From Prices to Incomes: Agricultural Subsidization without Protection?

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Drawing from the experience of the direct income support programs recently introduced in the European Union, Mexico, and the United States, this article highlights problems that may arise when the agricultural sector of a developing economy moves from price-based subsidization to less distorted income support. Such programs are a step in the right direction, but as currently implemented, they have many shortcomings. Moreover, developing countries may lack the necessary supporting arrangements needed to make such programs effective. The article argues that the programs should not restrict the use of land, that the programs should last for a stipulated period of time, and that the fiscal costs should be contained by linking income support payments to world prices.

Interventions in pricing policies play a vital role in the performance of agriculture, but they have often had an unfavorable effect on economic development (World Bank 1986; Tyers and Anderson 1992; Krueger, Schiff, and Valdés 1992; Meerman 1997). In industrial countries the allocative inefficiency resulting from the pricing policies of agricultural protectionism puts the deadweight losses to a protectionist government somewhere between 0.5 percent and 3 percent of gross domestic product (GDP) (Burniaux and others 1990). Fiscal costs have also been high and are increasingly viewed as excessive by predominantly urban electorates.

In response, many countries have undertaken structural reforms to stimulate production by liberalizing farm prices and integrating them with those of the world economy. Moreover, responding to commitments under the Uruguay Round of the General Agreement on Tariffs and Trade (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 price supports by 13 percent in 10 years (Valdés and McCalla 1997).

The move to eliminate distortions, a step that inevitably implies some redistribution of income, is bound to be resisted by those groups that are penalized. Producers, for instance, will welcome the removal of a commodity tax, but the treasury and
other groups that have benefited from the tax are likely to oppose it. Farmers will object to proposals to reduce producer subsidies, because the additional costs that result will threaten the profitability of agricultural production. (Winters 1987, 1989–90, and Gardner 1987, 1990, discuss the political economy of agricultural protection.)

To check such adamant political opposition, some governments have attempted to replace price-distorting subsidies with direct income support mechanisms so that current production decisions are independent of—or less dependent on—support prices for specific crops. Because income support programs compensate farmers for the loss of income, they are politically feasible and may make reform easier to accept.

Whether such schemes are in fact effective mechanisms for eliminating price supports is of interest to developing countries for at least two reasons. First, contrary to the widespread belief that industrial countries subsidize agriculture while developing ones tax it, today many developing countries subsidize agriculture—or its specific subsectors. Second, price supports in industrial countries affect developing countries in several ways. Subsidy-induced surpluses in member countries of the Organisation for Economic Co-operation and Development (OECD) depress world prices and reduce the income derived from competing exports from developing nations. The direct losses to foreign producers resulting from U.S. farm programs, for example, are estimated at about $1 billion in 1990. This figure is much higher if one considers the deadweight losses. OECD countries protect agriculture to insulate their markets from external shocks, but such subsidies depress world prices and increase their volatility, thus increasing the pressure for commodity stabilization programs in developing countries. Estimates suggest that the operation of the European Union’s Common Agricultural Policy (CAP) has doubled the variability of world dairy prices while raising prices of wheat and beef by almost 50 percent within the Common Market (Knudsen and others 1990).

Agricultural Protection in Developing Countries

Agricultural protection in developing countries is not uncommon. In a study of eight Latin American countries, Valdés (1996) found that Chile, Colombia, and the Dominican Republic protect agriculture, while Brazil offers minimal protection. Argentina, Ecuador, Paraguay, and Uruguay protect certain subsectors. From 1989 to 1992 Nigeria maintained official prices on wheat and coarse grains at an average of 82 percent and 92 percent, respectively, above their world market prices. Algeria, Morocco, and Tunisia protected the same commodities at a combined average of 34 percent and 13 percent. Mexico’s effective tariff equivalents for wheat and coarse grains were 55 percent and 69 percent of world prices in 1989–93 (Ingco 1995).
Extremely high production-supporting subsidies in the agricultural sectors of former centrally planned economies were (and in several cases still are) the rule (Brooks 1993). With the exception of some countries of the former Soviet Union, developing countries that have protected agriculture have usually been importers of the crops protected. In these countries protection has generally taken the form of import restrictions, including tariffs, import prohibitions, or restrictive import licensing. Because the transfer was made directly from consumers to producers, protection in these agricultural importing countries did not require large budget outlays. (The standard analysis of the efficiency, distributive, and fiscal effects of an import tariff is provided in appendix A.)

But in the OECD countries, agricultural protection has usually taken the form of crop prices pegged above world-market levels. This form of protection requires substantial fiscal outlays to finance the subsidies needed to encourage exports of the crop surpluses induced by the high prices. By 1991 the European Union was allocating nearly 1 percent of its GDP (58 billion ECUs) to agriculture, most of it to support the extreme price distortions under the CAP. For example, the wholesale prices of sugar, rice, and butter in 1991 were 308 percent, 171 percent, and 247 percent of respective world market prices (Atkin 1993).

