4

Agricultural policies in developing countries

Exchange rates, prices, and taxation

Increased production of food and cash crops and higher rural incomes have been important objectives for governments of developing countries. In pursuing these objectives, governments, with the support of foreign assistance, have made substantial public investments to improve the physical infrastructure in rural areas, expand irrigation and flood control, and organize research and extension in agriculture. Resources have also been directed to programs which aim to raise productivity through better farm management and improved rural health and education services. In many cases, these efforts have succeeded in raising food production, as shown in Chapter 1. The spread of the Green Revolution in rice and wheat is testimony to the effectiveness of public expenditures in research and irrigation.

The general economic policies that developing countries have pursued have, however, limited the growth of agricultural production and hampered efforts to reduce rural poverty. In many cases, sector-specific pricing and tax policies have also resulted in substantial discrimination against agriculture. In addition, government interventions at all stages of production, consumption, and marketing of agricultural products and inputs, though undertaken to improve the efficiency of markets, have frequently resulted in greater inefficiencies and lower output and incomes. As a consequence, farm incomes in many developing countries are stagnating, and little progress is being made in overcoming the problems of poverty.

Paradoxically, many countries which have been stressing the importance of agricultural development have established a complex set of policies that is strongly biased against agriculture. Thus, some developing countries impose taxes on agricultural exports while lamenting the adverse impact of declining commodity prices on the farm sector. Some pay their producers half the world price for grains (or even less), and then spend scarce foreign exchange to import food. Many have raised producer prices at various stages, but have followed macroeconomic and exchange rate policies that have left real producer prices unchanged or lower than before. Many have set up complex systems of producer taxation, and then have set up equally complex and frequently ineffective systems of subsidies for inputs to offset that taxation. Many subsidize consumers to help the poor, but end up reducing the incomes of farmers who are much poorer than many of the urban consumers who actually benefit from the subsidies. Most developing countries pronounce self-sufficiency as an important objective, but follow policies that tax farmers, subsidize consumers, and increase dependence upon imported food.

The discrimination against agriculture derives from several factors. First of all, it is very much an integral part of development strategies that promote domestic industries behind high trade barriers. Such strategies are intended to accelerate the shift of resources out of agriculture by lowering its profitability compared with that of industry: in other words, by turning the internal terms of trade between agriculture and industry so that agriculture is worse off than it would be if domestic prices were aligned with relative world prices. Agricultural exports suffer as a result; so do agricultural products that compete with imports. This is not just because their domestic prices become lower relative to the prices of protected industrial products, but also because the costs of the industrial inputs the farmers use increase. Moreover, the protectionist policies result in an appreciation of the real exchange rate. This means that traded ag-

ricultural goods become less profitable than nontraded goods, with further adverse consequences on developing countries' agricultural exports.

During the past fifteen years, this traditional bias against agriculture has often been exacerbated by the way countries have responded to changing economic circumstances. Some countries have failed to adjust exchange rates sufficiently in periods of rapid inflation, thus allowing their exchange rates to become overvalued, and have relied instead on excessive foreign borrowing and on ad hoc exchange and trade controls. Such ad hoc measures usually come on top of more permanent trade restrictions and make the discrimination against agriculture worse.

Sectoral policies that keep the domestic farm prices of agricultural products below their world prices at country borders (adjusted for internal transport and distribution margins) have also contributed significantly to the bias against agriculture. It makes little difference from this point of view whether farmers receive low prices because of taxes on their outputs or because of excessive margins charged by parastatal marketing agencies. The effects of low prices for farm output are not generally offset by the subsidies that many governments provide on credit and modern farm inputs. Typically, these subsidies lead to rationing and shortages and benefit larger and better-off farmers more than smaller and poorer farmers.

This chapter discusses the extent to which economy-wide trade and exchange rate policies, as well as sectoral tax and price policies, discriminate against agriculture in developing countries and examines the effects of this discrimination on agricultural output and incomes. It also discusses how costly agricultural taxation can be in practice and points to several alternative ways of moderating the costs.

The next chapter reviews the rationale for government programs for price stabilization, consumer subsidies, and producer input subsidies—all three of which are used to promote a variety of distributional and income objectives. It is shown that these programs are far less effective than they are thought to be in promoting either a more efficient allocation of resources or a more even distribution of income.

Economy-wide policies and agriculture

Trade, exchange rate, fiscal, and monetary policies have a significant impact on agriculture in developing countries, and their effects often overshadow those of sector-specific policies. These policies are leading determinants of the movement of capital and labor between agriculture and the rest of the economy, the growth and composition of agricultural output, and the volume and composition of trade in agricultural products. They are often the principal sources of bias against agriculture, and as such they inhibit the growth of real incomes in rural areas, where the concentration of poverty is greatest.

Sources of bias

Many developing countries have continued to promote industrialization through generous protection to industry. This strategy increases the prices of industrial import substitutes relative to the prices of agricultural import substitutes and exports. It also raises the prices of protected farm inputs. By lowering output prices relative to industry and by increasing the cost of modern inputs, inward-looking strategies implicitly tax agriculture. Table 4.1 gives some indication of how the differential protection given to industry has lowered the relative profitability of agriculture in many

Table 4.1 Protection of agriculture compared with manufacturing in selected developing countries

Country and period	*Year*	*Relative protection ratio*[a]
In the 1960s		
Mexico	1960	0.79
Chile	1961	0.40
Malaysia	1965	0.98
Philippines	1965	0.66
Brazil	1966	0.46
Korea	1968	1.18
Argentina	1969	0.46
Colombia	1969	0.40
In the 1970s and 1980s		
Philippines	1974	0.76
Colombia	1978	0.49
Brazil[b]	1980	0.65
Mexico	1980	0.88
Nigeria	1980	0.35
Egypt	1981	0.57
Peru[b]	1981	0.68
Turkey	1981	0.77
Korea[b]	1982	1.36
Ecuador	1983	0.65

a. Calculated as $(1+EPR_a)/(1+EPR_m)$, where EPR_a and EPR_m are the effective rates of protection for agriculture and the manufacturing sector, respectively. A ratio of 1.00 indicates that effective protection is equal in both sectors; a ratio greater than 1.00 means that protection is in favor of agriculture.
b. Refers to primary sector.

countries. The ratios in the table show the extent to which value added in agriculture has been protected relative to value added in industry. With the sole exception of Korea, all countries in the sample discriminated against agriculture, especially Nigeria, Colombia, and Egypt.

But this is not the only way inward-looking strategies affect agriculture. There is another effect that works through the real exchange rate (the ratio of the prices of traded goods to the prices of nontraded goods). Industrial protection makes the real exchange rate lower than it would be otherwise. Thus, the production of import substitutes and exports in agriculture suffers for two reasons: increased profitability of protected industrial outputs and increased profitability of nontraded goods. Resources move from the traded agriculture sector to these other sectors, and as they do, rural real wages may rise; this increases the cost of farming, which is typically very labor-intensive in developing countries.

Several studies have shown how policies that protect industry affect the prices of agricultural products compared with the prices of protected industrial products and of nontraded goods. In the Philippines, from 1950 to 1980, heavy protection for industrial consumer goods meant that prices of agricultural exports were between 44 and 71 percent lower (depending on the category of imports) relative to the prices of protected traded goods and were 33 to 35 percent lower relative to the prices of nontradable goods. In Peru, a 10 percent increase in tariffs on nonagricultural importables was found to decrease the prices of traded agricultural goods by 10 percent relative to the prices of those importables and by 5.6 to 6.6 percent relative to the prices of nontradables. Similar results have been obtained in countries as varied as Argentina, Chile, Colombia, Nigeria, and Zaire.

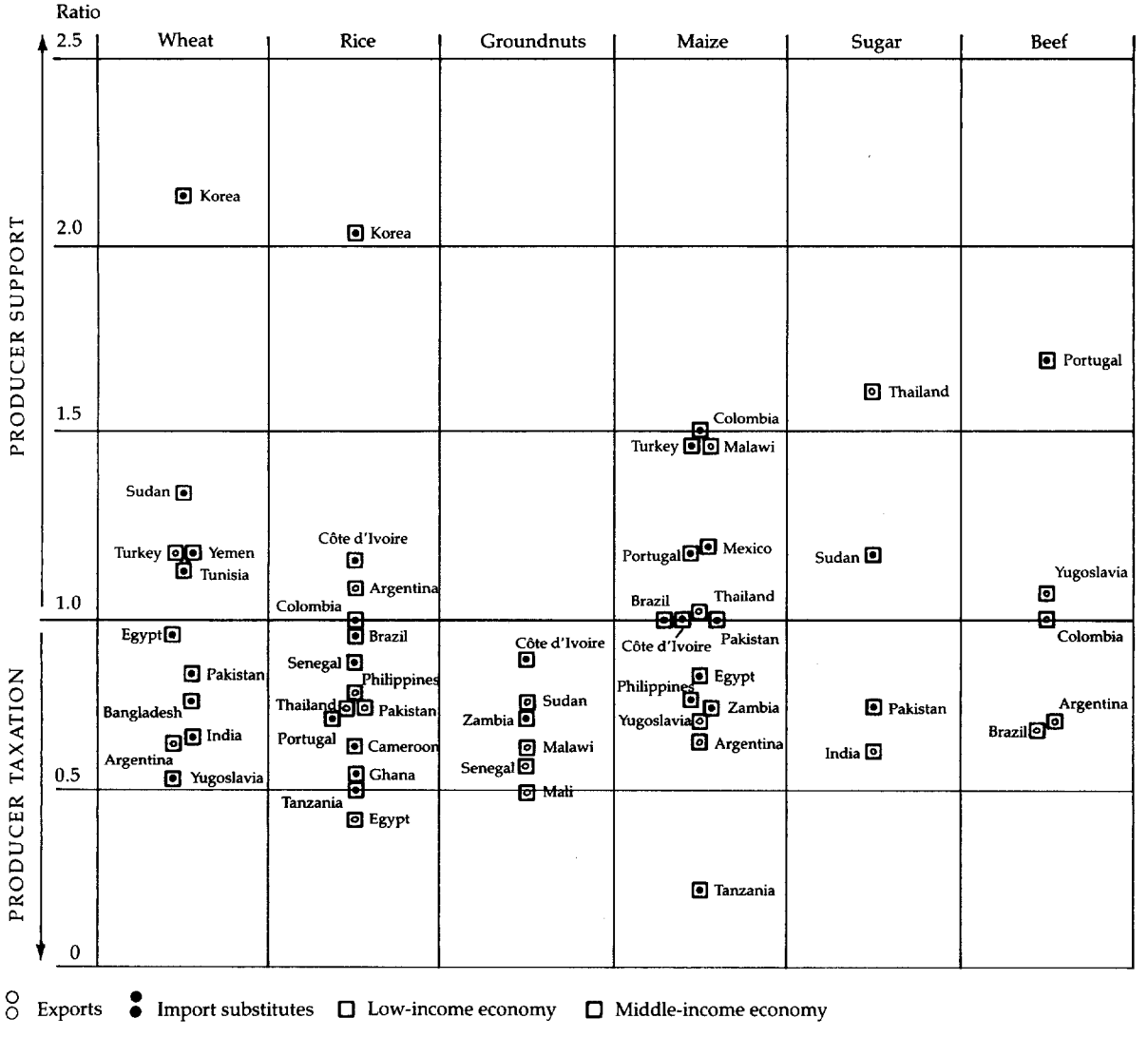
Policies on money supply and credit, public revenues and expenditures, foreign borrowing and investment, and exchange rate regimes have all been of critical importance during the 1970s and 1980s. When expansionary monetary and fiscal policies have led to higher inflation at home than abroad, governments have often failed to adjust exchange rates and have relied instead on increasing import protection by employing such devices as quotas, exchange controls, and licensing. In such circumstances, the currency becomes overvalued and the bias against agriculture becomes stronger because the increased protection usually accrues to industry. Typically, food imports are excluded from restrictive measures in order to keep urban food prices low: consequently, food imports are implicitly subsidized. Furthermore, in trying to reduce fiscal deficits, countries usually increase sectoral taxes on agricultural exports and curtail subsidy programs for agricultural inputs. As a result of both implicit and explicit taxation, agriculture—and the low-income groups that depend on it—tends to bear the brunt of the adjustment programs that ensue from destabilizing macroeconomic policies.

