
RESEARCH REPORTS AND NOTES

FURTHER ANALYSIS OF THE MEXICAN FOOD CRISIS

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A large and influential body of work has been published on the recent transformation of Mexican agriculture, focusing on how the growth of linkages to the international economy has reallocated Mexico's land and labor resources in a way that threatens the survival of peasant forms of food production.¹ Curiously, the working assumptions of this corpus have remained largely unchallenged in the academic literature. The thrust of this approach is well captured in an article published in *LARR* by David Barkin and Billie DeWalt a few years ago. These authors were seeking to explain the origins of Mexico's "food crisis" and made a series of recommendations for tackling the problem. Although many of Barkin and DeWalt's observations are irrefutable, the framework of their analysis begs a number of questions, and elements within it are mutually inconsistent. Their work merits close attention nonetheless because, unlike much of the literature on the "food crisis," it goes beyond analysis of the problem to make fairly explicit policy recommendations. Because their recommendations are so out of line with the present thrust of Mexican policy, it is instructive to return to their article. Their contribution exemplifies a paradigm that, in rejecting trade liberalization, fails to lend itself to constructive criticism of the policies now being vigorously pursued in Mexico. In challenging Barkin and DeWalt's analytical framework and policy recom-

1. See Barkin and Suárez (1985); Sanderson (1986); and DeWalt (1985).

mendations (from a standpoint that is sympathetic toward trade liberalization), this research note is intended to provoke a lively debate about new ways to conceptualize Mexican food issues.

The ultimate challenge is to explain how the fall in the 1980s in real incomes was distributed among different social groups and to define the best measures that may be taken to enhance the incomes of the poor. The data available do not permit accurate quantification of the extent of malnutrition in Mexico, but Barkin and DeWalt are probably correct in concluding that the nutritional status of low-income groups worsened in the 1980s, with the rural poor being hardest hit.² But instead of looking directly at the nutritional levels and incomes of the poorest groups, Barkin and DeWalt make indirect inferences about this problem based on analyzing trends in the agricultural output mix and Mexico's loss of self-sufficiency in food staples. They fail, however, to demonstrate convincingly that the substitution of traditional staples (maize and beans) with feed crops (notably sorghum) has further impoverished peasant farmers and the rural poor. Also, their argument that government promotion of self-sufficiency would be an effective policy for alleviating poverty and malnutrition contains flaws.

THE NATURE OF THE CRISIS

Barkin and DeWalt have proceeded from the general premise that capitalism's global expansion has led to a change in the technology and product mix of Mexican farmers. In their view, this outcome is one consequence of the process of "internationalization": factor and product markets are subject to a process of global unification, leading producers in all countries to respond to the same set of price signals within a profit-maximizing framework (Palloix 1977). Some scholars would welcome such a development, arguing that it is consistent with a freer trade regime that would produce higher levels of aggregate output and global welfare. Barkin and DeWalt, however, are highly skeptical of this classical thesis of "gains from trade." Their line of reasoning tends to suggest (along the lines of dependency theory) that there is no net gain from trade expansion because the incremental benefits accruing to one group (such as commercially oriented farmers) will necessarily be offset by losses to another group (typically, peasants).

Barkin and DeWalt argue that in Mexican agriculture, broader dif-

2. The only relatively thorough recent data on actual rural and urban diets in Mexico are those collected by the Instituto Nacional de Nutrición in selected urban and rural areas in 1979 (World Bank 1989, 44). In these surveys, serious underconsumption of food was detected in rural areas of Chiapas, Oaxaca, Guerrero, Coahuila, Nuevo León, Hidalgo, Veracruz, and Yucatán. According to Livas and Miranda Mérida (1988), in 1982, fifty million Mexicans (68 percent of the population) exhibited some degree of calorie-protein deficiency.

fusion of profit-maximizing criteria leads producers to stop cultivating food staples (particularly maize and beans) because of the decline in their relative profitability. This trend is associated with a loss of food security for the rural poor as well as a rise in food imports and the loss of national food self-sufficiency. The transformation of production is led by larger farmers, with peasant producers participating to a much lesser extent, although not because they are innately unresponsive to changes in relative prices. Barkin and DeWalt suggest that while Mexican peasants are willing to operate in a profit-maximizing way in principle (1988, 44), in practice, they are prevented from doing so by three key constraints: imperfect markets, limited credit, and inadequate programs for research and technical assistance (1988, 41–44). Because larger producers give up producing the traditional food staples and small producers tend to produce staples primarily for home consumption, the domestic marketed surplus of these goods has not risen in line with demand, making Mexico increasingly dependent on food imports (1988, 43, 46).

According to Barkin and DeWalt, the critical factor in the demise of staple production was the “phenomenal growth in the livestock sector” after 1965. This trend led to feed crops being planted instead of food crops, with the “basic grains” (maize, beans, wheat, and rice) being displaced by soya, alfalfa, sorghum, and oats (1988, 33–34). Barkin and DeWalt’s most important contribution lies in their analysis of why, from the 1960s to the early 1980s, Mexican farmers introduced sorghum, a trend leading to significant displacement of maize, the traditional staple (1988, 32–41). Sorghum has replaced maize on much of the better rain-fed land because it is more resistant to drought and cheaper to produce. Its cultivation requires on average 10.8 days of labor per hectare, as compared with 27.4 days for maize (BANAMEX 1988, 270). Food-feed substitution was also a “demand-driven” process, in their view, a function of growing income concentration: “wealthy and middle-class Mexicans increased their share of national income . . . substantially during the 1970s,” leading to a rapid growth in the demand for meat (Barkin and DeWalt 1988 43, 40).

Thus the market mechanism has led (mainly large) farmers to produce commodities (like meat, fruit, and vegetables) that, according to Barkin and DeWalt, are not generally consumed by “workers and peasants” (1988, 43). These researchers might concede that this trend would not be a problem if the new production strategies had raised the net incomes of peasant producers. They assert, however, that this is not the case: “Most small farmers must stick with their traditional systems and products for lack of resources to plant more profitable crops; many of those who do find nonagricultural alternatives abandon farming completely or relegate responsibility to other members of the family. Lacking credit and having only restricted access to the institutional nexus that facilitates the adoption of new crops and techniques, most rural Mexicans

cannot participate in the prosperity generated by agricultural modernization" (Barkin and DeWalt 1988, 42).