Inputs have been subsidized as well. Governments have held down prices of fertilizer, irrigation, seeds, electricity, credit, and insurance. Knudsen and others (1990) report that in the early and mid-1980s, fertilizer subsidies in Sri Lanka and Turkey cost about 1 percent of total GDP, while those in Côte d’Ivoire, Egypt, Gambia, and Tanzania ranged from 50 percent to 100 percent of the market price of fertilizer.

Who Benefits from Agricultural Protection?

Replacing price supports with direct income support to farmers not only affects the income distribution of the concerned groups (the equity effect), but also generates efficiency gains (the efficiency effect). Whether income should be redistributed (through price supports, tariffs, taxes, lump-sum transfers, and so on) is an equity question in the sense that the marginal welfare of the proposed benefiting group (producers) is in some sense valued more than that of the proposed losing group (consumers or taxpayers). In terms of the demand-supply diagram shown in the appendix (figure A.1), the introduction of a protective tariff on imported agricultural commodities implies that certain producers are valued more than consumers. The efficiency argument, on the other hand, centers on the question of eliminating deadweight losses, that is, increasing total welfare by reallocating capital and labor away from the protected sector (agriculture) to more productive uses. In the real world the question of eliminating agricultural protection must simultaneously address both equity and efficiency.
In theory, such programs can be Pareto-optimal while maximizing GDP. A Pareto optimal policy change is one in which no one is worse off as a result of the change. In the present context achieving such an outcome essentially requires tradeoffs. Those benefiting from the reduction in prices of agricultural commodities due to policy changes give up enough of their increased income to farmers to fully compensate the latter for the loss of income resulting from the policy change. Therefore, replacing price supports with a lump-sum income transfer to farmers can be an attractive policy option. Ideally, producers receive about the same income as before; the treasury is no worse off because it does not spend any more than it did before; and the economy as a whole is better off because resources are allocated more productively. As Gardner (1990:190) puts it: “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.” The appendix provides a geometric version of this statement.

As a practical matter, whatever the aggregate net impact of the change from price to income support, these programs will also redistribute income within the farm community. Table 1 illustrates this point. The table is based on the Mexican proposal of 1994. In that year, Mexico's price supports on maize averaged about $59 a ton. Average annual national yields per hectare ranged from 1.60 tons (1989) to 2.35 tons (1992). The benefits to farmers were directly related to yields and the amount of land in maize (see the top panel of table 1). The second panel shows the benefits that would have resulted from the proposed plan to provide income support payments of $113 a hectare, up to a ceiling of 100 hectares. The “indifference” yield (that is, the point at which producers would be indifferent between price or income support) was 1.90 tons a hectare, which was also the median yield for 1989–92. The payment at the indifference yield was designed to compensate exactly the loss from eliminating price support. The big losers under the proposal would be high-yield farmers cultivating more than 100 hectares. Subsistence farmers would be the (relative) big winners. To the degree that they consumed the maize they produced, they received no payments under the price support regime. Table 1 shows this effect by assuming that the first hectare of production is not sold but consumed.

Reforming Agricultural Support

The European Union, Mexico, and the United States have all taken recent steps to reform their agricultural price subsidies. How have these policy changes affected equity and efficiency, and what lessons do these reforms have for developing countries?
Table 1. Hypothetical Transfers to Producers under Price and Income Support (dollars)

<table>
<thead>
<tr>
<th>Hectares</th>
<th>1.60 tons/hectare</th>
<th>1.90 tons/hectare</th>
<th>2.35 tons/hectare</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Assuming price support of $59/ton with a yield of 1.60 tons/hectare</td>
<td>Assuming income support of $113/ton with a yield of 1.90 tons/hectare</td>
<td>Gain or loss as a result of an income support program</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>113</td>
</tr>
<tr>
<td>50</td>
<td>4,758</td>
<td>5,650</td>
<td>5,650</td>
</tr>
<tr>
<td>100</td>
<td>9,516</td>
<td>11,300</td>
<td>11,300</td>
</tr>
<tr>
<td>115</td>
<td>10,943</td>
<td>12,995</td>
<td>11,300</td>
</tr>
<tr>
<td>200</td>
<td>19,032</td>
<td>22,600</td>
<td>11,300</td>
</tr>
<tr>
<td></td>
<td>113</td>
<td>113</td>
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<tr>
<td>115</td>
<td>11,300</td>
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<tr>
<td>200</td>
<td>11,300</td>
<td>11,300</td>
<td>11,300</td>
</tr>
</tbody>
</table>

