distorting subsidies by direct income-support mechanisms that make current production decisions independent of, or less dependent on, support prices. Ideally, they are allocatively non-distortionary. Moreover, because they compensate for the loss of income, they are politically feasible and make reform possible.<sup>2</sup>

In theory, replacing price support by a lump-sum transfer is a win-win outcome and thus an attractive policy option. Ideally, producers receive about the same income as before; the treasury is no worse off as it does not spend any more than it did before; and since resources are reallocated more productively, the economy as a whole should become better off.<sup>3</sup>

Analysis of three existing cases, however, raises some important questions. Drawing from the experience of the support programs introduced in the European Union (EU) in 1993, Mexico in 1994, and the U.S. in 1996, this paper highlights problems that may arise when the agricultural sector moves from price-based subsidization toward direct income-support compensation. In developing countries these problems may be severe. The income-support mechanism may be misplaced, or the entire reform process may be put in jeopardy.

## **2. The European Union, Mexican, and U.S. Programs**

On May 22, 1992, the EU member states agreed to reform a significant part of the Common Agricultural Policy (CAP, Commission of the EU, 1993).<sup>4</sup> In 1993, the EU reduced support prices of grains, oilseeds, and pulses and began to compensate producers by direct payments – based on their past acreage in these crops – in conjunction with measures limiting the area for current production (Table 1). Because of the reform, producer prices for these crops have declined by a third since 1993.

In 1994, Mexico's PROCAMPO (Programa Nacional de Modernización del Campo), a new farm support program, was introduced (World Bank, 1995; SARH) to provide income support to

grain and oilseed producers (corresponding to 90% of all Mexican farmers). It replaced a system of administered or so-called guarantee prices which had shifted production to those crops with the highest degree of relative protection, rather than with the highest profitability according to world prices. The poorest peasants did not benefit from guarantee prices as they hardly produced for market. In contrast, PROCAMPO does not support production of specific commodities, but farmers' income. Under PROCAMPO, prices of the nine crops in the program have become – in law at least – market driven or autonomous. Hence, production and trade should become less distorted. PROCAMPO also is distributionally more attractive than the earlier guarantee price-support because poor subsistence farmers are eligible for payments and there is a ceiling of 100 hectares on the amount of land that any single farmer can use to justify payments (Table 1).

On April 4, 1996, the Federal Agricultural Improvement and Reform (FAIR) Act became law, after the longest farm-bill debate in U.S. congressional history (USDA, 1996). FAIR removed the link between income support payments and farm prices by providing “production flexibility contract payments” for a number of crops. Participant producers receive these payments as a function of the amount of land registered for government support payments in earlier years. Hence, the payments are independent of current production decisions. The payments are fixed annually at a declining rate and under current legislation will end after seven years (Table 1). In the past, payments closed the gap between U.S. Department of Agriculture (USDA) target and market prices. Today, farmers have far greater flexibility to make planting decisions. Annual acreage idling required as part of the previous support programs has been eliminated and producers are now free to plant any crops on the former “contract acres”, except fruits and vegetables. Hence, producers depend more heavily on the market and also bear greater risk from increased price variability.<sup>5</sup>

### 3. Assessment of the Programs

All three programs are similar in their explicit goal of delinking income support from current production decisions and in moving toward market-driven prices. On efficiency grounds the three income support schemes are among the less distortionary agricultural income-redistribution