Barkin and DeWalt further suggest as a corollary of this selective process of modernization that peasant land and labor are underemployed. They note that "nine million hectares of arable land were idle during the 1984 summer crop cycle, despite the best rainfall in the past half-century" (1988, 35). Peasants increasingly depend on wages and self-employed earnings in the informal sector, which are obtained primarily from working in Mexican towns and in the United States (Barkin and DeWalt 1988, 46).

Five flaws mar Barkin and DeWalt's analysis of changes in the structure of agricultural production. First, they underestimate the contribution that large farmers make to producing food staples. Second, they make the dubious assumption that small farmers have neither participated in nor benefited from the displacement of staples by feed crops. Third, they potentially underestimate the investment resources at peasants' disposal. Fourth, they fail to take into account the slowdown in the 1980s in the growth of the livestock sector. And finally, Barkin and DeWalt make unwarranted assumptions about the existence of rural underemployment.

The Contribution of Large Farmers

Barkin and DeWalt's argument exhibits a certain inconsistency. On the one hand, they assert that "most commercial farmers do not find it profitable to produce basic grains" (1988, 43). But on the other hand, they note that a substantial part of the best land in Mexico is devoted to grain production: "maize and sorghum . . . presently account for more than one-third of the irrigated land area under cultivation" (1988, 51). More accurately, in 1985–1987, maize and wheat occupied on average 40 percent of the harvested area under irrigation (20 percent for each crop), significantly more than the 12 percent occupied by sorghum (SPP 1988). In other words, many commercial farmers do find it profitable to grow food crops. Consequently, larger farmers contribute significantly to the domestic output of staples. Table 1 shows the breakdown of a nationwide survey of maize producers by farm size. Larger farmers (those harvesting more than ten hectares) accounted for only 2 percent of all producers but contributed 15 percent of total output and 25 percent of the sales of Mexican maize.

Small Farmers and Sorghum

Large Mexican producers have not been the only ones who have tended to substitute sorghum for maize. According to partial results from the 1981 Mexican agricultural census, one-third of all sorghum producers

TABLE 1 *A Survey of Maize Production According to Farm Size, 1984–1985*

<i>Area Harvested^a</i> <i>(Hectares)</i>	<i>Number of Producers</i> <i>(Thousands)</i>	<i>Output</i> <i>(Thousands of Tons)</i>	<i>Sales</i> <i>(Thousands of Tons)</i>
0.0–2.5	1,049 (62.5)	1,678 (27.8)	354 (12.0)
2.6–10.0	601 (35.8)	3,486 (57.7)	1,858 (63.1)
Over 10.0	28 (1.7)	876 (14.5)	731 (24.8)
Total	1,678 (100.0)	6,040 (100.0)	2,943 (99.9)

Source: SISVAN (1988).

Note: Figures in parentheses are percentages for the adjacent Ns. The data were derived from the national survey of production costs carried out annually by the Gabinete Agropecuario. They do not cover all producers. Average national output for 1984–85 was 12,875,000 tons (as compared with 6,040,000 accounted for in this table). Because the smallest farmers were those most likely to have been left out of the survey, the data in the table may slightly overstate the contribution of large producers to total output.

^aMean of spring–summer 1984 and 1985 crop cycles

operated farms smaller than five hectares, and these farms accounted for almost 10 percent of the total area sown in sorghum. Furthermore, small farms probably obtained higher yields than large farms: on small farms, 57 percent of the area under sorghum was irrigated, compared with 45 percent in the case of farms larger than five hectares (see table 2). In other words, Barkin and DeWalt oversimplified the situation in stating that small farmers have not participated in sorghum expansion or that they have lacked the resources to be productive.

Barkin and DeWalt fail to consider that by raising net farm income, substituting sorghum for maize may have positive nutritional consequences for small producers (Norton 1987). In terms of energy efficiency, direct consumption of maize by humans makes more sense than consumption of grain-fed livestock: a given unit of grain input produces a higher nutritional output when the grain is consumed directly. But it is important not to confuse energy efficiency with economic efficiency. Substituting sorghum for maize may be rational from the standpoints of maximizing utility and maximizing profits. If this substitution raises the net farm incomes of peasant producers, it may contribute to alleviating poverty. The possibility of this favorable impact on income distribution merits closer investigation.

Maize-sorghum is not the only axis of substitution in farm activities. Peasants ascribe great importance to backyard livestock as a source of income and a means of saving. Rather than sell the maize not eaten by their families, peasants may choose to use it as feed for pigs and poultry.

TABLE 2 *Sorghum Production in Mexico According to Farm Size, 1981*

Farm Size in Hectares	Number of Producers	Sown Area in Hectares	
		Total	Irrigated
Up to 5	39,000 (34.8)	127,000 (9.2)	72,000 (11.4)
Over 5	73,000 (65.2)	1,251,000 (90.8)	560,000 (88.6)
Total	112,000 (100.0)	1,378,000 (100.0)	632,000 (100.0)

Source: INEGI (1988).

Note: Figures in parentheses are percentages for adjacent Ns. The data in this table refer to the sum of land in the 1980–81 autumn–winter and 1981 spring–summer crop cycles. These data represent no more than a nationally representative sample of the 1981 census results (the full results have not been published).

Thus a decline in the marketed surplus of maize does not necessarily indicate a corresponding rise in on-farm human consumption of this staple, a possibility that qualifies Barkin and DeWalt’s observation about the growth in the fraction of maize held back from the market (1988, 46). Budget data from two farm surveys conducted in the 1980s confirm the importance of livestock income (table 3). The more extensive survey indicates that on farms of four hectares or less, livestock sales account for just over one-quarter of total income, a larger share than was observed for wage earnings. The stereotype of stock raising as the preserve of large *rancheros* has led to a misreading of Mexican peasant economy in that agricultural extension agents have neglected to note this sector’s contribution to small farmer incomes. Referring to these data, Roger Norton has concluded that “at best maize accounts for between one-fourth and one-fifth of the income (including the value of home retentions) on farms of less than four hectares” (Norton 1987, 252).