Per hectare gain or loss as a result of an income support program

| 1        | 113                | 113                | 113                |
| 50       | 892                | 0                  | -1,338             |
| 100      | 1,784              | 0                  | -2,676             |
| 115      | 357                | -1,695             | -4,773             |
| 200      | -7,732             | -11,300            | -16,653            |

Note: It is assumed that production from the first hectare is consumed by the households. The data resemble the program in Mexico for maize; 100 hectares is the limit of the payment; $59/ton reflects the 1989 price support of maize; $113 was the originally projected per hectare PROCAMPO (Programa Nacional de Modernización del Campo) payment (before the 1994 devaluation); 1.60, 1.90, and 2.35 tons/hectare were the average national maize yields for 1989, the median of 1989–92, and 1991, respectively. At a yield of 1.90 tons a hectare, producers are indifferent between price and direct-income support. This can be seen in the lower panel where producers up to 100 hectares register neither gains nor losses.

Source: Authors’ calculations; see text.

European Union: The 1992 CAP Reform

The costs to the European Union (EU) of the Common Agricultural Policy are of three kinds: Consumers pay far more for food than they need to; the deadweight losses are high—perhaps as much as 3 percent of the EU’s gross domestic product; and budget outlays are high. In recent years the Common Agricultural Policy cost the EU nearly 1 percent of member GDP. These budget costs have become politically...
Table 2. Characteristics of Agricultural Support Programs in the European Union, Mexico, and the United States

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<thead>
<tr>
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<th></th>
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</thead>
<tbody>
<tr>
<td>Objective</td>
<td>To compensate producers for a reduction in support prices</td>
<td>To compensate producers for the elimination of guarantee prices on support crops</td>
<td>To compensate producers for the elimination of deficiency payments</td>
</tr>
<tr>
<td>Payment basis</td>
<td>Average acreage in support crops during 1989–91</td>
<td>Average acreage in support crops during 1991–93</td>
<td>Acreage for which deficiency payments were received in any of the past 5 years</td>
</tr>
<tr>
<td>Supported products</td>
<td>Wheat, maize, barley, rye, oats, rapeseed, sunflower, soybeans, dried pulses, beans, tobacco, beef, lamb</td>
<td>Wheat, maize, sorghum, barley, rice, cotton, beans, soybeans, safflower</td>
<td>Wheat, maize, sorghum, barley, rice, cotton, oats</td>
</tr>
<tr>
<td>Time profile</td>
<td>Fixed in nominal terms; no expiration date</td>
<td>Total of 15 years: first 10 years fixed in real terms; declining in final 5 years</td>
<td>Program lapses after 7 years unless extended</td>
</tr>
<tr>
<td>Payment limits</td>
<td>None</td>
<td>$6,700 per farm</td>
<td>$40,000 per farm</td>
</tr>
<tr>
<td>Restrictions on the use of support-crop land</td>
<td>Land should be allocated to support crops; large producers must put into fallow a predetermined level of support-crop land</td>
<td>Land should be allocated to support crops but since 1996 land can be allocated to other agricultural uses</td>
<td>Land should be kept in agricultural uses (excluding fruits and vegetables); use must be in compliance with existing conservation plans</td>
</tr>
<tr>
<td>Other features</td>
<td>Support prices continue for cereals at lower level</td>
<td>&quot;Negotiated&quot; prices in effect for the first 2 transition years of the program; floor prices are retained for maize and beans</td>
<td>Nonrecourse government guaranteed commodity loans are retained in modified form</td>
</tr>
</tbody>
</table>

Note: The upper limit for PROCAMPO payments is 100 hectares and the per hectare payment is currently 484 Mexican pesos, or approximately US$6,700 (at 7.2 pesos/US$). Following the 1994 devaluation, PROCAMPO payments were not fully adjusted to inflation.

Source: Commission of the European Communities (1995); USDA (1996); SARH (no date).
intolerable and have been by far the strongest impetus for reform. In 1993 the EU reduced support prices on grains, oilseeds, and pulses and began to compensate producers by direct payments—based on past acreage in these crops—in conjunction with measures limiting the acreage for current production (table 2). Since that time, producer prices for these crops have declined by one-third.

**Mexico: The 1994 PROCAMPO Program**

Traditionally, CONASUPO (Compania Nacional de Subsistencias Populares), Mexico's agricultural parastatal, has been heavily involved in marketing, transporting, storing, and processing most of the country's agricultural commodities. Maize, beans, and wheat, by far the most important agricultural commodities, have been heavily subsidized through a system of guaranteed producer prices. The government also set pan-territorial and pan-seasonal prices, which were usually announced before planting decisions were made. CONASUPO bought unlimited quantities at the guaranteed prices. Because producers knew in advance the price they were going to receive, they could shift production to those crops with the highest degree of relative protection rather than to crops that were the most profitable on the world market. The poorest peasants did not benefit from guaranteed prices because they hardly produced for the market.