**Table 1: Characteristics of Agricultural Support Programs: Mexico, U.S., and EU**

Mexico: PROCAMPO	U.S.: FAIR	EU: CAP Reform
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<i>Objective</i>	compensate producers for elimination of guarantee prices on support crops	compensate producers for elimination of deficiency payments	compensate producers for reduction in support prices
<i>Implemented</i>	1994	1996	1993
<i>Payment basis</i>	average acreage in support crops during 1991-93	acreage that received deficiency payments in any of the past 5 years	average acreage in support crops during 1989-91
<i>Support products</i>	wheat, maize, sorghum, barley, rice, cotton, beans, soybeans, safflower	wheat, maize, sorghum, barley, rice, cotton, oats	wheat, maize, barley, rye, oats, rape seed, sunflower, soybeans, dried pulses, beans, tobacco, beef, and sheepmeat
<i>Time profile</i>	first 10 years fixed in real terms; declining in final 5 years; 15 years total	declining in real terms; program lapses after 7 years, unless extended	fixed in nominal terms; no expiration date
<i>Payment limits</i>	\$6,700 per farm	\$40,000 per farm	no upper limit
<i>Restrictions on the use of support-crops land</i>	land should be allocated to support-crops (this requirement was added after the introduction of the program; since 1996 the requirement became less restrictive since land can be allocated to other in agricultural uses)	land should be kept in agricultural uses but cannot be allocated to fruits and vegetables; must comply with existing conservation plans	land should be allocated to support-crops while large producers must set aside a predetermined level of support-crops land
<i>Other features</i>	“negotiated” prices in effect for the first 2 years of the program (transition period); floor prices for maize and beans are retained	non-recourse commodity loans are retained in modified form	support prices continue for cereals at lower level

**NOTES:** The upper limit for PROCAMPO payments was 100 hectares while the per hectare payment is currently N\$484, giving approximately US\$6,700 (at 7.2 N\$/US\$). Following the 1994 devaluation PROCAMPO payments were not fully adjusted to inflation.

**SOURCE:** World Bank (1995) and SARH for PROCAMPO; USDA (1996) for FAIR; and Commission of the European Communities (1993) for the CAP Reform.

mechanisms. All three programs promote allocative efficiency in that quantity produced and price received are – in varying degrees – made independent of the amount of support.

Since the amount of support in the new programs depends on land used for past agricultural production, large farmers will receive most of the support. In an industrial country this may be more-or-less an acceptable practice since farmers are perceived to have lower

standards of living than other citizens. This perception is clearly the case in a number of OECD countries where one of the most commonly declared objective of agricultural policy is “[a] satisfactory and equitable standard of living for farmers” (Winters, p. 241). However, in many developing countries (especially in South Asia and Latin America) this will normally be a less appropriate criterion, since land is not equally distributed: a few with relatively high income own most land, while most farmers own little or even no land whatsoever.

Such programs may also promote equity in developing countries where poverty and degree of subsistence production have strong positive correlation. Under such a program, poor, subsistence, but land-owning producers are better-off because they can auto-consume the previously subsidized commodities and receive cash payments at the same time (see Table 2). For example, Mexican farmers who own less than two hectares of land receive more than 8% of PROCAMPO payments, although they have historically marketed very little (Deininger and Heinegg, 1995). This contrasts favorably with the situation where subsidies apply only to the traded portion of the commodity.

On efficiency grounds, all three programs are less than ideal in the sense that the use of land is not entirely delinked from the program. CAP reform requires that the land remains in production of the crops eligible for support and also producers must set aside (i.e., hold out of production) a predetermined level of support-crops land; PROCAMPO is less restrictive in that it allows a wider variety of crops to be cultivated under the program; FAIR requires that land should be kept in agricultural uses but it cannot be used for fruits and vegetables while producers must also comply with existing conservation plans. These restrictions on land use reduce allocative efficiency. In developing countries they may also pose implementation problems since monitoring compliance on cultivation restrictions would be very complicated, especially in areas where the average farm size is small. Moreover, monitoring such restrictions may lead to corruption.

The fiscal costs of the programs can be problematic. Thus far, two of the programs have been more costly than the programs they replace – evaluated at prices prevailing at the time of their implementation. In the U.S. the cost of the program in 1996-97 will be about \$US 5.5 billion, as opposed to \$US 4.2 billion spent in 1994-95 for deficiency-payments (USDA, 1996). In Mexico the introduction of PROCAMPO almost doubled the transfers to the agricultural sector –

from N\$ 6.4 billion in 1993 to N\$ 11.7 billion in 1994 – (SARH).<sup>6</sup> Moreover, if the programs start out expensive, *ceteris paribus*, their fiscal cost will always remain high because they are independent of world price.

*Ex post*, however, the fiscal cost of the new program compared to what the fiscal cost would have been under the old price-support program, depends on actual world prices. Under high world prices, the transfers to farmers due to price-supports would be low or even cease. For example, in the U.S., because of the 1996 boom in grain prices, support based on deficiency payments would have been \$US 1 to 2 billion – a fraction of the \$US 5.5 billion under the FAIR act. Under low world prices, price subsidies would be higher, making the new program “a bargain.”