The impact on agriculture can be especially pronounced when import quotas are used, since changes in the domestic price of an imported commodity are then determined not by supply, which is fixed, but by the level of demand alone. Thus, by increasing overall demand, an expansionary fiscal policy would raise the domestic prices of goods whose imports are restricted. The net effect would be to reduce relative prices for agriculture and increase discrimination against it.

Capital inflows from abroad and sharp increases in the world prices of key exports also cause the real exchange rate to appreciate. But this by itself is not distortionary, although special sectoral measures may be needed to offset the effects on agriculture if the commodity boom is temporary and if factor movements out of agriculture are difficult to reverse. Typically, however, countries react to commodity booms by initiating expansionary monetary and fiscal policies, which leads to inflation and a greater appreciation of the real exchange rate than would occur simply because of the favorable change in the external terms of trade. The effects of this reaction continue even after the boom ends, because by then commitments to large investment programs or to large recurrent costs have already been made. This is what happened in Colombia (see Box 4.1).

SECTORAL POLICIES. Policies within the agricultural sector—such as trade duties, subsidies, and parastatal margins—can, of course, mitigate or exacerbate the implicit taxation caused by general economic policies. What are the levels of trade duties and subsidies in agriculture? Is agriculture actually taxed by sectoral policies, or is it subsidized? Figure 4.1 provides an overview of sectoral trade taxes and subsidies in various developing countries. These are measured as the difference between farmgate prices and border prices at official exchange rates, after adjustments for internal transport and marketing margins. This procedure is employed because, apart from conventional trade duties and subsidies, the use of quotas and

Figure 4.1 Ratio of farmgate prices to border prices for selected commodities of developing countries in the late 1970s and early 1980s

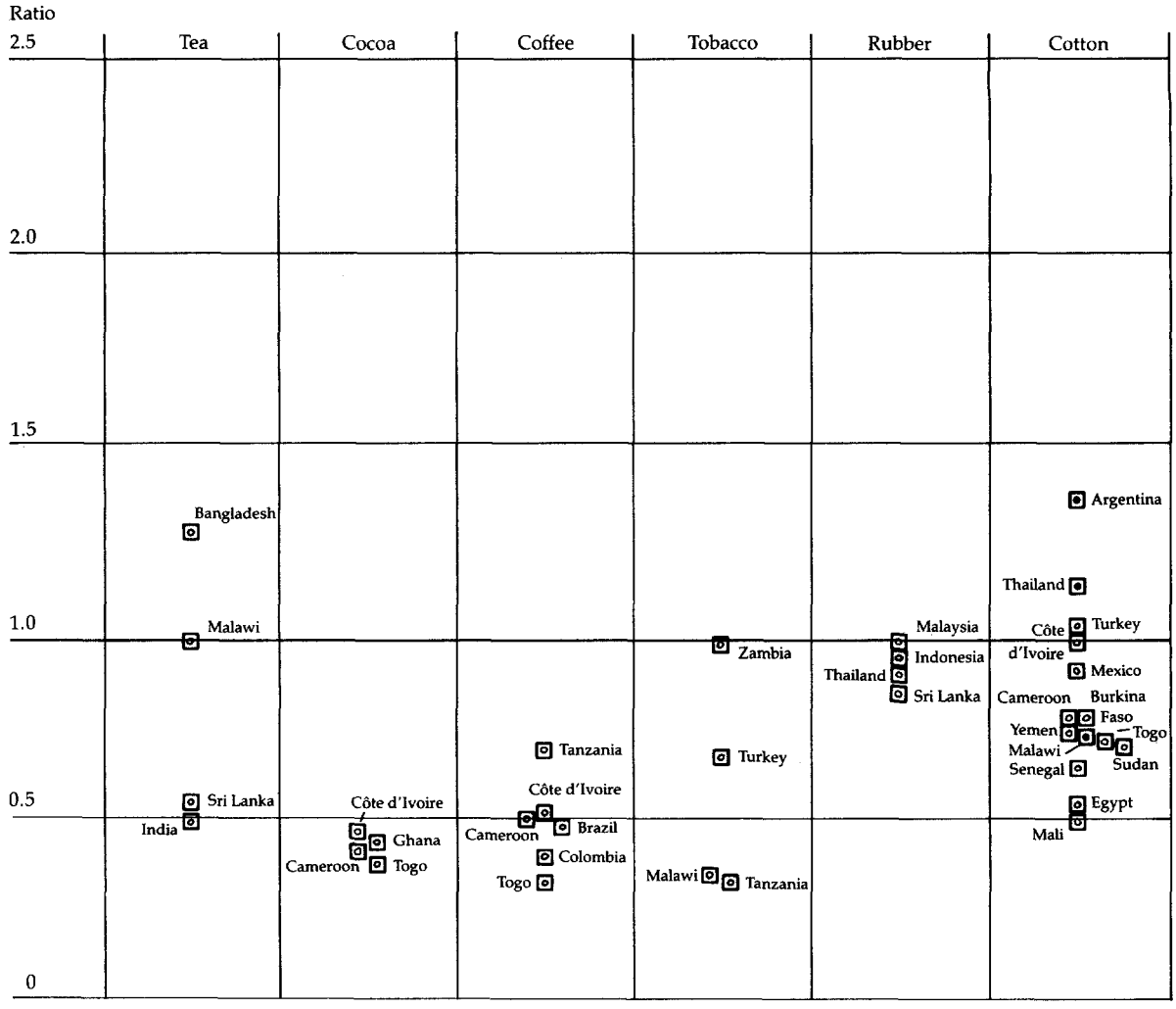


Note: Border prices are converted to domestic currency at official exchange rates.
Source: Binswanger and Scandizzo 1983; FAO data.

large parastatal marketing margins can contribute to the sectoral taxes and subsidies that farmers in effect face.

• *Export crops.* Figure 4.1 indicates that many countries tax export crops, sometimes at very high rates. In Togo, the farm price for coffee was a third of the border price. In Mali, cotton and groundnut farmers received half the border prices, and in Cameroon and Ghana cocoa producers received less than half.

The costs of high agricultural taxation are discussed later in this chapter. The first questions to ask are: How do governments tax agricultural output and exports, and why do they do it? Some taxation of export crops involves conventional border taxes or quotas, but frequently taxation is a result of the pricing policies pursued by marketing agencies in the public sector. This is especially so in Africa, where statutory monopolies, or marketing boards, have traditionally controlled export crops. Created in colonial times, marketing boards were almost always required to use the bulk of their funds for the benefit of the farming community. But most of them became de facto taxation



agencies—important public instruments for extracting resources from export agriculture in support of the postindependence drive to industrialize. High rates of export taxation, of the order of 50–75 percent, have not been unusual.

Marketing boards are also common in other regions. For example, commodity boards exist by statute for virtually all the major agricultural export crops in Jamaica, including sugar, bananas, citrus, coconuts, coffee, cocoa, and spices. While the boards were initially required only to assemble, package, and export these products, over the years their activities have expanded to cover many other functions, including price stabilization and, in some cases, processing. One study indicated that during the 1970s they in effect taxed producers at rates varying between 17 and 42 percent, depending on the commodity: the highest rates were on bananas and coffee. Moreover, domestic prices were usually at least as variable as export prices, and in some cases more so.

The primary reason for export taxes is, of course, to raise revenue for the use of either the marketing boards or the central government. But other rea-

Box 4.1 Coffee prices and macroeconomic policies in Colombia

Colombian agriculture has a strong trade orientation, based in large measure on the role of coffee. Agricultural exports account for about two-thirds of total exports, and the agricultural sector has generally been a net earner of foreign exchange. Fluctuations in coffee prices pose special problems for macroeconomic management because it is difficult to assess the duration of price increases and the degree of adjustment needed to deal with temporary changes in external factors.

Coffee prices rose sharply in the second half of the 1970s, and this contributed to an appreciation of the real exchange rate, which reduced the profitability of noncoffee exports compared with the profitability of nontraded goods and services. A number of interrelated factors supported this phenomenon:

- The increased supply of foreign exchange generated by the coffee boom, other things being equal, lowered the equilibrium real exchange rate during the boom.
- There was a spending effect. The coffee boom led to higher disposable real incomes, which were spent partly on noncoffee traded goods and partly on nontraded goods. Since the prices of noncoffee traded goods are determined mostly by their world prices and the official exchange rate, they fell relative to the prices of nontraded goods.
- The policy reaction aggravated the problem. Domestic credit and inflation increased significantly. The higher earnings from coffee increased foreign currency reserves, which were allowed to increase domestic money supply and credit, and trade barriers restricting imports were only partially relaxed. Thus, the real exchange rate appreciated further.

After coffee prices fell in the early 1980s, the growth in aggregate demand was maintained through higher public expenditures and foreign borrowing, thus sustaining the appreciation of the real exchange rate. From 1975 to 1984, domestic prices, measured in U.S. dollars at official exchange rates, rose by 100 percent—about twice the rate of external inflation. Growth in noncoffee exports and in noncoffee agricultural production fell in real terms in the first half of the 1980s.

As the balance of payments deteriorated in the early 1980s, and as it became more difficult to borrow abroad, the role of timely macroeconomic adjustments began to receive attention. A comprehensive macroeconomic policy package that addresses the issues of exchange rate appreciations and fiscal and monetary expansion was recently introduced to provide a sounder basis for the development of the external sector.

Since the introduction of these policy improvements, another surge in coffee prices has emerged, strengthening the country's balance of payments significantly. The challenge of sustaining monetary and price stability in the face of sharply changing coffee prices remains.

sons have also been important in practice. Developing countries have tended to impose export taxes to take advantage of the monopoly power they believe they have in world markets. Many developing countries have also sought to encourage agro-industries by taxing, or restricting by quota, the exports of the agricultural raw materials they use. Export taxes on cash crops have also been used to encourage the production of domestic food crops in order to attain self-sufficiency. As will be discussed later, export taxation for these purposes has been very costly in terms of national incomes and agricultural performance.

- *Agricultural import substitutes.* A few developing countries have protected agricultural import substitutes to promote self-sufficiency—especially in wheat and dairy and livestock products. In most cases, however, domestic producers of import substitutes are paid less than the import prices (adjusted for internal marketing costs). In an attempt to keep urban food prices low, governments often try to procure food at prices that are lower than those on world markets. Marketing agencies have been created for this purpose too, sometimes with statutory monopoly powers to ensure that farmers do not sell their products elsewhere. However, policing is difficult with food crops, and many farmers find more lucrative markets.