These observations about the flexibility of substitution among sources of peasant income challenge the validity of the proletarianization thesis implicit in Barkin and DeWalt’s analysis (made explicit in Barkin 1985). By asserting that Mexican peasants have no viable alternatives to producing maize and beans, these researchers suggest that peasants are faced with a stark choice between self-provisioning (leading them to produce more maize for home consumption) or increased dependence on wage incomes. Barkin and DeWalt apparently believe that peasants depend more and more on the second option, as reflected in the policy recommendation of “reconverting rural consumers into producers” (1988, 53). But they underestimate the extent to which peasants are diversified producers. Also, their argument reveals a note of internal contradiction: while they maintain that Mexican peasants are potential profit maximizers who are

TABLE 3 *The Composition of Peasant Household Income in Mexico, 1980–1983, by Percentage of Income Shares*

<i>Income Shares</i>	1983 ^a	1980–1982 ^b	1980–1982 ^c
Maize sales	(23)	—	—
Other crop sales	(12)	—	—
Total crop sales	35	22	33
Livestock sales	11	32	26
Off-farm earnings	25	24	18
Other ^d	29	22	23
Total	100	100	100

Note: In all cases, the data refer to farms under five hectares.

^aDerived from a sample of 354 maize producers drawn from the states of Nayarit, Morelos, Jalisco, and Puebla. This survey was conducted by the Centro de Estudios Educativos (see Figueroa 1986).

^bA nationwide employment survey conducted by BANRURAL, cited by Norton (1987). These data refer to the same states as in those for 1983.

^cData from the same BANRURAL source but covering all Mexican states with the exception of the Distrito Federal, Durango, Mexico, San Luis Potosí, and Sinaloa (for which data were not published).

^dRefers to income from renting out land, machinery, and animals, sales of craftwork, remittances from kin, and the on-farm consumption of crop and livestock output.

sensitive enough to relative price movements to reduce their sales of maize, Barkin and DeWalt seem reluctant to accept the possibility that these same factors may lead peasants to diversify into other activities.

To conclude, Barkin and DeWalt's consideration of the price elasticity of supply of peasant enterprise is insufficiently nuanced. They fail to draw a basic distinction between the propensity to substitute between income sources (such as crops) in response to changes in relative prices and the propensity to increase the total output of the farm. While the supply response is highly elastic in the first instance, it is significantly less so in the second, an observation borne out by evidence from several countries.³ The logic of this finding is unassailable: between crop years, it is easier to switch from one annual crop to another (assuming no big change in input costs) than it is to increase the total area under cultivation, given

3. In this respect, it is unlikely that Mexico represents an exception to the trend observed in other countries. Bapna et al. (1984) estimated one-year elasticities for individual crops from a poor agroclimatic subregion in India, and their results ranged from 0.25 to 0.77 for the main crop, sorghum. But they found the supply elasticity of all agricultural output to be only 0.05. Analyzing the evidence from several developing countries, A. Chhibber concluded that the aggregate supply elasticity of agriculture "is not greater than one, as is sometimes claimed by those who ascribe primacy to price policy, or as low as zero, as claimed by those who view price policy effects as insignificant. It is higher, at 0.6 to 0.9, in the more advanced and land-abundant developing countries, and lower, at around 0.2 to 0.5, in poorer countries with inadequate infrastructure" (Chhibber 1988, 45). Binswanger (1989) contains an interesting discussion of these issues.

the fact that in the short term at least, farmers' supply of land, labor, and capital is constrained.

Underestimation of Peasant Resources

While it is undoubtedly true that small farmers have less access to formal credit institutions than larger producers, it would be wrong to infer that they are therefore unable to expand their enterprises. Barkin and DeWalt overlook the capacity of peasant producers to mobilize resources on their own behalf by such means as intra-family lending and investment of remittances. They allude to the importance of long-distance migration as a peasant survival strategy but give no thought to the role that remittances from the United States may play in expanding and diversifying the farm economy.⁴ Even if they were not invested directly in on-farm production, given the fungibility of cash resources, it would be hard to prove that they had no impact on farm investment decisions.

Although plenty of evidence points to the importance of remittances (Mines and DeJanvry 1982) and the pooling of income between kinship-related households in distinct agroclimatic regions (Rosenzweig and Stark 1989), these topics have been insufficiently researched in Mexico. This gap in the literature has important policy ramifications: focusing the inquiry on the state's failure to provide sufficient credit (or other support) to small producers implicitly endorses paternalistic or *dirigiste* (top-down) development strategies, with the state being conceived as necessarily the prime mover in agricultural development.

Slower Growth of the Livestock Sector in the 1980s

Taking Barkin and DeWalt's account at face value, the reader would never imagine that the growth of Mexico's livestock sector slowed significantly in the 1980s. At 1980 prices, the gross domestic product (GDP) from livestock increased by 1.5 percent per year between 1980 and 1987, somewhat less than the average annual growth of crop-sector GDP (1.7 percent). It is puzzling that although Barkin and DeWalt's article was published in 1988, the data cited stop at 1982. If they had included data from the early to the late 1980s, the slowdown in livestock growth would have been evident. The growth in the average annual tonnage of meat from animals slaughtered in Mexico is shown in table 4. Between 1965 and 1982, cattle tonnage increased by 5.4 percent, pigs by 8.1, and chickens by 7.3 percent. In contrast, between 1982 and 1987, cattle declined by 0.3

4. On the basis of their own fieldwork, Barkin and DeWalt note, "in one community that we studied in San Luis Potosí, more than half of the ejidatarios had worked in the United States as illegal immigrants within the preceding five years" (1988, 39).

TABLE 4 *Animals Slaughtered in Mexico in 1965, 1982, and 1987 (in Tons)*

Year (Source)	Cattle	Pigs	Chickens
1965 (DGEA-SARH 1982) ^a	624,956	572,894	214,485
1982 (DGEA-SARH 1982) ^a	1,200,544	1,365,414	482,491
1982 (SPP 1988) ^b	1,166,144	1,365,414	449,907
1987 (SPP 1988) ^b	1,181,393	914,573	672,093

^aData cited by Barkin and DeWalt (1988, 34), from the Mexican Ministry of Agriculture.