In 1994 Mexico introduced a new farm program, PROCAMPO (Programa Nacional de Modernizacion del Campo), to provide income support to grain and oilseed producers—about 90 percent of all Mexican farmers (World Bank 1995; SARH no date). Under this regime prices of the nine crops in the program have become—in law at least—market-driven or autonomous. Thus production and trade should become less distorted. Moreover, PROCAMPO is distributionally more attractive than the earlier guaranteed 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 claim to justify payments (see table 2, box 1).

**The United States: The 1996 FAIR Act**

Before 1996 the U.S. government compensated farmers who participated in wheat, feed grains, rice, and cotton programs through a system of so-called deficiency payments. The payment rate was based on the difference between the target price (set by the government) and the higher of the market price or the price at which the government would value crops used as collateral for loans made by the Commodity Credit Corporation, a public entity. The total payment was equal to the payment rate, multiplied by a farm's eligible payment acreage (usually the amount of land devoted to cultivation of the crop in question) and the program yield (which was established
Box 1. A Closer Look at Mexico’s Program

Mexico was not adequately prepared to implement its new income support scheme. Several policy implications can be derived from its experience.

First, the program was announced well in advance of the registration date for eligible producers. The lag allowed many farmers to increase the amount of land used for production of the eligible commodities and thus to increase their future payments. So rather than moving resources to more efficient uses, the scheme was manipulated, initially at least, to move resources into production that was already inefficient. Moreover, because land rights among landowners, tenants, and sharecroppers were unclear, it has been difficult to determine who was entitled to the payment.

Government credibility was also an issue. Initially, some producers did not believe that the government would actually implement the program. Fearing increased taxation, they underreported the amount of land allocated to eligible commodities. Furthermore, the fact that PROCAMPO initially delinked payments from the current use of land but later required that the land continue to be allocated to the eligible crops may have further discredited the government. (In 1996 the government increased the number of eligible crops.)

The macroeconomic environment also played an important role. Before the 1994 devaluation, most grains were highly protected through import restrictions. The devaluation sharply reduced protection relative to world prices. Although prices of tradable inputs also increased, it can be argued that to a large extent the devaluation substituted for PROCAMPO.

Market performance is also relevant. Mexico’s old system of guaranteed prices effectively precluded any kind of autonomous market. Thus markets are still underdeveloped and inefficient. Moving from guaranteed prices to a system of income support is more complicated in Mexico than in countries with a strong tradition of competitive commodity markets.

for the particular farm by the Department of Agriculture on the basis of historical yields).

On April 4, 1996, the Federal Agricultural Improvement and Reform Act (FAIR) became law, after the longest debate on a farm bill 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 several crops. Participant producers receive these payments as a function of the amount of land registered for government support payments in earlier years. The payments are independent of current production, and farmers therefore have a more flexible incentive structure regarding planting decisions. The payments are fixed annually at a declining rate and under current legislation will end after seven years (see table 2). The practice of leaving land idle, 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. The result is that producers depend more heavily on the market and also bear greater risk from increased price variability.
Assessing the Reform Programs for Efficiency and Equity

On efficiency grounds the three reform programs are improvements. All three are similar in delinking support from current production decisions and in moving toward market-driven prices. All three promote allocative efficiency in that quantity produced and price received are—in varying degrees—independent of the amount of support. Thus, the three income support schemes are among the less distortionary mechanisms for maintaining agricultural incomes above their market outcomes.

All three programs, however, are less than ideal in that the use of land is not delinked from the program. This requirement probably reflects political considerations, as the payments must be seen to be going to “true” farmers. CAP reform requires either that land remains in production of the crops eligible for support or that producers set aside (hold out of production) a predetermined amount of support-crops land. PROCAMPO also holds land in agricultural production but permits a greater variety of crops to be cultivated. FAIR requires that land be kept in general agricultural use, but cannot be switched to fruits and vegetables, while producers must also comply with existing conservation plans. These restrictions obviously reduce allocative efficiency. In developing countries, where landownership records are poor, they may also pose implementation problems because monitoring compliance with cultivation restrictions would be difficult, especially where the average farm size is small. Monitoring such restrictions may also lead to corruption.

Do these reforms promote equity? Because the payments under the new programs depend on the amount of land used for past agricultural production, large farmers will receive the largest payments (although a limit on the total paid to any single farmer will reduce this effect). In industrial countries high or no payment ceilings have been more or less an acceptable practice, because most farmers have been 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 objectives of agricultural policy has been a “satisfactory and equitable standard of living for farmers” (Winters 1989–90:241). This perception is probably decreasing. In the EU the belief is gaining ground that the “vast bulk of CAP money goes to farmers, many of whom are well off.” (Financial Times 1997). In many developing countries (especially in South Asia and Latin America), a few people with relatively high incomes own most of the land; many farmers own little or no land. In these cases, where land is distributed very unequally, unlimited payments will normally be a less appropriate criterion.