In Ethiopia, for example, a parastatal marketing agency controls about 30 percent of the total marketable surplus and almost 100 percent of the interregional grain trade from two of the three main grain-surplus areas. Its farmgate procurement prices have been far below the import parity prices; in 1985, for instance, the import parity prices (at the official exchange rate) for maize, sorghum, and wheat were respectively about 80 percent, 50 percent, and 45 percent above the farmgate prices. And, as shown in Figure 4.1, the maize procurement price in Tanzania was only a quarter of the border price. In Cameroon, Ghana, and Tanzania, rice producers were paid only about half the border price. This is by no means a phenomenon that occurs in sub-Saharan Africa alone.

The tendency to discriminate against domestic production relative to imports produced by foreign producers has been observed in Egypt, Mexico, and other developing countries with large urban food subsidy programs, although the degree of discrimination against domestic producers and the mechanisms used have varied. The costs of this discrimination are discussed later in this chapter.

It is often thought that if the border prices relevant to a country are depressed by policies abroad—for example, due to export subsidies—the country concerned should take countervailing measures to keep its domestic prices higher. The issue, however, is not how border prices are formed but what they are likely to be in the future. When countries can indefinitely obtain goods more cheaply from abroad than they can produce them, the usual arguments for open trade apply. Thus, if prevailing prices are expected to continue, countervailing actions will hurt rather than help a country. However, countervailing measures may be warranted if the average level of a border price is likely to increase sharply in the short run because of policy changes abroad. The practice of paying domestic producers of import substitutes and exportables less than border prices is, of course, precisely the opposite of countervailing measures.

SECTORAL POLICIES AND REAL EXCHANGE RATES. While sectoral pricing and trade policies frequently exacerbate the general economic bias against agriculture, their effects cannot be assessed in isolation from real exchange rate movements. Efforts to improve sectoral policies can easily be outweighed by appreciations in real exchange rates resulting from inappropriate macroeconomic policies. This is most easily seen in sub-Saharan Africa, where, for a variety of reasons, real exchange rates appreciated most sharply during the 1970s and early 1980s. For the sub-Saharan African countries as a group, real exchange rates appreciated by 31 percent between 1969–71 and 1981–83, as shown in Table 4.2. Exchange rate overvaluations were particularly large in Ghana, Nigeria, and Tanzania.

Since in sub-Saharan Africa—as in many other areas of the developing world—the cost of modern farm inputs imported or produced at home is only a small fraction of total farm costs, the importance of real exchange rate appreciations with regard to sectoral policies can be seen by looking at trends in farm output prices. Insofar as real labor costs increased as a result of the out-migration of labor from agriculture, the adverse effects of macroeconomic policies would have been greater than indicated by output price trends alone.

Table 4.2 Index of real exchange rates in selected African countries
(1969–71 = 100)

Country	*1973–75*	*1978–80*	*1981–83*
Cameroon	75	58	80
Côte d'Ivoire	81	56	74
Ethiopia	93	64	67
Ghana	89	23	8
Kenya	88	69	86
Malawi	94	85	94
Mali	68	50	66
Niger	80	56	74
Nigeria	76	43	41
Senegal	71	60	85
Sierra Leone	100	90	73
Sudan	76	58	74
Tanzania	85	69	51
Zambia	90	79	86
All sub-Saharan Africa	84	62	69

Note: The real exchange rate is defined as the official exchange rate deflated by the ratio of the domestic consumer price deflator to the U.S. consumption deflator. A fall in the index indicates exchange rate appreciation. Data are three-year averages.
Source: Kerr (background paper).

Suppose, for example, that in one year farmers received only half the border price at the official exchange rate—that is, the nominal protection coefficient was 0.5. Suppose also that the government eliminated this difference over a period of time, during which the exchange rate became overvalued by 50 percent because it was not adjusted in line with the excess of domestic inflation over inflation abroad. Even though farmers would seem better off nominally, in real terms they would actually be as badly off as they were originally.

The trends shown in Table 4.3 show how real farm incentives have been eroded over time despite apparent improvements in nominal terms. Using official exchange rates, one would infer that incentives for cereal production in Africa increased by 51 percent between 1969–71 and 1981–83, or, in other words, that domestic prices increased significantly more than border prices. But when border prices are calculated taking the real appreciations into account, the actual increase in incentives was only 9 percent. For export crops, incentives nominally increased by about 2 percent. However, they actually declined sharply—by 27 percent. Compared with the situation in 1969–71, by 1981–83 real incentives to export crops declined in all the countries shown in the table. This illustrates that agri-

Table 4.3 Index of nominal and real protection coefficients for cereals and export crops in selected African countries, 1972–83
(1969–71 = 100)

Country	Cereals				Export crops			
	1972–83		1981–83		1972–83		1981–83	
	Nominal index	Real index	Nominal index	Real index	Nominal index	Real index	Nominal index	Real index
Cameroon	129	90	140	108	83	61	95	75
Côte d'Ivoire	140	98	119	87	92	66	99	71
Ethiopia	73	55	73	49	88	71	101	66
Kenya	115	94	115	98	101	83	98	84
Malawi	85	79	106	100	102	94	106	97
Mali	128	79	177	122	101	83	98	70
Niger	170	119	225	166	82	59	113	84
Nigeria	126	66	160	66	108	60	149	63
Senegal	109	79	104	89	83	60	75	64
Sierra Leone	104	95	184	143	101	93	92	68
Sudan	174	119	229	164	90	63	105	75
Tanzania	127	88	188	95	86	62	103	52
Zambia	107	93	146	125	97	84	93	80
All sub-Saharan Africa	122	89	151	109	93	71	102	73

Note: The nominal index measures the change in the nominal protection coefficient with border prices converted into local currency at official exchange rates. The real index measures the change in the nominal protection coefficient with border prices converted into local currency at real exchange rates. Data for Ghana are not available.
Source: Kerr (background paper).

cultural reforms need to go hand in hand with general economic reforms.

Counting the costs

There are many indications that the costs of discriminating against agriculture—either implicitly through macroeconomic policies or explicitly through sectoral policies—have been large. An important reason why this is so is that, contrary to a long-held belief, farmers in developing countries—as in industrial countries—respond strongly to prices. The crops they grow, the amounts they produce, and the technologies they adopt depend greatly on the policy environment.

There is a large body of evidence that indicates that the supply response in developing countries is not low. A sample of the numerous estimates made by researchers of supply responses for individual crops is shown in Table 4.4. The lower end of the range shows short-term supply responses, the upper end long-term responses. Even in the short term, the supply responses are significant, considering the high level of taxation to which farmers have often been subjected. Supply responses are widely believed to be especially low in Africa. In fact, however, many studies suggest that they can be as high as they are elsewhere. The high supply response of African farmers, who have to make do with a poor infrastructure and imperfect markets, is evident in Niger (see Box 4.2).

Empirical work has indicated that the supply response for all crops taken together is lower than the responses for individual crops. This is partly to be expected: If a government taxes only one crop, resources need not be withdrawn from farming altogether. They can be shifted to other crops so that total farm output does not fall by as much as the

Table 4.4 Summary of output responses to price changes

Crop	Percentage change in output with a 10 percent increase in price	
	Africa	Other developing countries
Wheat	3.1–6.5	1.0–10.0
Maize	2.3–24.3	1.0–3.0
Sorghum	1.0–7.0	1.0–3.6
Groundnuts	2.4–16.2	1.0–40.5
Cotton	2.3–6.7	1.0–16.2
Tobacco	4.8–8.2	0.5–10.0
Cocoa	1.5–18.0	1.2–9.5
Coffee	1.4–15.5	0.8–10.0
Rubber	1.4–9.4	0.4–4.0
Palm oil	2.0–8.1	..

Source: Askari and Cummings 1976; Scandizzo and Bruce 1980.

Box 4.2 Flexible markets in Niger

Farmers in low-income economies are commonly assumed to be inflexible, slow to respond to prices, and sluggish in adapting to changing circumstances. This assumption is wrong or greatly exaggerated. Recent developments in the agricultural sector in Niger tell a story, not of passivity and slow response to change, but, rather, of quick adaptation and adjustment to new economic realities.

Niger is one of the poorest countries in the world. In the 1970s, farmers relied primarily on groundnuts for cash income; cotton and livestock were secondary sources of income. In recent years, farm households have begun to diversify their sources of income. Studies indicate that nonfarm earnings now account for more than 20 percent of total household income. Sales of animals, traditionally the most important source of noncrop income, account for an additional 30 percent. So, half of all agricultural income now comes from sources other than crop production. A census in 1980 revealed that approximately 6 percent of rural Nigerien men are wage earners. An additional 12 percent have some occupation outside agriculture; for men between the ages of thirty-five and forty-five, the figure is 20 percent. Ninety percent of villages send migrants to work in Nigeria or other countries farther south during the dry season.

In addition to diversifying out of crop agriculture, Niger's farmers have changed their farming patterns. In the 1970s, prices of millet, sorghum, and cowpeas rose faster than those of groundnuts. At the same time, groundnut yields were declining, and, after the 1973 drought, farmers wanted to rebuild their food stocks. All this encouraged farmers to sow more land to food crops, especially sorghum and cowpeas. The most dramatic result was that cowpeas overtook groundnuts as the country's main agricultural export. Production of cowpeas grew by more than 250 percent during the 1970s, while the area planted expanded by almost 70 percent. Earnings from cowpeas have begun to account for a measurable part of farm revenues—4 percent in all, but, according to some surveys, as much as 12 percent for smaller farmers in main producing areas. Meanwhile, groundnut sales have shrunk to almost nothing.

Cowpeas have a number of advantages over groundnuts. They can be grown in a variety of soils and allow farmers to adopt flexible cropping patterns. They are more resistant to drought. A large and accessible market exists in Nigeria, whereas groundnut's export markets are mainly in Europe. Cowpeas are traded almost exclusively on parallel markets, where prices have frequently been twice as high as the official prices paid by SONARA, the state marketing agency. It is hard to know the volume of "unofficial" cowpea exports to Nigeria, but annual production is believed to be 250,000–300,000 tons, while legal exports have never amounted to more than 30,000–40,000 tons.

Important points are illustrated by the example of Niger. It shows how buoyant open markets can be, even in unlikely places. The growth of cowpeas took place almost entirely through parallel markets and in the face of public policies that were not encouraging. The official price and marketing structure was bypassed. And it shows that change can be extraordinarily rapid. In a decade or less, one main cash crop disappeared and was replaced by another. All of this happened primarily in response to market signals, despite poor infrastructure, embryonic market information, and generally imperfect market conditions.

output of the crop taxed. But estimates of aggregate farm output responses have typically been of a short-term nature and have failed to reflect the fact that changes in prices have a long-term effect on the intersectoral flow of resources. When such effects are taken into account, the aggregate supply becomes price responsive as well.