^bData from Secretaría de Programación y Presupuesto (1988).

percent and pigs by 6.6 percent while chickens increased by 7.9 percent. Thus beef and pork production for the domestic market contracted in the 1980s. In the case of beef, this decline was partly offset by a doubling in the number of cattle exported on the hoof (from 542,000 in 1982 to 1,000,000 in 1987). Since 1987, the periodic embargo on cattle exports has been superseded by an export tariff, a trade-liberalization measure designed partly to restore the profitability of cattle raising by facilitating easier access to the U.S. market. But the production of poultry meat (and eggs) was clearly the main growth area, increasing at a faster rate than it did between 1965 and 1982.

In part, the data bear out Barkin and DeWalt's thesis of the *ganaderización* of cropland: the growth of the poultry industry relative to beef is consistent with a shift from pasture-fed to grain-fed livestock, a trend that would bolster demand for sorghum. But the pork industry also relies heavily on balanced feeds, and this sector's contraction thus represents a countervailing trend. Indeed, the average annual rate of growth of the area under sorghum fell from 11.8 percent in the boom period (1965–1980) to a mere 2.8 percent in the 1980s. In the second period (1980–1985), expansion of the area harvested in sorghum outpaced those of maize and beans but was almost equaled by rice and was overtaken by wheat (see table 5).⁵

These recent trends are hardly surprising given the extent of the collapse in real incomes after 1981. Total meat consumption has dropped, and Mexicans have tended to substitute cheaper varieties of animal protein, especially chicken. This pattern qualifies the account given by Barkin

5. In their table 2, Barkin and DeWalt fail to indicate whether they are referring to the sown area or the harvested area. Inspection of their sources (SPP 1988) reveals that Barkin and DeWalt are referring to harvested area. Because of climatic irregularities, this category is not as good a guide to decisions regarding farm production as sown area. Also, to control for rainfall variations, it is best to use three-year averages when presenting data on the area harvested. Barkin and DeWalt fail to note that 1982 was an exceptionally bad crop year. A more reliable picture may be obtained by using the average for 1980–1982. Following this procedure, my own table 2 indicates that for the period 1965 to 1982, Barkin and DeWalt overstate the decline in the area harvested in maize and beans and understate the growth of the area in sorghum.

TABLE 5 *Growth of Harvested Areas in Mexico, 1965–1987*

Crop	Average Harvested Area (in hectares)			Percent Annual Change	
	(a) 1965–67	(b) 1980–82	(c) 1985–87	(a) to (b)	(b) to (c)
Maize	7,872,000	6,693,000	6,932,000	-0.9	0.6
Beans	2,096,000	1,708,000	1,796,000	-1.2	0.9
Rice	153,000	153,000	176,000	0.0	2.5
Wheat	789,000	865,000	1,135,000	0.6	5.2
Sorghum	521,000	1,501,000	1,749,000	11.8	2.8

Sources: For 1965–67, NAFINSA (1979). For 1980–82 and 1985–87, SPP (1988).

and DeWalt, who seem to suggest that the ganaderización of the Mexican diet is inexorable. They appear to argue that the increasing concentration of income is a more critical factor in boosting the demand for meat than the overall growth of national income.⁶ This assertion is questionable. If income concentration has increased aggregate demand for meat, why was domestic beef production so sluggish in the 1980s?⁷ Casual empiricism suggests that rich Mexicans do not yet show the same propensity as their counterparts in the United States to substitute white meat for red for reasons of health, and thus such a pattern of substitution cannot wholly account for the collapse of beef. In effect, the slowdown in the expansion of the livestock sector may be traced back to the mid-1970s. The pace slackened because the daily minimum wage declined in real terms after 1975 (BANAMEX 1985), helping slow the growth in the amount of meat consumed by the urban working class. Needless to say, Barkin and DeWalt would be reluctant to concede that the initial dynamism of the beef industry owed much to increased demand from organized labor because such an admission would not square with their assumption that Third World workers (and peasants) are not significant consumers of meat (Barkin and DeWalt 1988, 43).

Assumptions about Rural Underemployment

A key facet of Barkin and DeWalt’s argument is that small producers lack the capital resources needed to ensure full employment of

6. Barkin and DeWalt allow Timmer et al. to state the case for them: “higher incomes for middle and upper income households may increase demand for livestock products and ultimately reduce food intake of the poor. The large conversion factor between feed grain and meat, coupled with high income elasticities of demand for meat in middle and upper income households, means that societies with highly skewed income distributions have the potential for very rapid increases in grain demand” (Timmer et al. 1983, 51, as cited in Barkin and DeWalt 1988, 40–41).

7. In 1986 demand was so slack that the free-market price of beef was actually less than the controlled urban retail price, according to a Foreign Agricultural Service telex from U.S. Embassy in Mexico City to United States Department of Agriculture, 2 Mar. 1987.

land and labor in the rural sector. This conclusion diametrically opposes that of Peter Gregory, who has convincingly questioned the thesis that a labor surplus existed in Mexico in the period preceding 1982. With respect to labor underemployment, Barkin and DeWalt appear to contradict themselves. They observe that "neither land nor labor is fully used" (1988, 46), but in the note to the same sentence they seek to reconcile their position with Gregory's by asserting, "We do not argue that labor markets are out of equilibria (that there is substantial underemployment) at present market prices. We argue instead that given the present managed price structure for rural labor and the dearth of employment opportunities in Mexico, a remunerative price for production of basic grains by small farmers would induce a substantial increase in the supply of labor available to cultivate idle land" (n. 17).

First, it is not clear what Barkin and DeWalt mean by a "managed price structure for rural labor," which would surely entail widespread adherence to the official minimum wage or unionization or both, circumstances not particularly characteristic of the rural Mexican labor market. More important, their assertion about "the dearth of employment opportunities in Mexico" does run counter to Gregory's thesis, which maintains that little evidence exists of rural underemployment.⁸ Gregory argues that the rapid growth of mechanization in the rain-fed areas and the trend toward crops that are less labor-intensive are "possible responses to a tightening rural labor market in which the cost of labor is rising and in which absolute scarcities may be occurring at critical times in the cropping cycle" (Gregory 1986, 138). Past estimates of rural underemployment are misleading because they underestimate the off-farm dimension of rural enterprise. Thus "the practice of measuring underemployment by deducting from the presumed size of the agricultural labor force the number of work days required for recorded levels of output overlooks the importance of employment outside the agricultural sector. By treating the agricultural sector in isolation, one can uncover a huge surplus of labor. However, what may appear to be a surplus to the agricultural sector may not be surplus to the economy as a whole" (Gregory 1986, 138).