But such programs may promote equity in those developing countries with a strong correlation between poverty and degree of subsistence production. Under such a program, poor subsistence farmers with land are better off because they can consume
the previously subsidized commodities and receive cash payments at the same time (see first row of table 1). Mexican farmers who own less than two hectares of land receive more than 8 percent of PROCAMPO payments, although they have historically marketed very little and therefore received little support under the old program because the price guarantees applied only to the traded portion of the commodity (Deininger and Heinegg 1995).

**Fiscal Costs**

The fiscal costs of income support programs can be problematic. Thus far, two of the programs have been more costly than the programs they replaced (at prices prevailing at the time of implementation). The cost of the U.S. program in 1996–97 was estimated at about $5.5 billion, as opposed to $4.2 billion in 1994–95 for deficiency payments (USDA 1996). In Mexico the introduction of PROCAMPO almost doubled the transfers to the agricultural sector—from 6.4 billion new pesos in 1993 to 11.7 billion new pesos in 1994 (SARH no date). Moreover, if the programs are expensive initially, their fiscal cost is expected to remain high because payouts are independent of world prices.

The costs of the new program compared with the old price support program depend on actual world prices. Under high world prices the transfers to farmers under price supports would be low—or would even cease. For example, in the United States, because of the 1996 boom in grain prices, support based on deficiency payments would have been $1 billion–$2 billion—a fraction of the $5.5 billion paid under the FAIR act. Under low world prices, price subsidies would be higher, making the new program a bargain.

**Price and Other Risks**

Replacing stable support prices or guaranteed prices with direct income transfers exposes producers to the risk of volatile market prices. The shock from the exposure to risk would be more prevalent in countries where the government assumed all price risks by maintaining panterritorial and panseasonal prices than in countries with other types of protection, such as subsidies per output unit, floor prices, import tariffs, and possibly nontariff barriers.

Short-term price volatility can be alleviated with devices that mitigate market-based risk, either through private initiative or with public assistance. Forward and futures markets are effective tools that can offer both price discovery and hedging not only to producers, but also to merchants or other concerned parties. Participation in existing futures markets by foreign producers and merchants, however, appears to be limited, especially in cases where the costs of producing and marketing the commodity are predominantly in domestic currency (one
would have to hedge both the commodity as well as the exchange rate). Several developing countries are attempting to create their own futures exchange markets, however.

Government-assisted risk-mitigation devices are another option. In 1997 the U.S. Department of Agriculture introduced revenue insurance against both crop failure and falling prices. Initiated on a pilot basis in the states of Nebraska and Iowa, these revenue insurance policies have sold briskly (Economist 1997). Similarly, Mexico offers a guaranteed minimum price to cotton farmers for a predetermined fee through a government organization, ASERCA. The minimum price is based on the New York cotton futures exchange. ASERCA offers the guaranteed price in U.S. dollars and hedges the risk by using the predetermined 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 the guarantee price. If prices rise instead, ASERCA makes no payment (Varangis and Larson 1996). Because the entire transaction is denominated in U.S. dollars, cotton producers assume the exchange risk. It should be emphasized, however, that private and government-assisted risk-mitigation devices deal with short-term price volatility, that is, one crop cycle at most.

Generally speaking, there are many ways to reduce risk in addition to formal measures. Farmers can grow a variety of crops with different market and climatic risks. Contract farming at fixed output prices eliminates price risk. An off-farm job for a member of the household is also a possibility.

Negative Supply Response

In theory, price and trade reforms can be Pareto improvements. They allow farmers to maintain their incomes at roughly the same levels while inducing growth in the economy through better resource allocation. Nevertheless, the removal of protectionist policies is likely to reduce agricultural output because lower crop prices reduce investment and accelerate the exit from agriculture. This has been the case in the former Soviet economies, frequently dramatically so. In Hungary, for example, market liberalization after 1989 reduced agricultural output by more than one-third and induced the exit from agriculture of one-half the country's farmers.

On balance, the reforms undertaken by the Mexican government in the late 1980s and early 1990s (including the implementation of PROCAMPO) appear to have reduced the profitability of the crop sector (Baffes 1998; World Bank 1996). In the European Union, if recently suggested reforms to the CAP cut preferential assistance to oilseed producers, their income may drop by as much as 20 percent (Oils & Fats International 1997).