Discrimination against agriculture on a sustained basis not only reallocates resources within agriculture but also draws them out of it. As labor and capital move out and technical progress slows, the long-term losses can be large:

- The International Food Policy Research Institute (IFPRI) studied the evolution of the Argentine and Chilean economies and the effects of pricing and exchange rate policies on agriculture. The study showed that, if agricultural prices in Argentina between 1950 and 1972 had been 10 percent higher than they in fact were (when the government was taxing farmers heavily), total agricultural output would have gradually increased to a level approximately 9 percent higher, on an annual basis, than it actually was over the period. The increase in production would have been achieved largely because more capital would have been attracted into agriculture and technical improvements would have been made. Box 4.3 on Argentina discusses how inappropriate macroeconomic and sectoral policies led to a large reduction in agricultural output. A similar simulation for the Chilean economy during the period 1960–82 indicated an even greater supply response: the level of out-

put would have eventually become 20 percent higher each year than otherwise in response to a 10 percent sustained increase in agricultural prices. Sustained taxation of farming can thus lower the returns to investment, discourage technical progress, and encourage farmers to leave the land.

• Evidence about the long-term effects of price changes on farming can also be obtained by exam-

Box 4.3 Trade policies and agricultural performance: the case of Argentina

Argentina has ideal farming conditions and is one of the largest grain exporters in the world. It has had a long history of agricultural growth. Between 1965 and 1983, however, agricultural growth averaged only 0.8 percent a year, compared with 1.9 percent a year during 1950–64 and about 2.6 percent before World War II. Agriculture's recent poor performance reflected poor incentives. The internal terms of trade were deliberately turned against the agricultural sector through a combination of export taxes, tariffs, restrictions on imports of industrial goods, and exchange controls which led to an overvalued currency. Argentina's policies grew out of a perception that its exports, which were primarily agricultural, were facing declining real prices on world markets and therefore Argentina needed to diversify its economy by encouraging industry.

Moreover, in the 1950s and 1960s, the notion that agricultural output did not respond significantly to price changes was an essential part of the debate on growth, inflation, and distribution in the Argentine economy. Policymakers argued that taxing agriculture to support industries that made import substitutes would not result in big losses in farm output; similarly, they thought that increasing agricultural prices by reducing export taxes or by devaluing the currency would increase the budget deficit, accelerate inflation, and penalize poor consumers without significantly affecting agricultural supply. Indeed, inflation itself was considered to be structural, that is, a reflection of the food or foreign exchange shortages that resulted when industrialization pushed up income and increased domestic demand for food. These views have been changing since the 1960s, and, by now, agricultural supply responses have been shown to be strong in Argentina.

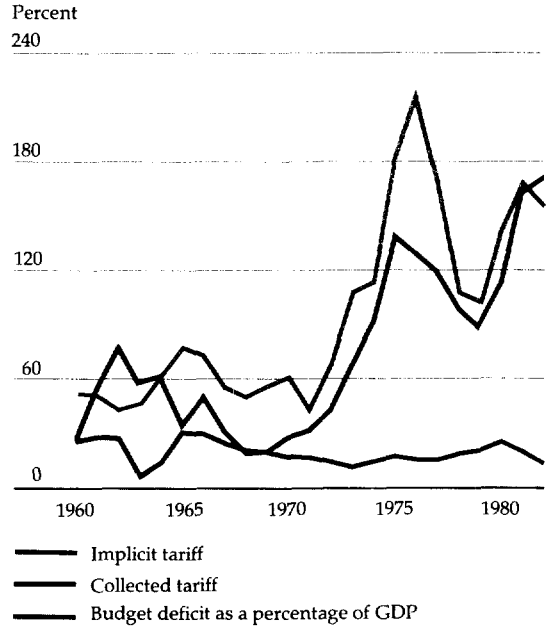
A recent study of the Argentine economy examined the combined impact of exchange rate, fiscal, and commercial policies on the agricultural sector. Besides estimating the level of taxation on agriculture created by the above policies, it also provided insights into the interrelationships among various macroeconomic policies. For example, it showed that, since physical controls on imports were the primary instruments used to protect industry, fiscal policy strongly influenced the degree to which Argentina's trade policy adversely affected agriculture. While the restrictions remained for the most part constant between 1960 and 1983, domestic prices for protected imports deviated widely from world prices when macroeconomic policies changed. During periods of high government spending, demand for imports rose and domestic prices for protected imports jumped sharply, turning the internal terms of trade against agriculture (see Box figure 4.3).

By simulating what would have happened in the absence of these policies, the study indicated that:

• Real prices of all agricultural products would have been higher by about 38 percent a year on average during 1960–83. These prices were depressed not only because of import control and public spending policies, as described above, but also because of heavy taxation of agricultural exports. These exports, which are an important component of the sector, were taxed at an average annual rate of about 44 percent during the period.

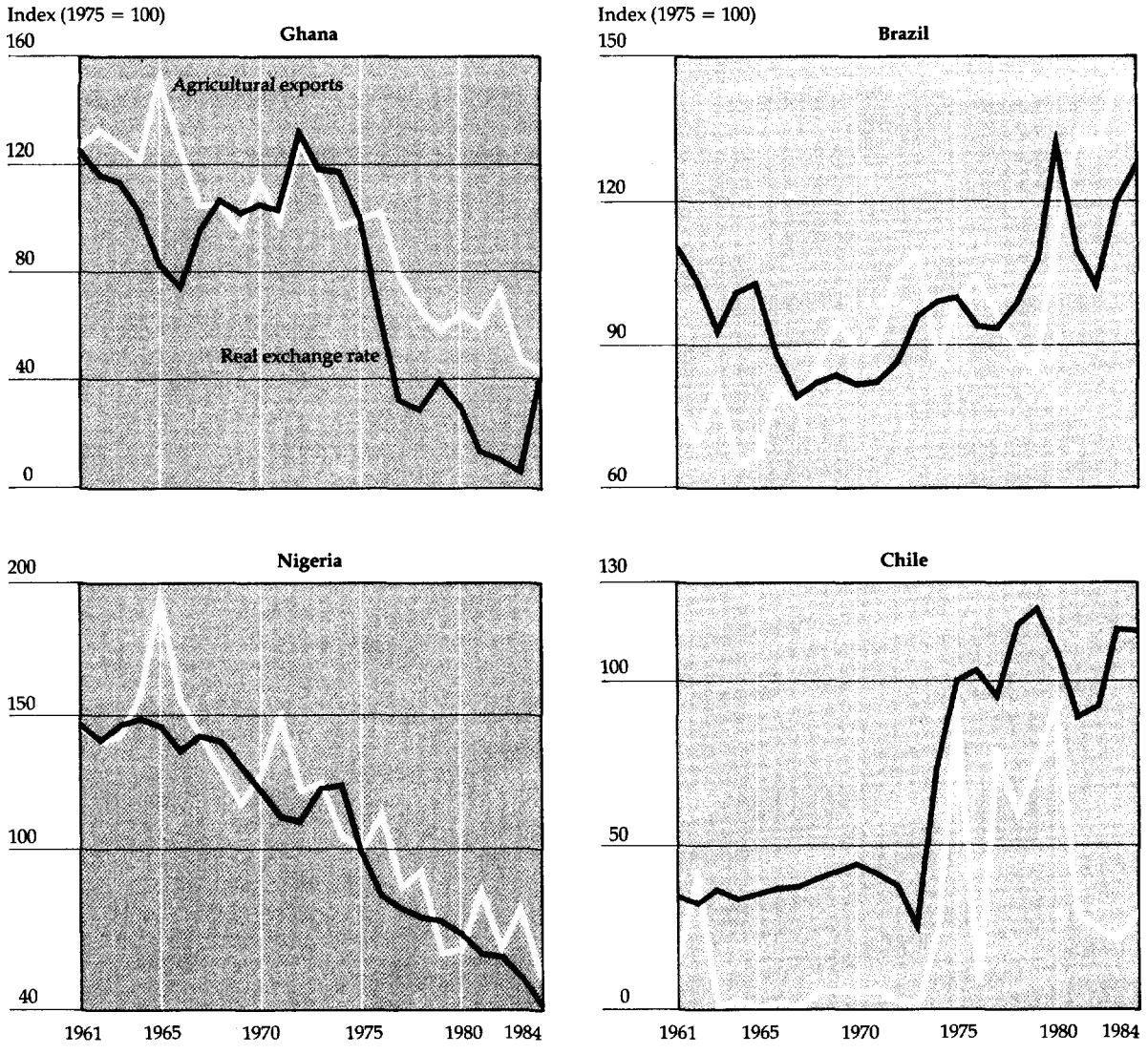
• The annual value of agricultural output would have become 33 percent higher by 1983 had the agricultural prices not been depressed by 38 percent as a result of the sectoral and macroeconomic policies.

Box figure 4.3 Implicit and collected tariff rates and budget deficits in Argentina, 1960–82



Note: An implicit tariff of 100 percent indicates that the domestic price is double the corresponding international price.
Source: Cavallo (background paper).

Figure 4.2 Indices of real exchange rates and agricultural exports in Ghana, Nigeria, Brazil, and Chile, 1961–84



ining what happened when the real exchange rate changed sharply and affected the real prices of farm goods received by producers. Two countries whose real exchange rates appreciated sharply—Ghana and Nigeria—can be compared with two countries whose real exchange rates depreciated—Brazil and Chile. Figure 4.2 shows a close connection between changes in the real exchange rates in these countries and the level of their agricultural exports. Detailed econometric studies show this is true more widely. On average, a percentage point fall in the real exchange rate reduces agricultural exports by 0.6–0.8 percentage point in all developing countries and by more than one percentage point in sub-Saharan Africa. The results for Africa not only confirm the fact that supply responses are high in that region, but also show that exports are sensitive to exchange rate changes when there is the chance to sell on parallel markets. Correlations between real exchange rate movements and agricultural output have also been similarly close in many cases. The effects of real exchange rate movements on agriculture in Nigeria and Indonesia are discussed in Box 4.4, which compares the countries' different reactions to the oil booms of the 1970s.

• The emergence of parallel markets, most significantly in Africa, indicates that the taxes which marketing agencies have tried to impose and the large exchange rate overvaluations have gone well beyond what is enforceable. The main loser is the government itself. It loses tax revenues when farmers sell export crops unofficially, and it may end up worse off than it would have been had taxes been lower and the real exchange rate appropriate. Sierra Leone suffered large foreign exchange losses because exports of coffee, cocoa, palm kernels, and rice were smuggled out through

Box 4.4 Oil and agriculture: Nigeria and Indonesia

The oil boom of the 1970s and early 1980s proved a blessing and a curse for many oil-exporting countries. Oil revenues raised the standard of living, widened job opportunities, and increased the policy options available to governments. But they also altered the structure of incentives in the economy, raised expectations, and produced rapid and often destabilizing changes. Agriculture, especially, was affected by these changes.

Oil-exporting countries commonly experienced declines in the rate of growth of their agricultural sectors. Higher incomes led to an increase in the price of nontradable goods at the expense of tradable goods such as crops. Farmers abandoned the land for more lucrative employment in the booming construction industry. The ability to pay for larger imports of food and other agricultural products, which were then sold at subsidized prices, lowered the relative profitability of agriculture. The force of these changing incentives has been strongly influenced by government policies and the structure of the economy. Indonesia and Nigeria, two middle-income economies that had more than 40 percent of GDP originating in agriculture before the oil price increase of 1973, provide a revealing contrast.