This statement conveys a powerful insight. It runs counter to Barkin and DeWalt's assertion of a "dearth of employment in Mexico," but in one sense it is reconcilable with the thrust of their argument in note 17: if changes in price policy were to shift the internal terms of trade in agriculture's favor, the rural labor force would devote more time to farm work

8. Although Gregory bases this conclusion on pre-1983 trends, it is not clear that the collapse of growth after 1982 led to a rise in rural underemployment. For example, there is no evidence that the slump in the construction industry led to a massive return migration to the countryside that would have boosted the availability of labor in the agricultural sector. If anything, migration to the United States occurred and possibly a switch from wage-employment to informal-sector employment in Mexican cities.

and spend less time in off-farm employment. Yet one nuance of Barkin and DeWalt's argument (related to the wholesomeness they ascribe to the allegedly cooperative mode of peasant production prior to capitalist penetration) is that increased recourse to off-farm employment is tantamount to impoverishment (1988, 41). This hypothesis remains to be proved.⁹

A final point concerns Barkin and DeWalt's assumption that, given the current unfavorable price regime, large tracts of agricultural land in Mexico are left idle. Although this assessment is probably correct at the sectoral level, the level of underexploitation of farmland varies directly with the size of the farm enterprise. Even in 1981, one of the best crop years in recent history, the agricultural census reveals that 25 percent of the productive land in holdings was not exploited for crops, livestock, or forestry in the main crop cycle (from April through September). But in the case of farms of five hectares or less, only 6 percent of productive land was left idle during this period (INEGI 1988). In other words, despite peasant producers' alleged shortage of capital or lack of institutional support, they do not bear prime responsibility for the idling of Mexican farmland. This finding runs counter to Barkin and DeWalt's assertion that "small agriculturalists . . . increasingly find themselves with no alternatives but to stop producing marketable surpluses or abandon cultivation altogether. As a result, large extensions of land are no longer systematically cultivated" (1988, 43).

Barkin and DeWalt give insufficient credit to the resilience and resourcefulness of peasant enterprise. Despite the growing importance of off-farm work and long-distance migration, peasants still contrive to keep their land in production. Frequently some members of the household (or extended family) are unable to migrate and assume responsibility for the land, often on a sharecrop basis: the migrants finance capital inputs, those who remain behind provide labor, and the crop is shared equally between the two parties (Finkler 1978; Mummert 1987; Mines and DeJanvry 1982).

POLICY ISSUES

Barkin and DeWalt make a series of policy recommendations that are designed to alleviate Mexico's "food crisis."¹⁰ They are concerned pri-

9. Gregory reiterates this point: "Nor is off-farm work to be viewed as an act of desperation on the part of impoverished farm households" (1986, 139).

10. Eight major recommendations may be identified in Barkin and DeWalt's article. One, redirect agricultural research to meet small farmer needs (pp. 47-48). Two, develop nongrain feed sources for livestock (p. 49). Three, restrict and redirect food and feed subsidies (pp. 49-50). Four, increase irrigation water rates (p. 50). Five, change the price structure for basic food grains (p. 50). Six, focus sorghum cultivation on marginal crop land (p. 48). Seven, increase government credit and crop insurance to small farmers (p. 50). Eight, promote domestic food self-sufficiency (p. 52). The first four points are basically sensible, and this critique will therefore focus on problems arising from the last four recommendations.

marily with reversing policies that they consider to have led resources to be allocated according to comparative advantage rather than in a manner consistent with attaining food self-sufficiency. This position can be challenged on three counts. First, Barkin and DeWalt attempt to argue that the comparative-advantage thesis is of dubious relevance to Mexican peasant agriculture, but their arguments fail to convince. Second, evidence suggests that the Mexican government's farm policies have generally not been consistent with the comparative-advantage principle. Third, it is doubtful that a priori grounds exist for asserting that a comparative-advantage orientation is likely to be more harmful to peasant farmers than a strategy based on food self-sufficiency.

Relevance of Comparative Advantage

Barkin and DeWalt argue that attempts by the Mexican government to restructure agriculture in line with the principle of comparative advantage have failed to benefit peasant farmers for three reasons. The first is that peasants lack the "complementary material and technical resources" that they need to "transform their parcels into modern productive units" (1988, 45). This line of reasoning suggests that peasants need the state to provide them with resources, thus underestimating the capacity of small farmers to mobilize savings on their own behalf. As it stands, the statement is too vague and fails to specify what kinds of support the government might feasibly provide.

Second, Barkin and DeWalt note that the theory of comparative advantage presupposes full employment, which they assume does not obtain in rural Mexico (1988, 45–46). As noted, this assumption remains unproved, and in many ways, Gregory's (1986) interpretation of the data remains more compelling.

Third, Barkin and DeWalt observe that "imports of (relatively) inexpensive staple foods" benefit urban consumers more than their rural counterparts due to imperfectly competitive marketing and transportation networks that force up food prices in the countryside, making it all the more imperative for peasants to adopt self-provisioning strategies (1988, 46). There is no doubt that Mexican rural consumers pay more for their food than urban consumers, owing partly to the higher per unit operating costs of rural traders and the urban concentration of subsidized food outlets. But this situation does not argue for shutting out cheap imports because in the absence of such imports, prices in the rural areas would be even higher.

This point is acknowledged elsewhere by Barkin and Blanca Suárez (1985) in their writings on CONASUPO's regulation of grain markets. The parastatal has resorted to maize imports whenever (owing to harvest shortfalls) the domestic equilibrium price has showed signs of greatly

exceeding the guaranteed price. Thus the official price serves as a ceiling rather than a floor, a circumstance to which maize farmers have naturally objected. Yet this policy may have offered some incidental protection to significant numbers of the rural poor who are net buyers of maize.