Increased farmer intra-season risk is another consequence of income support programs. Replacement of stable support or guarantee prices by direct income transfers exposes producers to the higher risk of more volatile prices. The shock from the exposure to risk would be more prevalent in countries where the government set panterritorial and panseasonal prices than in countries with protection, such as subsidies per output unit, floor prices, possibly non-tariff barriers, and import tariffs. Moreover, the risk factor is expected to be more consequential in developing countries where producers and traders do not have direct (or even indirect) access to hedging instruments such as forward and futures exchanges.

Ideally, price and trade reforms are Pareto-improvements that induce growth in the overall economy through better resource allocation. But, following the removal of protection, agricultural growth is likely to be reduced. Lower prices reduce investment and accelerate labor’s exit from agriculture. Hence, agricultural supply response is expected to be negative. There is some evidence that the reforms undertaken by the Mexican government in the late 1980s and early 1990s (including the implementation of PROCAMPO) on balance reduced the profitability of the crop sector (Baffes, 1997; World Bank, 1996).<sup>7</sup> Moreover, since contraction of the sector will inevitably cause reduction in the demand for farm labor, the income of landless farm workers may decline (at least in the short run), although they may benefit to the degree that the programs reduce the prices of food which they purchase.

It is important thus to be aware of these consequences early on as the failure of the reforms to induce supply response and increase demand for labor, at least in the short run, may

lend to confusion and resistance that could jeopardize the reform process.

#### **4. The Mexican Experience**

Mexico was not adequately prepared for implementing the new income support scheme. The program was announced first and the registration of eligible producers and the amount of land covered by the program followed with a substantial lag. This sequencing caused an important moral hazard as many farmers apparently reacted by increasing the amount of land in production of the eligible commodities so as to increase future program-payments. So, the immediate effects of announcing the income support scheme may have been the opposite of those desired. Rather than moving resources to more efficient uses, the scheme, temporarily at least, moved resources into production that was already excessive. Moreover, because land rights among land-owners, tenants, and share-croppers are unclear, it has often been difficult to determine who is entitled to the payment.<sup>8</sup>

Government credibility was also an issue. Initially, some producers were either unaware or did not believe that the government would implement the program. Instead, they feared taxation and consequently under-reported land allocated to eligible commodities.<sup>9</sup> Furthermore, the fact that initially PROCAMPO was to delink payments from current use of land but later required that land continue to be allocated to the eligible crops, may have further discredited the government. Following 1996, however, the government has increased the number of eligible crops while farmers have always been free to vary the production mix of eligible crops.

In Mexico, the macro-economic environment also played an important role. Before the 1994 devaluation, most grains in Mexico were highly protected through import controls. After the devaluation, while crop prices continued at close to the same levels as before in domestic currency terms, there was far less protection when compared to world prices; for some crops, domestic prices were even higher than world ones. Although prices of tradable inputs also increased, to a large degree one may argue the devaluation substituted for PROCAMPO.

A sound macro-economic environment can also support the transition in making possible a liberal trade regime that enables producers and traders to hedge in forward and futures markets to alleviate short term risk arising from price variability. The hedge can be achieved through exchange rate or interest rate contracts in existing futures exchanges.<sup>10</sup>

Performance of markets is another issue. Mexico's guarantee prices, i.e., panterritorial

and panseasonal target prices supported by public purchase, storage, and transport of the commodities plus quantitative import restrictions, effectively displaced the notion of the autonomous market. The less regulated markets that are replacing the earlier system may still be rather underdeveloped and inefficient. In Mexico moving from guarantee prices to a market economy is more complicated than in countries with a strong tradition of competitive commodity markets.

## **5. Towards a Successful Transition**

Even though the three programs are a move in the right direction, as indicated in the Box, they could have been more effective in several ways.