In Nigeria, the oil boom led to a severe disruption of the agricultural economy and a large exodus to the cities. Between 1970 and 1982, annual production of Nigeria's principal cash crops fell sharply: cocoa by 43 percent, rubber by 29 percent, cotton by 65 percent, and groundnuts by 64 percent. The share of agricultural imports in total imports increased from about 3 percent in the late 1960s to about 7 percent in the early 1980s. Indonesia, all but unique among the oil-exporting developing countries with large populations, succeeded in avoiding serious disruption to its agriculture. Though agricultural growth slowed in the mid-1970s, by the late 1970s it had recovered to previous levels (see Box table 4.4). Rice production grew by 4.2 percent a year from 1968 to 1978 and by 6.7 percent from 1978 to 1984, largely because of rapid increases in rice yields. The share of agricultural imports in total imports remained unchanged at about 1.0 percent. Indonesia increased its agricultural exports both as a proportion of developing countries' agricultural exports and as a proportion of world agricultural exports. The rates of increase were 2.0 percent a year and 0.5 percent a year, respectively, between 1965 and 1983. Nigeria's corresponding export market shares declined at the rate of 5.7 percent a year and 7.1 percent a year, respectively.

Several policy differences between Nigeria and Indonesia explain these divergent results. The real exchange rate appreciated in both Nigeria and Indonesia by about 30 percent between 1970–72 and 1974–78. Thereafter, Indonesia kept its real exchange rate steady. It tightened its monetary and fiscal policies and between November 1978 and March 1983 devalued the rupiah by more than 50 percent against the dollar. In contrast, Nigeria resisted any devaluation of the naira, despite rapid appreciation of the real exchange rate. Nigeria also borrowed heavily on the basis of future oil earnings. By 1982 the real exchange rate was more than double its value in 1970–72.

The two countries also differed in their public spending on agriculture. The bulk of Nigeria's increased public expenditure was allocated to primary education, transport, and construction. Indonesia distributed spending more equally among physical infrastructure, education, capital-intensive industry, and agricultural development, especially in rice.

In recent years, Nigeria has made efforts to increase incentives and boost investment in agricultural infrastructure and extension services. Yet output has continued to stagnate. Reversing agriculture's long decline will require a sustained improvement in real farm prices and better exchange rates as well as continued and improved agricultural support programs.

Box table 4.4 Real exchange rate and agricultural performance in Nigeria and Indonesia, selected years, 1965–83

A. Index of real exchange rate

Year	*Nigeria*	*Indonesia*
1970–72	100.0	100.0
1974–78	76.3	74.7
1982–83	47.8	71.3

B. Growth of agriculture
(average annual percentage change)

	Agricultural output		*Agricultural exports*	
Year	*Nigeria*	*Indonesia*	*Nigeria*	*Indonesia*
1965–73	2.8	4.8	−4.0	1.9
1974–78	−2.5	2.8	−4.2	5.3
1973–83	−1.9	3.7	−7.9	3.1

Source: Pinto (background paper).

neighboring Liberia. The experience with parallel markets also reflects the changes that farmers make to their pattern of production when crops are discriminated against on official markets. In Tanzania, higher food prices on the parallel market resulted in a decline in the production of export crops (such as cotton, tobacco, and pyrethrum) when farmers switched to growing maize instead. The losses in foreign exchange contributed to further overvaluation of the currency, which depressed export production still more (see Box 4.5).

THE COSTS OF MISJUDGING MONOPOLY POWER AND COMPARATIVE ADVANTAGE. Perhaps the most striking evidence of the cost of export taxation can be found in the reduced shares of many developing countries in international trade. Many developing countries tax exports of raw materials and beverages in the hope of benefiting from their perceived monopoly power in tradè. The less responsive the world demand is to prices and the higher a country's share in world markets, the greater the country's monopoly power. Quite a few developing countries have had large enough market shares to exercise some monopoly power. In the early 1960s, Burma and Thailand each accounted for about one-fifth of world exports in rice; India and Sri Lanka each accounted for about one-third of world tea exports; Nigeria and Zaire each accounted for about one-quarter of world exports of palm oil; Ghana accounted for two-fifths of world cocoa exports; Bangladesh had about four-fifths of world exports of jute; and Indonesia and Malaysia accounted for 30 and 40 percent of world exports of rubber, respectively. All these countries, as well as Brazil (coffee) and Egypt (long-staple cotton), have tried to keep world prices high by restricting supply.

But the gains from exploiting monopoly power have usually been limited because foreign consumers have found alternative supplies or substitutes and because domestic producers have had lower incentives to invest in new technologies. Countries that instituted heavy export taxes have seen their market shares usurped by others with more favorable policies toward producers. Ghana and Nigeria have lost world market shares in cocoa (see Table 4.5). In the early 1960s, Nigeria and Zaire exported more palm oil than the main Asian producers; by the early 1980s the Asian exporters had captured more than 90 percent of the world market. Egypt's share of the world cotton market in the early 1960s had been cut in half by the early 1980s. Sri Lanka has seen its share of the world tea market fall from one-third in the early 1960s to one-fifth in the early 1980s. In contrast, Kenya, which encouraged tea producers, has seen its share increase from less than 3 percent to more than 9 percent during the same period. Box 4.6 discusses these trends.

Because prices of food and raw materials tend to decline in real terms over the very long term, many believe that investment in agriculture—especially in primary products—is a losing proposition and

Table 4.5 Growth in output and exports, and the export market shares of cocoa and palm oil in selected developing countries, 1961–84

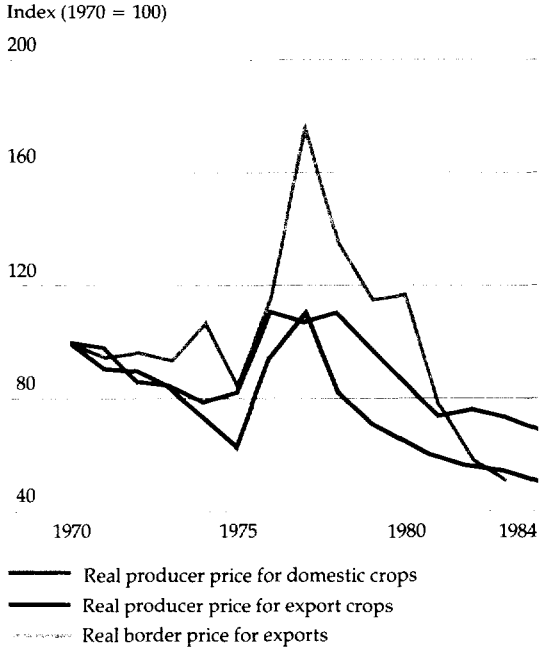
Commodity and country	*Average annual percentage change in output, 1961–84*	*Average annual percentage change in exports, 1961–84*	*Export market shares*	
			1961–63	*1982–84*
Cocoa				
Africa	0.1	−0.6	80.0	64.1
Cameroon	1.5	0.5	6.8	6.9
Côte d'Ivoire	7.3	6.0	9.3	26.3
Ghana	−3.7	−4.2	40.1	14.4
Nigeria	−2.0	−1.9	18.0	11.2
Latin America	3.2	0.9	16.7	18.5
Brazil	4.5	2.7	7.3	10.9
Ecuador	2.5	2.2	3.2	2.6
Palm oil				
Africa	1.8	−6.4	55.8	1.9
Nigeria	1.4	−23.6	23.3	0.2
Zaire	−1.8	−15.5	25.1	0.1
Asia	15.0	14.8	41.8	95.0
Indonesia	9.7	6.2	18.4	8.2
Malaysia	19.0	18.0	17.9	70.6

Box 4.5 Agricultural prices and marketing in Tanzania

In Tanzania, the government controls most aspects of agricultural marketing. Marketing cooperatives responsible to national crop marketing boards began to take over from private traders during the 1960s. Between 1973 and 1976, ten state agencies were put in charge of buying, processing, and marketing twenty-seven widely grown crops and fifteen minor ones. The marketed surplus of most of these crops could be sold through state channels only. The government fixed the producer prices before the start of each season. Prices did not take into account differences in transport and were often the same throughout the country.

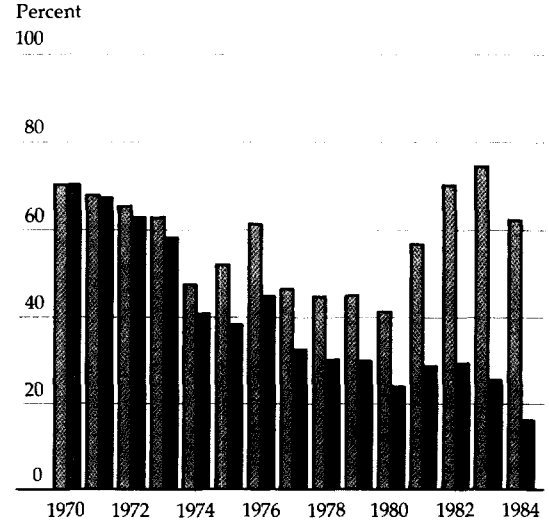
Some of the effects can be seen in Box figure 4.5A. Real prices for farmers fluctuated as fixed nominal prices were adjusted in unpredictable jumps every few years; thus, not even the aim of stabilizing prices was achieved. But, worse for farmers, average real producer prices declined steeply between 1970 and 1975, recovered somewhat in 1975–78, and have continued to fall ever since. By 1984 the weighted average of official producer prices was 46 percent below its 1970 level in real terms; prices for export crops were almost half their 1970 levels, even though the weighted average of world prices for Tanzania's crops at official exchange rates was 17 percent higher in real terms in 1980 than it had been in 1970.

Box figure 4.5A Agricultural prices in Tanzania, 1970–84



Source: Ellis (background paper).

Box figure 4.5B Ratios of producer prices to border prices in Tanzania, 1970–84



Note: Prices are a weighted average of ten export crops.
Source: Ellis (background paper).

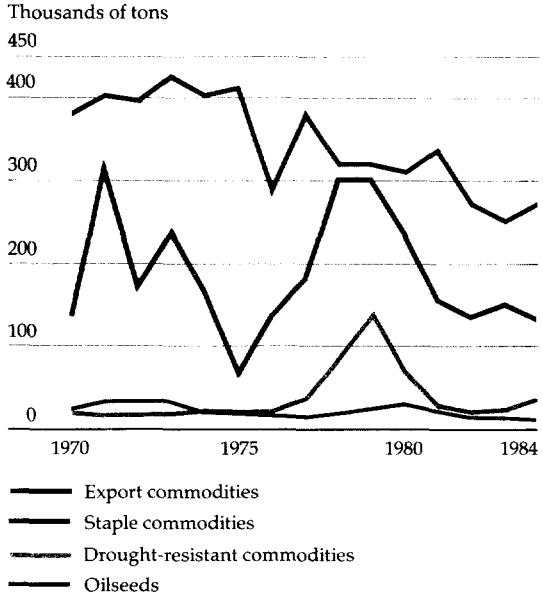
Rising export taxes and increased marketing costs reduced the farmers' share of the final sales value of export crops from 70 percent to 41 percent in 1980, although it has since recovered (see Box figure 4.5B). But the bias against export crops has been much more severe than is indicated when measured at official exchange rates. Correcting for the overvaluation of the currency during this period, the bias was much stronger, as is also shown in Box figure 4.5B. In reality, the bias against exports was even greater, because producers of food crops could sell their output on parallel markets, where prices were higher than official levels, but producers of export crops could sell only to the government.