Moreover, contraction of the sector inevitably reduces the demand for farm labor, so the income of landless farm workers is likely to decline (at least in the short run), although they may benefit to the degree that the prices of food decline. The removal
of guaranteed prices in Mexico was initially expected to induce a long-term reduction of 6 to 24 percent in the agricultural labor force and a corresponding reduction in grain production of between 11 and 28 percent. (The estimates for the Mexican agricultural sector are from Baffes 1998; Levy and van Wijnbergen 1994; and Burfisher, Robinson, and Thierfelder 1992.) In response to the FAIR Act, U.S. farmers are already shifting land out of maize to soybeans, anticipating changes in the price structures of the two crops.

It is important to be aware of these consequences early on. Otherwise, when the reforms fail to induce a positive supply response or to increase the demand for labor, at least in the short run, the confusion and resistance that is generated could jeopardize the reform process.

Toward a Successful Transition

Although all three programs move in the right direction, the considerations above suggest that they could have been designed and implemented more effectively. For one thing, the programs could have been more comprehensive. In addition reform programs should not restrict land uses, they should not cost more than the subsidization programs they replace, and they should be transitional.

Making Reforms Comprehensive

To realize the full benefits of an income support system, the programs should include all crops and substitute for all existing price support programs. FAIR does not apply to sugar, tobacco, peanuts, and milk, all of which are heavily protected in ways that seriously misallocate resources. And PROCAMPO is restricted to nine commodities; price floors are still in operation for the two basic crops (maize and beans), and several subsidy programs, especially on inputs, are still in place. Although CAP's reform covers most crops and some livestock, it fails to eliminate price supports and retains many quantitative restrictions.

Lifting Restrictions on Land Use

An income support program should not impose restrictions on the use of land. With the exception of environmental considerations, the main justification for restricting land use is to ensure that program payments go only to bona fide farmers. Yet one important reason for replacing subsidies with income support is to encourage individual producers to use resources as relative prices and comparative advantage dictate. Another is that future payments under the income support scheme could be
used as credit collateral or sold outright as an asset, facilitating investment in profitable activities. However, because it is unlikely that lending institutions would have the capacity (and authority) to verify program participation and program compliance, their value as collateral is limited.

Finally, enforcement of restrictions on land-use entails careful, and in some countries relatively expensive, administrative measures. In Mexico the majority of agricultural extension workers employed by PROCAMPO are engaged in monitoring the enforcement of restrictions on land use.¹

**Keeping the Costs Down**

If they are to be politically feasible, income support payments must be designed so that they do not exceed the costs of the programs they replace. For this reason, governments should link payments inversely to world agricultural prices: when prices are high, producers receive lower income support payments and vice versa. Otherwise if world prices rise, producers not only receive these high prices but in addition are subsidized by the program. This imposes an additional burden on taxpayers who must pay high food prices and are also burdened with the program’s costs.

In addition, rather than providing a uniform level of per hectare support, policymakers can set up a declining index with a ceiling. For example, the first 10 hectares receive full support, say $100 a hectare, the next 10 hectares receive less support ($50 a hectare), and so on, effectively increasing the relative support to small producers. If the program is announced before land registration is completed, however, farmers are likely to divide large holdings among family members, in effect neutralizing the effect of a declining index. Similarly, corporate farms can convert to holding companies for a large number of small farms. For the same reasons, such moral hazard also arises with programs that impose ceilings on benefits, such as PROCAMPO and FAIR (see table 2).

Nevertheless limits on the maximum acreage eligible for income support or simple benefit ceilings as in FAIR are equitable devices for containing fiscal costs. Such limits reduce support to larger producers and may promote more equal income distribution. Table 1 shows that such a ceiling can generate substantial savings by reducing the benefits to above-average-yield large producers.

**Limiting the Duration of the Program**

In view of the uncertainties, the programs should be transitional and not permanent. Although PROCAMPO is scheduled to be phased out in 15 years, at which time world prices will prevail, FAIR’s language leaves open the question of support when the program expires after 7 years. Thus far, the CAP is not time-bound, although it is
likely to be subject to another round of reforms. Nevertheless, if the final objective is—as it should be—to eliminate support to producers, the programs should wind down to an explicit expiration date.

It is important to distinguish between the short run and the steady state. Consider the Pareto-improvement element of such programs. Under the assumption that price support programs would have continued indefinitely, an explicit time profile for the income support system implies that such programs are not necessarily Pareto improvements. This is the case because producers who previously were receiving support may be worse off after the termination of the income program than they would have been had price subsidization continued.

Establishing Supporting Institutions

The shortcomings discussed above apply to both industrial and developing countries. But weak supporting institutions are likely to be a problem in developing countries. To ensure that payments to producers are fair (that is, based on the amount of land farmed) and are paid in a timely manner, a national land registry must be developed before initiating the program—something that is extremely difficult to achieve in many countries, for example, those in tropical Africa. The government must also have policy credibility if producers are to react as desired. Credibility was a problem in Mexico, where the amount of land in crops was first under-reported in many areas (due to fear of government taxation), and then over-reported. As of 1993, the final determination of eligible areas had not yet occurred. In many instances, eligible areas were “negotiated” at the community level (Salinger, Metzel, and Arndt 1995).