Inconsistency of Mexican Farm Policies with Comparative Advantage

Barkin and DeWalt are wrong to assert that the Mexican government carefully tailored its agricultural policies to comparative-advantage criteria. It may be moving in that direction at the moment but was not doing so in the period that Barkin and DeWalt refer to, and certainly not before Mexico joined the GATT (General Agreement on Tariffs and Trade) in 1986. If comparative advantage had been the guiding principle before 1986, the government would not have intervened through the mechanism of support prices and input subsidies. The effect of these interventions has been to alter the relative costs of different farm activities so that the pattern of resource allocation is shifted away from what would prevail in a free-trade scenario.

The ratio of domestic prices to import prices gives some indication of the nominal protection extended to Mexican crop producers (table 6). These data suggest that the system of support prices has consistently protected maize producers but has negatively protected the producers of sorghum, wheat, and rice. In comparing the guarantee price and the border price during the period from 1970 to 1988, maize was positively protected for fifteen of the nineteen years, compared to six, two, and one years respectively for sorghum, wheat, and rice (see table 6). The level of nominal protection implicit in the average rural price closely approximates that provided by the guarantee price, suggesting that the state has effectively dictated the price that Mexican farmers receive for basic grains. In these terms, many farmers were worse off as a consequence of state intervention in grain markets than they would have been in a liberal trade regime with no restrictions on foreign trade. Contrary to Barkin and DeWalt's assertion, it is the government's failure to keep Mexican prices in line with world prices that has hurt Mexican farmers (particularly commercial farmers), not adherence to comparative-advantage principles. In this respect, however, maize producers have received more protection than the producers of less traditional food grains.

Clearly, it is important to consider effective as well as nominal protection: a negative price wedge between domestic and border prices may be partially or fully offset by input subsidies and the protection implicit in post-1982 undervaluation of the exchange rate. Myles Mielke (1989) has examined the impact of fertilizer subsidies and preferential interest rates on the overall protection of maize, wheat, and sorghum producers from 1982 to 1987. He concludes that when the effects of price supports, input

TABLE 6 Ratio of Domestic Price to Import Price of Grain Crops, 1970–1988

Year	Maize		Wheat		Sorghum		Rice	
	Average Rural Price	Guarantee Price	Average Rural Price	Guarantee Price	Average Rural Price	Guarantee Price	Average Rural Price	Guarantee Price
1970	1.07	1.12	1.05	1.00	0.85	0.82	0.85	0.79
1971	1.09	1.14	0.99	0.91	0.84	0.78	1.00	0.90
1972	1.14	1.19	0.88	0.83	0.94	0.92	0.83	0.90
1973	0.82	0.69	0.47	0.46	0.65	0.58	0.51	0.35
1974	0.80	0.82	0.56	0.54	0.75	0.65	0.55	0.62
1975	1.15	1.08	0.87	0.88	1.03	1.05	0.86	0.77
1976	0.89	0.78	0.61	0.62	0.72	0.70	0.82	0.81
1977	1.19	0.98	0.83	0.80	0.90	0.91	0.67	0.69
1978	1.15	1.14	0.83	0.83	0.95	0.86	0.59	0.52
1979	1.21	1.20	0.76	0.77	0.92	0.85	0.74	0.67
1980	1.56	1.39	0.85	0.83	1.06	0.88	0.81	0.62
1981	1.58	1.85	1.01	1.00	1.13	1.15	0.81	0.77
1982	1.29	1.32	0.67	0.72	0.78	0.77	0.83	0.77
1983	1.14	1.08	0.69	0.90	0.72	0.74	0.72	0.85
1984	1.40	1.34	0.91	0.99	1.12	1.05	1.22	1.07
1985	1.68	1.31	1.00	0.82	1.18	0.85	1.44	0.99
1986	1.54	1.54	0.82	0.93	1.47	1.08	1.06	0.80
1987	1.64	1.82	0.75	0.75	1.63	1.22	0.86	0.71
1988	1.56	1.44	0.92	0.93	1.56	1.03	0.72	0.50

Source: World Bank, *Mexico: Agricultural Sector Report* (Washington, D.C.: World Bank, 1989).

Note: Each of the coefficients is calculated by dividing the domestic price of each crop by its import price. Regarding the two measures for domestic price, "average rural" refers to the price prevailing on rural markets (that is, not at the farm gate) and "guaranteed" refers to the price paid when the crop is sold to the state marketing agency, CONASUPO. The import price is defined as the price at U.S. gulf ports plus freight and handling charges involved in delivery to Mexican gulf ports (the c.i.f. price). The import price has not been adjusted to allow for transport and marketing costs within Mexico, and therefore the data give only an approximate guide to rates of nominal protection.

subsidies, and exchange-rate undervaluation are aggregated, maize and sorghum were highly protected, and wheat to a much lesser extent. Thus in 1985–1987, the overall subsidy averaged 67 percent of domestic output value in maize, 61 percent in sorghum, and only 6 percent in wheat.

Mielke found that input subsidies declined in proportional significance, with price supports contributing more to the overall level of subsidy in 1985–1987 than they did in 1982–1984. He was unable, however, to obtain data on irrigation subsidies, a significant omission. Farmers in the irrigation districts pay a water rate far lower than the level that would be consistent with autonomous financing of the operation and maintenance costs incurred by the irrigation works. In 1972 users of agricultural water

paid 93 percent of the cost of electricity used in pumping, but by 1983, the level of subsidy had increased to the point that users paid only 10 percent of the full cost. Since the mid-1980s, the Mexican government has pledged to increase the share of water costs borne by producers, but little progress has been made in this direction so far (Montañez 1988).