The output of some export crops, notably cashews, cotton, and pyrethrum, fell drastically in the 1970s. Ambitious development programs for tea and tobacco

failed to reach their targets. Coffee production also stagnated, because farmers had little incentive to replace old trees. By 1984 the tonnage of export crops marketed by the marketing boards was 30 percent less than it had been in 1970.

At first sight, it seems the boards had more success with domestic staples. In 1978–79, the marketing channels sold more than twice as much staple grains (particularly maize) as they had in 1970 (see Box figure 4.5C). This reflected the good harvests that followed droughts in 1974–75 and an increase in real producer prices as world market prices rose (though the absolute level of the producer price for maize was still less than one-third of the import price). Official marketing of drought-resistant crops (cassava, sorghum, and millet) in 1979 was more than eight times the 1970 level, and for oilseeds (groundnuts, sesame, sunflower, and castor) the level in 1980 was some 30 percent greater than in 1970. But problems emerged. As real producer prices for domestic crops declined sharply, the official marketing boards became increasingly dependent on imports; farmers shifted to parallel markets, where prices, though unstable, were many times higher than official prices (see Box table 4.5). By 1984 the amount of maize marketed through official channels was less than one-third of its 1979 peak; official channels in 1984 handled less than one-third of the average annual amount of rice they had sold in the 1970s. Considerable diversion to parallel markets has also occurred with the drought-resistant and oilseed crops. Only in the one major crop in Tanzania where the producer price has generally been maintained above the import price—wheat—has state marketing been more stable.

Box figure 4.5C Marketed output of commodity groups in Tanzania, 1970–84



Source: Ellis (background paper).

Box table 4.5 Official and unofficial prices for selected crops in thirteen villages in Tanzania, 1979–81

(Tanzanian shillings per kilogram)

	Official price		*Parallel price*	
Crop	*1979–80*	*1980–81*	*1979–80*	*1980–81*
Maize	1.00	1.00	3.08	4.98
Paddy rice	1.50	1.75	2.31	4.23
Cassava	0.65	0.65	1.99	2.90
Sorghum	1.00	1.00	2.96	4.68
Millet	2.00	1.50	4.73	6.95

Source: Raswant (background paper).

In recent years Tanzania has tried to reform its system by relying more on village cooperatives. People may now transport up to 500 kilograms (rather than 30 kilograms) of grain without a permit; anyone with foreign exchange can use it to import goods; above all, the state marketing boards will control the prices of only eighteen main crops, not the forty or more regulated a few years ago. Controls on the retail price of maize flour, the main food staple, were lifted in 1984.

Relaxing controls on grain marketing may have been the single most important factor contributing to the recent increases in grain supplies and to the 50 percent real fall in food prices in 1985, but the success of Tanzania's reforms is far from ensured. Much will depend on whether the cooperatives can be set up quickly and whether they will be allowed to respond to farmers' demands. Few improvements in agricultural production are likely if the cooperatives turn out to be merely another form of monopoly. Much depends, too, on the flexibility of marketing arrangements for major export crops; on whether the official prices are recognized for what they tend to be in practice—minimum floor prices rather than fixed procurement prices; on whether the high costs of public sector marketing can be reduced; and, finally, on whether the government can reverse the substantial appreciation of the currency that occurred between 1979 and 1984.

Box 4.6 Export taxation and monopoly power

Countries with a significant share of an export market can affect world prices, at least for a short period of time. But attempts to tax foreigners may easily turn into excessive taxation of domestic farmers. The result is often stagnation or decline in export crops.

Cocoa in Ghana

Cocoa pricing policies in Ghana provide one example. Since 1950, the Cocoa Marketing Board has had a monopoly on buying, transporting, and exporting cocoa. The board used its monopoly power to raise significant tax revenue from export sales. At the same time, the government kept the value of the currency high: in 1979 the real exchange rate was estimated to have been 347 percent higher than it had been in 1972. The combined effect was to raise the effective export duty from a high 54.3 percent in the last half of the 1960s to 88.9 percent in the last half of the 1970s. Producer prices in Ghana were far below levels in competing West African countries (see Box table 4.6A). Ghana's share of export markets slumped from 40 percent in 1961–63 to 18 percent in 1980–82; Togo's market share grew slightly; that of Côte d'Ivoire rose from 9 percent in 1961–63 to 29 percent in 1980–82. This was greater than the increase in its exportable surplus: the higher prices in Côte d'Ivoire led to extensive smuggling of Ghanaian cocoa.

Box table 4.6A Relative price incentives for cocoa farmers in Ghana, Togo, and Côte d'Ivoire, 1965–82

Year	*Ratio of Ghana price to Togo price*	*Ratio of Ghana price to Côte d'Ivoire price*
1965	0.97	0.97
1970	0.56	0.60
1975	0.74	0.48
1980	0.23	0.18
1981	0.36	0.26
1982	0.40	0.30

Tea in Sri Lanka

Sri Lanka had considerable scope for influencing world prices for tea in the early 1960s. In 1961–63 it accounted for 33 percent of world tea exports, and Sri Lankan tea had a long-established niche in the market. Kenya then accounted for only 2.6 percent of world exports. While other factors have also been important, the two countries followed very divergent pricing policies. In Sri Lanka, average tax rates exceeded 50 percent in the late 1970s; they have averaged 35 percent over the past decade. In Kenya, taxation was much more moderate. Box table 4.6B compares tax rates in 1985 at a range of world prices. Sri Lanka's tax captures most of the surplus above an estimated cost of production. In contrast, most of the returns remain with the producer in Kenya. When tea costs $2.40 a kilogram, tax rates in Sri Lanka are ten times higher than in Kenya. At $3.60 a kilogram, they are still more than three times as high. By 1980–82, Sri Lanka's share of world markets had fallen to 19 percent while Kenya's share had more than tripled to 9 percent.

Box table 4.6B Tax rates on tea in Kenya and Sri Lanka, 1985
(percent)

F.o.b. price (dollars per kilogram)	*Kenya*		*Sri Lanka*	
	Average tax rate	*Marginal tax rate*	*Average tax rate*	*Marginal tax rate*
1.20	0.00	0	22.4	0
1.80	2.83	10	14.9	0
2.40	2.59	15	27.7	50
3.00	8.17	20	32.2	50
3.60	10.66	25	35.2	50
4.20	13.10	30	37.3	50
4.80	14.92	25	38.9	50

that planners should shift their attention elsewhere. This view is misleading for several reasons. First, long-term declines in real commodity prices have coexisted with, indeed have been partially caused by, technical progress in developing countries. Countries that have promoted technical progress—for example, Thailand in rubber and Malaysia in palm oil—continue to find specialization in primary commodity exports profitable. Second, if despite technical progress, economic rates of return to investments in agricultural commodities gradually fall to unacceptable levels, the economies concerned should at that time shift resources elsewhere. Such a shift should occur naturally, with market prices signaling the economic merits or demerits of further investments. It is inappropriate and self-defeating for policymakers to force the process by imposing excessive taxes on exports or by other means.

THE COSTS OF PROMOTING AGRO-INDUSTRIES. Developing countries sometimes subsidize agro-industrial exports to offset escalating tariffs in industrial countries (see Chapter 6). Such subsidies may be given directly, in the form of subsidized credit to processors, or indirectly, by restraining

domestic raw material costs through export quotas or taxes. Systematic taxation of raw materials to ensure the financial viability of processing industries has been common in many countries, including Ghana and Tanzania. Although the taxation of raw material exports may reduce the financial costs of processing, the true costs of subsidies are borne by the developing countries themselves.

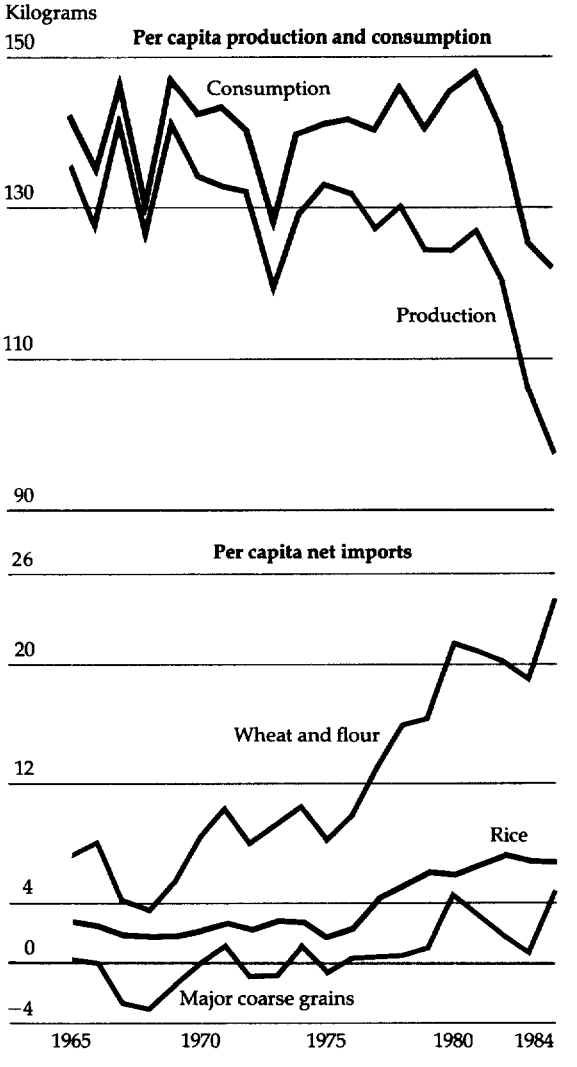
The growth of the soybean processing industry in Brazil illustrates how subsidies for agroindustries can become counterproductive. The expansion of soybean output in Brazil is a remarkable story: starting from a very small base in the late 1960s, soybean production expanded so rapidly that by the early 1980s Brazil was producing nearly 19 percent of world output. The expansion of soybean processing was even more rapid. Prior to the 1970s, soybean processing was composed of many small and medium-size plants; the total processing capacity was 800,000 tons. By 1980, processing capacity had increased to 20 million tons, or about 160 percent of domestic soybean production. Brazil began importing soybeans to process at home. In 1984, more than 63 percent of soybean production was exported, of which only 6 percent was in raw form.

This growth in processing capacity was induced by a policy, initiated in the early 1970s, of providing large credit subsidies, imposing controls and taxes on raw soybean exports, prohibiting imports of soybean oil and meal, and giving export subsidies to processors. During the period 1976 to 1984, the margins between the border prices of oil and meal and raw soybeans were insufficient to cover processing costs. If raw soybean inputs are valued at what they could have earned in the world market, processing actually resulted in foreign exchange losses. As a result of the encouragement given by the government to the processing industry, the economy lost about $1.7 billion between 1976 and 1984. Without the direct and indirect subsidies, the growth of processing capacity would have been smaller, because the true costs of processing and the risks of adverse world price movements would have been perceived by the private sector.