Clearly the macroeconomic environment, and particularly the exchange rate, should be adequate and stable. In some cases eliminating currency overvaluation may make it possible to eliminate protection without fiscal compensation. If substantial devaluation is likely, a feasible approach to eliminating price supports may be to make explicit the benefits to farmers that result from devaluation and include elimination of agricultural price support as part of the macroeconomic reform package. Finally, efficient and integrated local commodity markets are needed to ensure a smooth transition.

Another set of problems stems from uncertain land tenure rights. Who receives the payment may be an issue, particularly in developing countries. Consider a case where a tenant has cultivated the land for the entire period on which the payments are based. If support is based on land previously allocated to supported crops, the landowner will claim the payments. On equally valid grounds, the tenant may claim the payments because it was his or her cultivation that qualifies the land for support. Resolving this issue will often complicate the implementation process. (The United States has developed an elaborate legal definition of “producer”—including land-
owner, share cropper, or rent-paying tenant—that stipulates the conditions of eligibility for receiving benefits under FAIR.

In the absence of well-defined land tenure rights, appropriate preparation of a transition program may require an extensive survey of the rural economy to identify the distribution of farms operated by owners and those that are not. The survey will indicate the technical feasibility of the program but may also provide information on variables such as the distribution of farm size, yields, and commodities produced. Such information may be needed to design equitable and affordable programs that are politically acceptable; it will also indicate whether direct income support is an appropriate route to reform. These considerations suggest that in many—perhaps most—developing countries, informal land tenure arrangements may preclude subsidies based on land ownership mechanisms. As Binswanger and Deininger (1997:1966) have recently argued: “The costs of maintaining records, negotiating, contracting, and policing property rights can be high and may exceed the value of the land especially in rural areas with low population densities and little market access.”

Concluding Remarks

In designing income support programs, it is well to keep in mind, first, that separating the payments from current production decisions implies consequences that are likely to be perceived as negative in many instances, even though economically rational outcomes are fully expected. Producers will frequently face higher risk from increased price variability. Because the ratio of output to input prices will be lower, agricultural output will decline for the crops in question, which in turn may reduce the demand for agricultural labor. As is the case with other types of support, the politically active large producers who will probably receive the lion’s share of the support may not be 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 reform the CAP.

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

Reforms, therefore, have to be considered within a broad policy perspective. Compensation could, for example, take the form of government-financed investments to benefit producers, such as increased expenditures for rural infrastructure. Most developing countries have an inadequate network of rural roads, inefficient water supply and irrigation networks, and limited electric power. Rural social ser-
vices are also neglected; education and health care in rural areas are inferior to those provided in cities. Supplying credit through group-based lending to microenterprises in high population areas may be another appropriate instrument (Binswanger and Landell-Mills 1995). In Japan, for example, the Uruguay Round Agreement called for permitting imports of foreign rice equal to 4 percent to 8 percent of domestic consumption. Anticipating that this market opening would lead to lower domestic prices for rice and a decline in farmers’ income, the Diet enacted a law that appropriated more than 6 trillion yen (about $60 billion) for compensatory measures to increase farmers’ incomes indirectly through improvement in infrastructure in rural areas, enhancement of agricultural technology, access to credit, and so on (Goto 1997).

To conclude, it is important to recall that a direct income support program is intended to provide a transition from price-distorting subsidies to a liberalized sector that allows resources to be allocated more efficiently. It is not a poverty reduction program, although it can increase the income of subsistence landholders. It is not an investment program because it has no provisions on how the money is to be spent. It is not designed to induce agricultural growth because it lowers producer prices. Finally, because the program is linked to an asset—land—the lion’s share of the payments may go to large producers.

Appendix A. Income Redistribution and Efficiency Losses under an Import Tariff

Let $D_d$ and $S_d$ denote domestic demand and supply of the commodity in question, while $P_m$ denotes the world price, which can also be viewed as the perfectly elastic supply of imports (figure A.1). In a closed economy the market clears at quantity and price dictated by the intersection of domestic demand and supply. If the economy is open, price is $P_t$ and the supply for the commodity becomes $S_d$. Domestic producers supply $OQ_1$ while the remaining $(OQ_0)$ is imported. This is the competitive outcome.