To conclude, Barkin and DeWalt's assertion that the Mexican government has pursued an agricultural policy in line with comparative advantage is hard to substantiate when the requisite data on producer subsidies are taken into account. Interpretation of these data is by no means unproblematic, but Barkin and DeWalt might at least have grappled with the evidence concerning rates of nominal and effective protection. Their thesis that Mexican agriculture and peasant producers in particular have been ill served by state intervention is tenable, but for precisely the opposite reason that they give. It is protection—not trade liberalization—that has hurt Mexican farmers. Although maize and sorghum producers have been subsidized by the Mexican government, the key point is that urban manufacturers have been subsidized to an even larger extent. Consequently, the price of nonfarm traded goods has risen faster than that of farm tradables, meaning that the purchasing power of farmers has fallen over time. As in many other developing countries, the pattern of protection in Mexico has discriminated against agriculture, with adverse consequences for agricultural growth and the nutritional status of the rural population.¹¹

In Mexico the "urban bias" implicit in pricing policy (Lipton 1977) may be traced back to 1950, when the congress expanded the federal government's powers to regulate prices. This legislation broadened the scope of price regulation from primary necessities to general foodstuffs, gave the president broad authority to set prices by decree, and created a special price bureau to implement the law. According to one World Bank report, "Immediately thereafter, crop prices, which had previously been rising in real terms, began a decline from which they have never recovered" (World Bank 1989, 4–5; see also Goodman et al. 1985). By focusing narrowly on the issue of food self-sufficiency, which according to Barkin and DeWalt's opening sentence, "was achieved . . . in the thirty years prior to the mid-sixties,"¹² they convey a false impression about the causation and timing

11. This point can be demonstrated by comparing the ratio of the effective rate of protection for agriculture to the effective rate for manufacturing. When the ratio is less than 1.00, protection favors industry rather agriculture. In Mexico, the relative protection ratio was 0.79 in 1960 and 0.88 in 1980. Discrimination against the agricultural sector was actually less marked in Mexico than in Brazil in 1966 and Argentina in 1969, where the relative protection ratio in both countries was 0.46. In Korea, by contrast, the pattern of protection shifted increasingly in agriculture's favor, with the ratio rising from 1.18 in 1968 to 1.36 in 1982 (World Bank 1986, 62).

12. This opening statement is rather incautious. Although perhaps a minor point, it should not be forgotten that Mexico had an agricultural trade deficit in the mid-1940s (Heath 1990a).

of the Mexican agricultural crisis. The decline in real farm prices was the key cause. Although the worst symptoms of this decline (such as deterioration of the sectoral trade balance) may not have manifested themselves until after 1965, the wrong turn was taken in 1950 when Mexico, like other Latin American nations, embarked on a program of import-substituting industrialization that operated at the expense of agriculture.

CONCLUSION

The thrust of Barkin and DeWalt's argument is that producers of basic foods need more protection and more government support if food self-sufficiency is to be achieved. They are committed to the provision of "preferential price supports for crops grown for direct human consumption" (1988, 50). By inference, the government should intervene in the market to redress the innate profitability of sorghum relative to maize. But use of the guaranteed price mechanism in the past has not fostered significant growth of basic food crops, and its efficacy in raising peasant incomes is highly questionable.

In the first place, guaranteed prices cushion large farmers more than they enhance the income security of small farmers. Small maize growers (those harvesting less than 2.5 hectares of this crop) account for 63 percent of all maize producers but contribute only 12 percent of domestic maize sales (SISVAN 1988). The large number of producers who grow maize primarily for on-farm consumption do not benefit from the support price program.¹³

Second, by changing the relative level of risk, support prices boost the attractiveness of low-margin crops in the regime (like grains) when compared with high-margin crops outside the regime (like fruit and vegetables). This bias encourages diversion of the most productive (irrigated) land into low-margin, non-labor-intensive grain production,¹⁴ a circum-

13. In this connection, Rodríguez has noted that one of the challenges facing agricultural policymakers is "to dispense with the practice of conceding guaranteed price increases whenever producers request them. In response to a price rise, producers tend generally to pay less attention to improving land productivity and reducing costs. . . . Maintaining the level of production solely by reliance on higher guaranteed prices penalizes the nonfarm population by obliging them to subsidize agricultural producers. This is acceptable when it leads to higher output but not when it provides a cushion for inefficient producers" (Rodríguez 1988, 623, my translation).

14. Cultivation of fruit and vegetables absorbs much more labor than grains. In terms of days of labor per hectare, the average requirements of key Mexican crops rank in this order: strawberries, 759.5; tomatoes, 122.3; melons, 94.4; maize, 27.4; beans, 25.2; rice, 22.4; sorghum, 10.8; wheat, 8.2; and safflower and soybeans, 6.1 each (BANAMEX 1988, 270; see also Norton 1987, 259).

stance that Barkin and DeWalt concede is undesirable (1988, 51).¹⁵

Finally, it is not clear that a massive increase in the guarantee price (which to be effective would presuppose locking out cheap imports) is feasible or sustainable. Despite their assurances to the contrary, Barkin and DeWalt's commitment to boosting guaranteed prices would probably impose a politically unacceptable fiscal burden.¹⁶ In the case of food staples, a variable levy (similar to that employed by the European Community) might be a more viable strategy of price stabilization. According to this scenario, the government would establish a reference price for maize, based on a five-year average of the international price. If in any given period the world price fell beneath the reference price, a tariff would be imposed so that the price of imported maize would remain equal to the reference price. If the world price rose above the reference price, the tariff would drop to zero.

This method of price stabilization has three advantages when compared to a guaranteed price system. First, because the reference price is periodically adjusted, domestic prices do not get seriously out of line with world prices.¹⁷ Second, the tariff brings in revenue for the government. Third and most important, grain trading is left entirely in the hands of the private sector. The government does not incur the cost of storing and administering buffer stocks, an enormous fiscal burden in Mexico after 1970. This strategy would not be advocated by free-trade purists, but it may be acceptable to Mexico because by stimulating Mexican production of basic grains, it goes some way toward addressing the concerns about food security voiced in the past by Mexican policymakers and scholars.¹⁸

15. This statement is partly contradicted by Barkin and DeWalt's earlier comment about the need to "free up the better rain-fed and irrigated lands to be returned to growing food staples or planted with high-value export crops" (1988, 48). This contradiction is ironic because here Barkin and DeWalt appear to be adopting a line of reasoning consistent with the comparative-advantage thesis, criticizing the government for promoting policies that discourage land from being put to its most profitable use.

16. Barkin and DeWalt note that "the cost of such a program is estimated to be less than the recurring cost of importing food and could be financed from savings from reorganizing the subsidy programs . . . and a rise in the cost of basic foods for urban consumers" (1988, 52). The evidence for this statement (a study by the Mexican research institution EcoDesarrollo) is alluded to in endnote 19 but is not laid out in full, as it should have been if their recommendation is to be taken seriously. Barkin and DeWalt fail to mention that since 1985, the government has taken some steps to rationalize the subsidies that CONASUPO applies to the retail prices of basic food items. A kind of food-stamp program has been used to ensure better targeting of maize subsidies (*tortibonos*), and bread prices have been allowed to rise. CONASUPO has also scaled back the considerable transport and handling subsidies that were formerly implicit in its sale of feed grains to manufacturers. Nevertheless, political will is still lacking for urban food prices to rise to a free-market level, and as Barkin and DeWalt acknowledge, this attitude is a major constraint on improving farm incomes.