### **A – Shortcomings of existing income support programs**

- Restrictions on the use of land
- Fiscal costs
- No explicit end to support
- Incomplete coverage

### **B – Developing-country institutions which may not be supportive**

- National land registration
- Land-tenure rules
- Government credibility
- Macroeconomic environment
- Commodity markets

*Restrictions on Land-Use.* With the exception of environmental considerations and provisions to set land aside, the main justification for restrictions on land-use is to ensure that program payments go only to bona fide farmers – as it is difficult to bring support to non-producers. Nevertheless, one important social benefit for replacing price-based subsidization by an income support program is to encourage resources to be used as relative prices and comparative advantage dictate. Were land fully freed, the resulting improvement in resource allocation would probably offset the increase in fiscal burden, if any, and make the change a clear Pareto-improvement.

Credit with its associated positive impact on investment is another reason for not imposing any restrictions on the use of land. Future payments under the income support scheme

could be used as credit collateral or sold outright as an asset. However, since it is unlikely that the lending institutions would have the capacity (and authority) to enforce the restrictions on the use of land, expected program-payments cannot be used as collateral. Finally, enforcement of restrictions on land-use entails careful, and in some countries relatively expensive, administrative measures. In Mexico, for example, the majority of extension workers are in effect working for PROCAMPO by spending their time monitoring the enforcement of restrictions on land-use.

*Fiscal Costs.* It is clear that fiscal costs of the programs should not exceed the costs of the programs they replace. Furthermore, if world prices are high (as were, for example, grain prices in 1996), producers not only receive these high prices, but they are also financed by the program thus resulting in excess burden to taxpayers – who, as consumers pay high prices and as taxpayer's are burdened with the program's costs. To circumvent the undesirable double-taxation and hence make the program equitable from a producer-consumer-taxpayer perspective, rather than being fixed, payments should be linked to world prices so that during periods of high world prices producers receive offsetting lower income-support and vice-versa. In addition, rather than having uniform level of per hectare support, a declining index may be applied. For example, the first 10 hectares receive full support, say \$100/hectare, the next 10 hectares receive less support, say \$50/hectare, and so on, effectively increasing the relative support to small producers and hence enhancing the poverty effect of the program.<sup>11</sup>

Obviously, limits in terms of maximum acreage eligible for income support are an equitable devise for containing fiscal costs. Equally obviously, the limits will reduce support to larger producers. As can be seen in Table 2, above-average-yield large producers are definitely relative losers due to the transition. Some of these producers are also likely to be powerful and may seek “compensation” by demanding high eligibility limits.

*Time Profile.* To what extent the programs are transitional mechanisms is clearly a political question. While PROCAMPO states that it will be phased out in 15 years and that world prices will then prevail in the sector, FAIR's language leaves the question of support after the seven-year period wide open. Thus far, the CAP is not subject to a time profile. Nevertheless, it is important to be clear that the final objective is to eliminate special supports to farmers and thus the programs should “wind down” to an explicit expiration date. It should be emphasized here, however, that the existence of an explicit time profile no longer renders such programs as Pareto

improvement, for the simple reason that producers who previously were receiving support, no longer do and hence they are worse off.

*Comprehensiveness.* The three programs discussed here are far from comprehensive. The FAIR does not apply to sugar, tobacco, peanuts, and milk, all of which are heavily protected in ways that seriously misallocate resources. PROCAMPO is restricted to 9 commodities while it leaves price floors for two commodities (maize and beans). CAP’s reform, although it covers a wide variety of crops, including some livestock, leaves price supports in place.

**Table 2: Relative Gain/Loss Matrix from New Programs by Producer Groups**

	Below average yield	Above average yield
<i>Small (subsistence) producers</i>	Gain	Gain
<i>Producers below eligibility limit</i>	Gain	?
<i>Producers above eligibility limit</i>	?	Loss

**NOTES:** Assuming direct income-support programs with costs equal to preceding price-support programs, “Gain” implies that the producer receives more income under the direct income support while “Loss” implies the reverse; “?” means that the outcome is undetermined. In Mexico the eligibility limit is the amount corresponding to 100 hectares while in the U.S. it is \$40,000. There is no EU eligibility limit.

*Institutional Issues.* The above shortcomings apply in both developed and developing countries. However, weak supporting institutions are more likely to be a problem in developing countries (see Box). For example, to ensure fairly and timely producer payments, a national land registry should exist before the announcement of the program. Furthermore, government must have policy credibility, if producers are to react as desired. The macro-economic environment, above all the exchange rate should be adequate and stable. In some cases eliminating currency overvaluation may make it possible to also eliminate protection without fiscal compensation. If substantial devaluation is likely, a better approach to eliminating price supports may be to make explicit the benefits to farmers that may result from devaluation and include elimination of agricultural price-supports as part of the macroeconomic reform package. Finally, efficient and integrated commodity markets are needed to ensure a smooth transition.