If the government introduces an import tariff $t$, the effective supply schedule becomes $S_d$. At $P_t$ (the new price), consumers demand is $Q_2$. Domestic producers supply $OQ_3$ while the remaining $(Q_2Q_2)$ is supplied by imports. An import tariff has several effects. First, consumers pay a higher price (from $P_m$ to $P_t$) and consequently demand less (from $OQ_0$ to $OQ_2$). Second, domestic producers receive a higher price and hence produce more (from $OQ_1$ to $OQ_3$). Third, the government receives tariff revenue (the area $BGFC$). To summarize, consumers lose while producers and government gain.

The losses to the three groups, however, exceed the gains. The monetary burden on consumers (reduction in consumer surplus) due to the tariff is the area of $P_mP_tFC$,
of which $BGFC$ (the tariff revenue) goes to the government; $P_mP_fGA$ (the change in producer surplus or change in profits) goes to the producers; the triangular area $ABG$ (the excess cost of producing the additional output $Q_1Q_3$) is the efficiency loss, that is, the additional resources that the country uses to produce domestically the commodity that would have been saved, had the corresponding amount of the commodity been imported. Sometimes this area is termed deadweight loss, or Harberger triangle. Finally, the triangular area $CFD$ denotes an additional welfare loss to consumers, or reduction in consumer surplus that is not offset by government revenue from the tariff. Total deadweight losses equal the sum of the two triangles.

After the introduction of the tariff, the relative size of producer gains and consumer losses depends on demand and supply elasticities and the level of the tariff. If the after-tariff price exceeds the price that prevails if the economy is closed, then imports are not taking place. In this case, the government receives no revenue, while the "transfers" take the form of increased producer profits and increased consumer welfare losses.
For agricultural producers the import-tariff setting is analogous to producer price support with no production controls. A similar outcome arises if, instead of taxing imports, the country limits the imported quantity to, say, \(Q_3 - Q_2\). The importers then receive a rent equivalent to the tariff revenue net of the cost of obtaining an import license. Under certain assumptions, importers competing for the import licenses would pay the same in the aggregate for licenses as the tariff forgone.

The fundamental idea behind a Pareto-optimal income support program that compensates for tariff removal goes as follows. After eliminating the tariff, income is redistributed as lump-sum transfers. Producers plus importers (consumers) supply (demand) \(OQ_0\) at price \(P_m\) as in the no tariff scenario. Producers receive as compensation for their losses the lump-sum transfer \(P_mP_iGA\) plus part of the two triangular areas and therefore are better off; the government receives \(BGFC\) plus part of the triangular areas and therefore is better off; consumers pay \(P_mP_iFC\) and part of the two triangular areas but retain the remaining part of the two triangular areas and therefore are better off. Thus, from an efficiency point of view, a lump-sum transfer can be a Pareto improvement.

Going from price to income support, therefore, can be a win-win move. Even if political forces aim to achieve some such outcome, the "transaction costs" involved in moving to the desired outcome may be high. First, consider the difficulties in measuring areas such as \(P_mP_iGA\) and \(ABG\). Such measurement requires knowledge of the yield as a proxy for land-rent, that is, producer surplus, of each producer. It is difficult for governments to acquire such knowledge. Therefore the program must be designed according to an "average yield," which, as table 1 indicates, will overcompensate some producers and undercompensate others. An additional difficulty results from the choice of the base period. Because not all producers allocate the same amount of land to a particular crop each period, different periods will affect producers differently.

Second, there are the implications of the vertical linkages in the particular market. Reducing the price from \(P_t\) to \(P_m\) implies less output and therefore less use of inputs. Because labor is in many instances a major input, the welfare of farm labor is likely to change, independently of what happens to landowners.

Third, there are horizontal linkages. The forces of complementarity and substitutability among products will shift resources from one product market to another (depending on relative prices and the structure of the respective technologies).

Finally, reforms frequently involve altering several policies simultaneously (such as price support, input subsidy, tariffs, and quantitative restrictions). The calculation of the associated benefits and losses by recipient group requires data that practically speaking are virtually impossible to collect.

In summary, the move from price to income support ideally must take into consideration all the difficulties outlined above if the policy change is to be implemented with both increased efficiency and Pareto-optimality. Pareto-optimality as a goal is
helpful in structuring and evaluating proposed reforms. Its achievement is another story.

Notes

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1. Land tenure is one of the most difficult aspects of Mexican farm policy. In addition to private farms, there are quasi-communal farms, the ejidos. Created under the Constitution of 1917, ejidos guaranteed all Mexicans land rights through expropriations of large landholdings. But ejido members' rights over land and water use were restricted. Sale or rental of ejido land was prohibited; members 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 members 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. The titling process has been slow, however. By early 1995, only 20 percent of ejidos had been given land titles (De Janvry and others 1995).

References

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SARH (Secretaria de Agricultura and Recursos Hidraulicos). No date. PROCAMPO: Vamos al Grano para Progresar. Mexico City.


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