17. This argument assumes, contrary to Barkin and DeWalt's position, that resources should be allocated to reflect comparative advantage.

18. First, the fear has been expressed that the United States (as the main exporter of grain to Mexico) will use the threat of an embargo to obtain leverage across a broad spectrum of

Good a priori grounds exist for assuming that the impact of such a strategy on the poor will be more favorable than the trade-restricting, self-sufficiency scenario proposed by Barkin and DeWalt. They evidently remain in thrall to the approach of SAM (the defunct Sistema Alimentario Mexicano), as reflected in their comment that during SAM's short tenure (1980–1982), the decline in production of basic grains was “briefly slowed” (Barkin and DeWalt 1988, 36). Austin and Esteva (1987) have offered a net positive assessment of SAM, but the evidence that it favorably affected output growth remains inconclusive. More important, it can be argued that the oil-boom revenues that underwrote the program also helped to undermine it via the “Dutch disease” phenomena: high inflation, an overvalued exchange rate, deterioration of the agricultural trade balance, and a shift of internal and external terms of trade against agriculture.

SAM did not produce dramatic changes in the agricultural incentive structure. Basic crop prices increased by 10 percent in real terms in 1980 but reached only 95 percent of 1960 levels before beginning to erode in the face of accelerating inflation. Total government expenditures increased from 28 percent of GDP in 1979 to 42 percent in 1982, helping boost inflation from 26 percent in 1980 to 102 percent in 1983. While public spending on agriculture increased in absolute terms under SAM, the sector's share of total expenditure fell. Thus the increase in agricultural expenditure did nothing to redress the historical bias against the sector (World Bank 1989, 8). Given the poorly targeted nature of food subsidies (a circumstance that Barkin and DeWalt fully acknowledge), it is unlikely that government assistance to the rural poor under SAM or afterward was sufficient to offset the adverse impact on them of a general rise in food prices. Moreover, peasant purchasing power was eroded by the slower growth of farm prices relative to nonfarm prices.

One element of the SAM program was increased credit and crop insurance coverage for small farmers, a point that remains one of Barkin and DeWalt's key priorities. Yet the effectiveness of this approach remains in doubt. Expansion of lending operations by state development banks (BANRURAL since 1975) has proved to be fiscally unsustainable due to high default rates. The crop insurance program, operated by the state enterprise ANAGSA, has been bankrupted by fraudulent claims (from which BANRURAL and ANAGSA officials probably derived more benefit than claimant farmers). These problems have been compounded by the long tradition of using political criteria rather than creditworthiness to screen loan applicants (Rello 1987; Heath 1990a). Also, BANRURAL has insisted on providing inputs in kind. These are usually delivered too late

issues (Luiselli 1982; Norton 1987, 248). Second, it has been suggested that Mexico's rail and harbor network would be insufficient to cope with the increased volume of imports that a fully liberalized trading regime would entail (Warman 1983, 218–19).

in the crop cycle to be fully effective and are often inferior to the inputs available from private suppliers. Indeed, the poor quality of hybrid varieties supplied by the state-owned seed manufacturer is often alluded to by farmers and has been acknowledged by one of Barkin's research collaborators (Suárez 1982–83). A final limitation of the state's credit program has been its failure to encourage peasants to save on their own behalf. Under SAM, interest rates were negative for savers as well as borrowers. Also, during and after this program, BANRURAL made no attempt to mobilize deposits. Here Mexico could learn from the post-1987 experience of Brazil: the introduction of rural savings deposits that offer positive rates of interest has met with a rapid take-up rate among small farmers. A large body of literature (reviewed in Adams and Vogel 1986) has demonstrated that cheap credit has generally failed to stimulate agricultural growth or to improve rural income distribution. Regrettably, Barkin and DeWalt fail to acknowledge this important body of work.¹⁹

As an alternative to guaranteed price or subsidized credit interventions, the government could also enhance incomes from small farms by sponsoring research and extension programs designed to raise yields. This recommendation is the soundest one made by Barkin and DeWalt. In the tradition of Farm Systems Research (FSR), they advocate a holistic approach to the farm that involves simultaneous striving to improve crop, livestock, agroforestry, and other resources and avoiding the commodity-specific approach that has characterized research and extension initiatives in the past. Yet there is one problem with the FSR approach that Barkin and DeWalt fail to mention: by focusing on the linkages among various on-farm activities, FSR researchers sometimes neglect the positive opportunity costs involved in farm work. Adoption of a more labor-intensive technology package involves a trade-off in terms of foregone income from off-farm work. For example, the limited success of Plan Puebla may be attributed partly to small farmers' reluctance to spend more time on the farm (Villa Issa 1977, 216; Redclift 1983). Like other FSR proponents, Barkin and DeWalt overlook the significance of this trade-off because they assume a surplus of rural labor that would make farmers unconditionally ready to accept more on-farm employment.

The development and diffusion of better technology packages will be a slow process, and it offers no immediate answer to the problem of rural poverty. Although such packages may enhance peasant incomes in the longer term, it must be acknowledged that a significant number of the

19. Barkin and DeWalt indicate that they favor targeting credit toward strategic small-farm products, like maize or backyard livestock (1988, 50). In practice, credit is fungible and the targeting of objectives is subverted. The key point against targeting is that farmers know better than credit institutions what products are agronomically feasible and economically desirable. They should be allowed to produce whatever they wish. Farmers should also be free to choose the inputs they wish to purchase.

rural poor have so little land at their disposal that they are unlikely to benefit much from improved research and extension strategies.²⁰ The best way to help the poorest of the rural poor is to promote the growth of wage employment. In Barkin's terms, this may amount to "proletarianization," but it need not entail immiseration. Also, as Barkin and DeWalt sensibly suggest, further progress can be made in directing food subsidies and other welfare interventions away from relatively more privileged urban groups.

20. In 1981 one-third of Mexico's farmers operated farms of two hectares or less (INEGI 1988).

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