“Who receives the payment” may also be an issue, particularly in developing countries where land tenure rights are very much in flux. Consider a case where the land has been operated by a tenant for the entire period on which the payments are based. If support is based on land previously allocated to supported crops, the land owner will claim the payments. On equally

valid grounds, the tenant may claim the payments since if it was not for his cultivation, the land would not have been eligible for support. Resolving the “who-receives-the-payment” issue will often complicate the implementation process.

Thus, in the absence of land-tenure rights, direct income support may not be the appropriate route to reform. Moreover, appropriate preparation of a transition program may require an extensive survey of the rural economy in order to identify the distribution of owner/non-owner operated farms. The survey will indicate not only the technical feasibility of the program, but may also give useful information on other aspects such as identification of the distribution of farm size, yields, and commodities produced. Such information may be necessary to design equitable and affordable programs, that are politically acceptable.

## **6. Concluding Remarks**

In designing income-support programs it is well to keep in mind that delinking support from current production decisions implies consequences which, even though fully expected, are likely to be perceived as “negative”. Producers will undoubtedly face higher risk from increased price variability. As the ratio of output to input prices will be lower, negative supply response in agriculture should be expected for the crops in question which in turn may reduce demand for agricultural labor. Finally, as is the case with other types of support, many large producers who will receive the lion’s share of the support may not be in the desired target group; that is, those most in need of support during the transition period. The latter problem has been well recognized and is one of the complicating factors behind attempts to further reforming the CAP.

It is unlikely that the conditions and requirements discussed earlier will be fully met, particularly in the developing countries that protect agriculture. Decision-makers need to be aware of these requirements to ensure design of feasible programs, quite apart from the question of dealing successfully with the political forces that are involved.

In conclusion, it is important to recall what a direct income support mechanism does and does not do. Despite increasing the income of subsistence land-holders, *it is not supposed to be a poverty reduction program*. As there is no provision on where and how the money will be spent *it is not supposed to be an investment program*, either. Moreover, because of its association with lower producer prices, *it is not expected to induce sectoral growth*. Instead, *it is a transitional income-redistribution mechanism, which could eventually transform agriculture into a fully*

*liberalized sector that helps resources to be allocated in a more efficient manner. Furthermore, because it is linked to an asset – land – the lion's share of the payments will inevitably go to large farmers, subject to an upper limit (if it is in place).*

## Endnotes

<sup>1</sup> See Winters (1987, 1989) and Gardner (1987, 1990) for a discussion of the political economy of agricultural protection.

<sup>2</sup> A clarification concerning the concepts of equity and efficiency may be helpful. Whether an income redistribution mechanism should be in place or not (be it price support, lump-sum transfer, etc.) is an equity question in the sense that to justify it, the benefiting group in the society is valued more than the losing group – the specific groups referred to in this paper are producers versus taxpayers and small versus large land-owners. In welfare economics, the income redistribution entails the assumption that the “policy maker” places a higher weight, say on producers (see Baffes (1993) for an exposition of weighted utilitarian functions). The efficiency argument, on the other hand, is centered around the following question: given that it is desirable to redistribute income, what is the most efficient way of doing so? Although this paper deals mainly with efficiency, when reference to equity is made, it is explicitly stated so.

<sup>3</sup> Gardner (1990, p. 190) puts it as follows: “The existence of deadweight losses from commodity market intervention implies that losers should be able to compensate the gainers a bribe that exceeds their surplus gains, while the losers are better off paying the bribe than enduring the intervention. The maximum size of the net gain is the deadweight-loss triangle. The reasoning, based on the compensation principles mentioned earlier, suggests lump-sum transfers as a policy reform that provides a Pareto improvement.” In contrast to the argument underlying this paper, proponents of price-support programs frequently justify them in terms of their alleged promotion of “agricultural efficiency and competitiveness” (Winters, 1990, p. 241).