THE COSTS OF SELF-SUFFICIENCY. Developing countries proclaim self-sufficiency in food as a crucial national objective. Various means can be used to attain it—for example, import barriers, public investments to support food production, and taxation of crops that compete with food production. All of these means have been used, although, as mentioned earlier, systematic protection of import substitutes has not been common. What has been much more common is discrimination against domestic producers through low procurement prices and through macroeconomic policies. The strong bias against agriculture has increased sub-Saharan Africa's dependence on imports of food, particularly wheat and rice (Figure 4.3).

Paradoxically, Africa's food problems are often ascribed to an overemphasis on nonfood crops. But data for the periods 1960–70 and 1970–82 paint

Figure 4.3 Production, consumption, and imports of cereals in sub-Saharan Africa, 1965–84



Note: Consumption is calculated as production plus net imports.
Source: FAO.

a different picture. Countries that experienced satisfactory growth of one type of crop also experienced satisfactory growth of the other. In twenty-five out of thirty-eight African countries, the rate of growth of both food and nonfood production fell in 1970–82 compared with the 1960s. In six countries both growth rates increased; in only five did the rate of growth of food production increase while that of nonfood production fell. And in only two other countries—Kenya and Malawi, which are self-sufficient in food—did the growth of food production slow down while the rate of growth of nonfood production accelerated.

Export and food crops complement each other even more as farmers shift from traditional to modern practices. Modern agriculture requires more tradable inputs. In most of Africa, as well as in many developing countries elsewhere, these inputs must be imported. One obvious way of earning the foreign exchange needed is to expand agricultural exports.

It is likely that, had they followed the right type

Box 4.7 Food self-sufficiency in Asia

Most Asian countries cite self-sufficiency in food as an important policy aim, and many have achieved or are approaching it. India had a large surplus of wheat in 1985. Indonesia achieved self-sufficiency in rice in 1984 and 1985. Bangladesh greatly reduced cereal imports in the 1980s. China shifted from being a major importer of food grains in the 1970s to being a surplus producer in the 1980s. These achievements reflect the efficient adoption of new crop varieties and techniques by Asian farmers and improved policies for agriculture.

More than 22 million hectares were brought under irrigation in South and Southeast Asia between 1966 and 1982, which raised the proportion of total irrigated agricultural land from about 20 percent to more than 28 percent. By the late 1970s, modern rice varieties covered 80 percent of the cultivated area in China, more than 70 percent of the cultivated land in the Philippines and Sri Lanka, and more than 50 percent of such land in Indonesia and Pakistan. Modern varieties of wheat expanded to cover two-thirds of the total wheat area in India. Between 1966 and 1982, total fertilizer consumption increased more than sixfold in Southeast Asia and more than fourfold in South Asia.

But such successes do not necessarily mean that self-sufficiency is a desirable policy. Substantial gains from trade can be forgone in its pursuit. Such losses were evident in China when each province aimed to become self-sufficient in food grains. The same losses can occur if a country restricts trade in world markets. Take the case of Sri Lanka, where research spending, pricing policies, input subsidies, and investment in irrigation have all been geared to achieving self-sufficiency in rice. Many components of the effort were appropriate, but, from an economic point of view, the policies may have been pushed too far. The government's support price for producers of paddy, which is set to provide farmers with a reasonable rate of return, was Rs65 a bushel in 1983. This price is far below the economic cost of producing rice in some areas, because of input subsidies. Adjusting only for the subsidies provided on fertilizers, the economic cost would be about Rs79 a bushel. The largest subsidy, however, is on irrigation water. In the areas of the Mahaweli irrigation system where costs are highest, development costs are almost Rs400,000 an acre (about $17,000). The costs are about half in the median-cost areas. Assuming yields of 160 bushels per double-cropped acre and an opportunity cost of 10 percent, the economic cost of rice would be about Rs250 a bushel in the high-cost areas and about Rs165 a bushel in the median areas. In Burma, by comparison, farmers supply a higher grade of paddy at Rs25 a bushel. Even if the significant subsidies on fertilizers in Burma are taken into account and a part of the costs of the Mahaweli scheme is allocated to activities other than rice growing, there remains a very large gap between marginal costs of production in Sri Lanka and those in Burma.

Countries often fail to capture the potential gains from trade for a complex array of reasons. First, countries may not be able to import at prices which reflect marginal economic costs of production in low-cost exporting countries. Exports in Burma, for instance, are a state monopoly, and the export price is well above the economic costs of production, processing, and marketing. Thailand has often raised its export tax on rice in periods of high world prices, such as 1973–75. Such policies have encouraged import substitution in countries with trade deficits. Second, and conversely, import restrictions in importing countries discourage investments in rice by exporters. Subsidies on rice exports by industrial countries also discourage higher production in low-cost countries. Third, the high cost of self-sufficiency has often been underwritten by grants or concessionary loans from donors. Taken in isolation, many components of each country's policies may have been logical. Taken together, however, they add up to a bias against a well-integrated world agriculture capable of capturing the full benefits from trade.

Box 4.8 Agricultural pricing policies and the environment: the case of Haiti

With a per capita GNP of about $370 in 1985, Haiti is the poorest country in the Western Hemisphere. It is also one of the most densely populated, with 5.3 million people in a total area of 2,800 square kilometers. Much of the country is mountainous. Fifty percent of the land area has a slope greater than 40 degrees and is ecologically suitable for forest cover only. The other half is under cultivation and natural pasture. Farm size is becoming regressive; of the 600,000 farm holdings, more than 65 percent have less than one hectare. Satisfying domestic food requirements is absorbing increasing areas of land, at the expense of cash crops, particularly coffee and cocoa. Intercropping by smallholders using traditional methods, which require few modern inputs, is widespread.

Mounting population pressures, felling of forests for fuel and construction, and increased planting of food crops in hilly areas have led to extensive soil erosion. Other consequences of these pressures are the decreasing viability of farms, declining per capita production, increasing rural poverty, malnutrition, and rural-urban and international migration.

The causes of these developments are complex. They involve both traditional nonmarket phenomena and the government's agricultural pricing and trade policies. Peasant farmers' incentives to produce have been severely constrained by a pervasive structure of informal, often feudalistic, authority and taxes, as well as by insecurity of tenure and the absence of effective technical support from government. Larger holdings have been characterized by absentee ownership.

Over the past fifteen years, the government's agricultural pricing and trade policies have become increasingly divorced from the comparative advantage the country has in the production of coffee and cocoa relative to maize, sorghum, and rice. Domestic prices of these staples have been supported above parity by quantitative import restrictions. At the same time, the government has continued its traditional policy of taxing coffee and cocoa exports. Over the past five years, the ratios of domestic farmgate prices to border prices at official exchange rates have been of the order of 0.5 for coffee and 1.3 for maize, sorghum, and rice. The deterioration in the real value of the Haitian gourde relative to the U.S. dollar means that the staples have been less protected, and coffee has been taxed more heavily, than it appears.

The taxation of coffee and other cash crops has adversely affected income growth and its distribution, nutrition, and the preservation of nonrenewable resources. Soil erosion has reached calamitous proportions. Around 15,000 hectares of cultivated land is being lost to erosion each year. Almost 1.1 million hectares have been denuded of soil and have become essentially wilderness, with little or no vegetation. Coffee trees, which are ecologically suited to the previously forested hillsides, are being replaced by maize and sorghum, which do not bind the soil as well.

A broadly based package of social and economic measures will be necessary if investment, production, and resource conservation are to be stimulated in rural Haiti. Reforms of agricultural pricing and trade policies would have to be an integral component of any such package if long-term growth in the sector is to be attained.

of pricing policies, many developing countries would have progressed further toward self-sufficiency than they in fact have. The key issue, however, is not self-sufficiency, but comparative advantage. If a country can use its resources better on exports—whether agricultural or not—there is little reason for wasting resources to pursue self-sufficiency in food. In Chile, for example, both agricultural exports and imports increased dramatically following the realignment of prices in the early 1970s (see Chapter 5). But, as discussed in Box 4.7, self-sufficiency remains a popular noneconomic objective, and some countries have been willing to incur large costs to attain it.

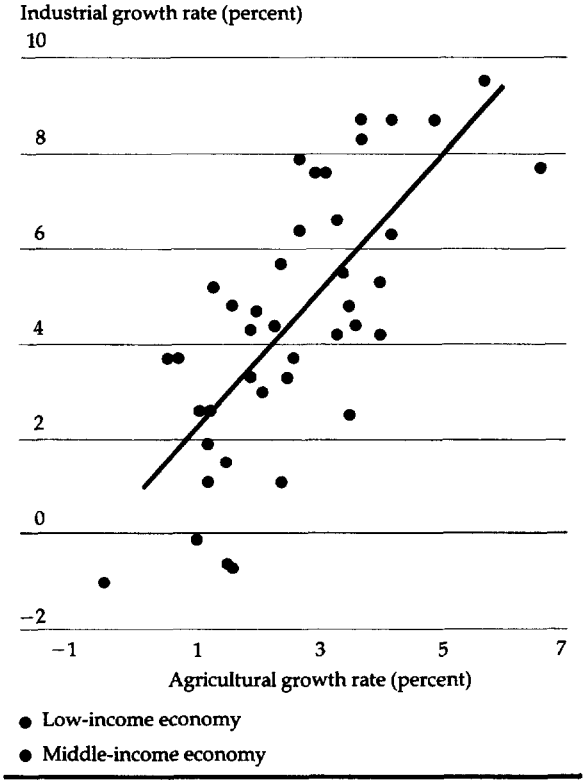
THE COSTS TO THE ENVIRONMENT. Protection of the environment is a task that has recently attracted much attention, especially because of the erosion of arable land in sub-Saharan Africa. Although it is not often realized, the pricing policies that developing countries follow can be important from this point of view also. When farming becomes unprofitable, farmers lose the incentive to care for their land. Equally important, different crops have different effects on soil conservation, and pricing policies may exacerbate soil erosion by inducing farmers to choose the wrong crops. In Haiti, for example, coffee and other tree crops bind the soil on hillsides better than field crops do. The taxation of coffee relative to field crops has had the unfortunate side effect of increasing soil erosion. This is discussed in Box 4.8.

INTERSECTORAL LINKAGES. These illustrations of the bias against agriculture and its costs have focused mainly on agriculture. But the question may

be raised as to whether the sacrifices in agricultural output are offset by growth elsewhere. The effects of wrong policies in one sector are never confined to that sector alone. The experience of decades suggests that a healthy agricultural sector is critical to national growth. Taxing agriculture to force resources to industry will retard agricultural growth, lower domestic food and raw material supplies to industry, and reduce demand for industrial products. This will harm agricultural and industrial prospects in the long run. With some exceptions, such as the oil and mineral exporters, countries with low agricultural growth have low industrial growth and countries with high agricultural growth have high industrial growth (see Figure 4.4). Agriculture's intimate connections with growth and the wider economy mean that the costs of discrimination against agriculture are not borne by farming alone.

The role of agricultural growth in industrialization is well documented in England, where the Industrial Revolution began: the story was the same in Japan between the Meiji Restoration in 1868 and World War I. Substantial transfers of capital and labor from agriculture to the rest of the economy contributed much to Japan's industrial development, but those transfers came about as agricultural productivity increased. The Japanese experience has special relevance to the developing countries because it was achieved by farmers with only small plots of land and did not involve manipulation of the terms of trade against agriculture (see Box 4.9).