<sup>4</sup> By 1991, the EU allocated nearly one percent of its GDP (58 billion ECUs) to agriculture, most of it to support the CAP. Price distortions were extreme. For example, U.K. wholesale prices for sugar, rice, and butter were 308%, 171%, and 247% of their respective world market prices at the wholesale level (Atkins, 1993, pp. 85, 87). In addition to being expensive, “[t]he vast bulk of CAP money goes to farmers, many of whom are well off.” (*Financial Times*; Friday January 24, 1997).

<sup>5</sup> New Zealand undertook substantial reforms in the agricultural sector over the last 8 years and removed most subsidies without implementing an interim scheme (Chamberlin, 1996). Japan, under the Uruguay Round Agreement, accepted a minimum access (4%-8% of domestic consumption) to foreign rice. Since such opening-up of the rice market is expected to lead to a lower domestic price of rice (and therefore to the decline in farmers’ income), the government enacted a new law, in the same Diet session as the ratification of Uruguay Round, which appropriate more than 6 trillion yen (about \$U.S. 60 billion) to take compensatory measures to increase farmers’ income. While the money is not for a direct cash payment to the farmers, it is intended to increase farmers’ income indirectly through various measures including improvement of infrastructure in the rural areas, enhancement of agricultural technology, credit, etc. (Goto, 1997).

<sup>6</sup> Consider the following excerpt from SARH (p. 30, translated from Spanish) regarding the costs of PROCAMPO: “The Executive Power will submit to the Chamber of Deputies a budget of N\$ 11.7 billion for PROCAMPO for calendar year 1994. It represents additional resources of N\$ 5.3 billion compared to the transfers already allocated during 1993 to CONASUPO and ASERCA, an increase of 83 percent. This increase is an important effort in that each urban citizen will make an income transfer to the rural sector of 1.45 percent, compared to that of 0.79 percent previously.”

<sup>7</sup> On a similar topic, Jenkins (1995) examined the relationship between trade liberalization and productivity growth for Bolivian manufacturing and concluded that (p. 593): “[T]he impact of trade liberalization on output has been negative for many sectors. Industries such as spinning and weaving, clothing and footwear, which face substantial import competition, have contracted since the mid-eighties.”

<sup>8</sup> Land tenure is one of the most difficult aspects of the Mexican farm policy. In addition to private farms, there is a class of quasi-communal farms, the *ejidos*. Created under the Constitution of 1917, *ejidos* guaranteed all Mexicans land rights through expropriations of large landholdings. The *ejido* holders rights over land and water use were subject to a number of restrictions. Sale or rental of *ejido* land was prohibited; *ejidatarios* could not hire wage

workers and they could not be absent from their farm for more than two years without losing their rights. The *ejido* system gave farmers little control in their choice of inputs and outputs (Heath, 1990). In 1992 a reform in the Mexican Constitution gave *ejidatarios* the right to rent and sell land to outsiders with the approval of a majority of *ejido* members. Land can now be pledged as a collateral. However, the titling process has been slow. de Janvry et al. (1995) report that by early 1995, only 20 percent of *ejidos* had been given land titles.

<sup>9</sup> Salinger et al. (1995) write regarding government's credibility and farmers' behavior in Mexico: "In actual practice, however, due to the fact that many areas were first under-reported (due to fear of Government taxation), then over-reported compared with known aggregate areas from agricultural censuses, the final determination of eligible areas has not yet occurred. In many instances, eligible areas are 'negotiated' at the community level, and thus only bear loose resemblance to the objective three-year record."

<sup>10</sup> In the case of cotton, Mexico guarantees a minimum price to farmers for a predetermined fee through the government organization of ASERCA. The minimum price is set using the New York cotton futures exchange. For a fee, ASERCA offers a guaranteed price in US dollars and hedges the risk by using fees to purchase put options on the exchange for future delivery after the harvest. Should prices fall, ASERCA pays the farmer the difference between the prevailing New York futures and guarantee price. If price rise instead, ASERCA makes no payment (Varangis and Larson, 1996).

<sup>11</sup> If the program is announced before the registries are completed, such declining index may not be as effective since farmers will have an incentive to divide the land among family members and hence fall in the lower bracket. Corporate farms can act similarly by including more members. Similar problems may arise with the upper limit.

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