Figure 4.4 Average annual growth in agriculture and industry in developing countries, 1973–84



The industrialization of the fast-growing East Asian economies follows to a large extent the Japanese pattern of rapid agricultural growth supporting the drive toward industrial growth. The fact that agricultural and industrial growth complement each other is also evident from recent studies on developing countries. In India, a 1.0 percentage point increase in the agricultural growth rate is correlated with an increase in industrial growth of 0.5 percentage point and in national income of around 0.7 percentage point. Agriculture is linked to industry through rural expenditure on manufactures. Increases in agricultural output raise household and government incomes and the demand for consumer goods. Although per capita incomes in India are higher in towns than in the countryside, the absolute size of the market for manufactured goods is larger in rural areas. Moreover, villagers spend so much of any extra income on manufactures that an increase in agricultural income generates substantial demand for industrial goods. Studies in other countries confirm how important this connection is. In Nueva Ciga province in the Philippines, a 1 percent increase in agricultural income generates a 1 to 2 percent increase in value added in most sectors of the local nonfarm economy. In the Muda district of Malayasia, every $1.00 increase in agricultural output indirectly adds $0.80 in value added to the rest of the village economy.

The role of agriculture envisaged in the strategy of industrialization behind high protective barriers ignores the lessons of history. While it is true that the share of agriculture in national income declines in the long run, transfers of resources from agriculture should come about naturally through growth in its productivity rather than through highly discriminatory policies against agriculture.

Agriculture as a source of tax revenues

In many developing countries the agricultural sector is the largest tax base, and some taxation is unavoidable for financing public expenditures in

Box 4.9 Agricultural taxation in Japan

The contribution of agriculture to the Japanese economic miracle is a test case for the role of agriculture in development. On the face of it, agriculture in Japan displayed many of the characteristics shown in today's developing countries. For most of the past century, its growth rate was less than 2 percent a year, except after World War II, when it became heavily protected. Capital outflows from agriculture were substantial, transferring resources to other sectors of the economy. The agricultural tax system is thought to have played an important role, but, in fact, the lessons from Japan are more complicated.

The net capital flows out of agriculture were especially important in the first quarter century of Japan's development (see Box table 4.9A). They accounted for 27 percent of nonagricultural gross capital formation between 1888 and 1902 and 23 percent between 1903 and 1922. The public sector accounted for about two-thirds of the transfer in the earlier period, but only one-quarter in the later period. Tax transfers, therefore, do not seem to have been a dominant cause of the reallocation of capital for very long, but agricultural taxation was clearly important in the early years of development.

These public sector transfers, however, are only part of the picture. The movement of labor out of agriculture needs to be taken into account. Between 1888 and 1900 (see Box table 4.9B), two-thirds of the increase in nonagricultural labor was due to the migration of farmers and their families; this contribution increased to four-fifths in the next two decades. Econometric models that simulate what would have happened without the transfers of either capital or labor indicate which of the two played the more important role in the development process. The studies concern the periods 1907–37 and 1955–68. Their results suggest that labor migration—and not, as is commonly thought, the flow of savings—had the bigger impact. Given that private capital flows dominated public sector flows throughout both periods, it would appear that neither capital flows nor the tax system has contributed greatly to Japan's success story. This, however, may not have been true during the first quarter century of Japanese development, when tax transfers were largest. The public sector may have played an important role before the private sector was able to allocate private savings among different sectors of the economy.

The nature of the tax mechanism used in Japan was also of great importance. In sharp contrast to the case in many of today's developing countries, taxes were levied by a direct land tax. This did not undermine agricultural incentives by lowering producer prices. On the contrary, agriculture's terms of trade generally improved from 1888 until the 1930s, when the terms of trade turned moderately against it under the influence of increased agricultural supplies from Japan's colonies. Furthermore, the level of agricultural taxation was low in comparison with the tax burdens common in developing countries today. As shown in Box table 4.9C, the tax burden was less than 7 percent of gross output and less than 9 percent of value added; it was falling throughout the period.

Box table 4.9B Intersectoral movements of labor in the Japanese economy, 1888–1940

Period	*Outflow of agricultural labor force (millions)*	*Increase in nonagricultural labor force (millions)*	*Agricultural contribution (percent)*
1888–1900	1.5	2.3	67
1900–1920	3.7	4.7	79
1920–1940	3.7	7.3	51

Source: Ueno (background paper).

Box table 4.9C Tax burden as a share of output and value added in agriculture in Japan, 1888–1937

Period	*Direct tax as a percentage of gross output*	*Direct tax as a percentage of value added*
1888–1902	6.8	8.6
1903–1922	5.8	7.2
1923–1937	5.1	6.4

Note: Value added is gross output minus current input.
Source: Ueno (background paper).

Box table 4.9A Capital flows from agriculture to nonagriculture by source of flow, 1888–1937

	Net public sector		*Net private sector*	
Period	*Flows (millions of yen)*	*Percentage of nonagricultural investment*	*Flows (millions of yen)*	*Percentage of nonagricultural investment*
1888–1902	36	18	19	9
1903–1922	65	6	198	17
1923–1937	−37	−2	−30	−1

Source: Ueno (background paper).

agriculture and elsewhere. The key issue is not whether agriculture should be taxed, but how developing countries can avoid the excessive costs of taxing agriculture.

Whether revenues accrue to the central government, to a state government, or to a parastatal, all too often revenue requirements are taken as fixed before taxation policies are designed. The most common error is to assume that a certain amount of revenue has to be raised. Public expenditure policies and taxation policies need to be examined together. There are often great wastes in public expenditures—for example, in the financing of inefficient and highly capital-intensive industrial projects that are entailed in forced industrialization strategies. And, as the next chapter will show, there are reasons to doubt the efficacy of spending on programs that bear more immediately on the agricultural sector. Apart from exploring the scope for reducing the total revenue raised from agriculture, governments should also be concerned with the form of taxation.

The previous sections have given some indication of the high costs of agricultural taxation. There are two reasons they are so high. First, countries have relied heavily on export taxes or on the pricing policies of export marketing boards because of the perceived difficulties of administering direct taxes in rural areas. Second, the rates of taxation on specific exports have often been high. As shown in Box 4.10, the losses in real national income due to export taxes increase more than in proportion to increases in the tax rate. These losses are referred to by economists as efficiency costs, or efficiency losses.

The remedies for the high cost of taxation lie in the use of other tax instruments or, to the extent that countries are obliged to use export taxes, in lower rates. Searching for efficient ways to tax agriculture is clearly a matter of high priority in developing countries, although taxation should not be so great as to produce the sort of discrimination against agriculture described earlier in this chapter. With commodity taxes, the preferred approach is to focus on consumption rather than production. Commodity-specific excise taxes and broadly based value added taxes that bear on commodities purchased for consumption offer a convenient means of raising substantial amounts of revenue without impairing the efficiency of production. Although their imposition at the retail level may be beyond the administrative capabilities of most developing countries, taxes on consumer goods are regularly applied at the point of import or at the factory gate. To the extent that more of these goods are consumed by the relatively rich, this option also contributes to the overall progressivity of the tax system. As a source of revenue, greater use of economy-wide taxes on consumption offers an important alternative to the excessive taxation of agricultural production.

Direct taxes offer another alternative to export or

Box 4.10 The efficiency cost of export taxes

The loss in real national income caused by a tax is referred to as its efficiency cost. The efficiency cost of a tax is additional to the administrative and collection costs and summarizes the net impact of that tax on producers, consumers, and the government's budget.

In the case of an export product, for example, the tax will lower the price to producers and consumers and generate revenues for the government. The losses of the producers will have to be offset against the gains to consumers and the government. The efficiency cost per unit of revenue raised is a useful indicator in practice. At the margin, the cost per unit of revenue increases more than proportionately to the tax rate.

To illustrate this, assume that the exports of a commodity rise in proportion to its price—that is, if the border price increases by 10 percent, the export volume also increases by 10 percent. On that assumption, the efficiency loss for the last unit of revenue raised from an export tax (t) is $t/(1-2t)$.

Thus, if the export tax is 5 percent, getting the last dollar of tax revenue will cost only 5.6¢. If, however, the tax rate is 40 percent, the last dollar of revenue will cost two dollars. Indeed, beyond 50 percent, total revenues will decrease when the tax rate is increased, so that it would be pointless to increase the tax further. This result is important for two reasons. First, the export supply response assumed above may well be conservative. This is quite likely because as the price increases, producers produce more and consumers consume less—the exportable surplus increases for both reasons. Second, as noted in the text, export taxes have often been very high, especially when excessive parastatal margins are taken into account.

output taxes. The taxation of land is an approach that has been used successfully in the past. Since land taxes are paid regardless of how the land is used, they discourage increases in productivity less than does taxation through depressed prices. The Japanese experience with an agricultural land tax is an object lesson in reducing the distortions caused by taxation (see Box 4.9). In this case, the rate of taxation was also moderate—it captured less than 7 percent of agricultural value added in a sector that was benefiting from rising relative prices. And Japan's land tax was not unique in the late nineteenth and early twentieth century. The agricultural tax system in Thailand, for instance, was also based on a land tax. Since there was an open land frontier in Thailand and since there was concern that a land tax would discourage settlement of new land, the tax was not applied to newly cultivated land. Different tax rates were applied to different kinds of land according to their fertility. As in Japan, rates were kept low (between 5 and 10 percent of agricultural output). Rights to land were linked to a household's ability to settle, cultivate, and meet the tax obligations on the land. The tax system and land settlement policy established a system of independent smallholders that is still evident in a low rate of landlessness and Thailand's particular tenancy arrangements.

Despite its attractions, land taxation, once a significant means of raising revenue, is now rarely used. Its demise cannot be explained by high administrative and collection costs alone. A land tax register can be much less detailed and accurate than the registers needed to establish ownership rights. Recent developments in satellite imagery and readily available information on access to water and proximity to markets can be used to set up a workable land classification. Given the attractiveness of land taxation, expenditures involved in generating such information are likely to be worthwhile. Market prices for land can also provide estimates of the quality of different types of land.

But broadly based land taxes are not the only alternative to commodity taxes. Other alternatives exist in most countries. For example, where the taxpaying unit can be easily identified and the potential revenue per taxpayer is large, the application of standard income taxes is both equitable and cost-effective. This is an easy option in countries where significant production takes place in private or public estates. Tea and tobacco estates in Malawi, for example, have long been subject to personal income tax—collected on a pay-as-you-earn basis—and to company income tax. In contrast, with one minor exception in fiscal 1985, estates have not been subject to export taxes. In this way, substantial amounts of revenue have been generated without depressing producer incentives. This approach could be replicated in other countries where land ownership is highly concentrated. In Latin America, for example, about 1 percent of the population controls more than 50 percent of the land and accounts for almost one-third of agricultural output and more than one-sixth of total GNP. The application of an income tax in such circumstances may be a more effective means of taxation than efforts to introduce a more broadly based but imperfectly implemented land tax.

This approach parallels procedures in other sectors of the economy where income taxes are usually confined to large-scale enterprises. Development of the tax system then involves expanding the tax base by gradually incorporating smaller and smaller units. In agriculture, this process can be accelerated by using export taxes as presumptive income taxes—that is, export taxes or other output taxes can be viewed as a prior collection of income tax. Large estates and other entities paying income tax on a regular basis would credit payments of export taxes against their income tax liabilities. Smaller concerns which may not have paid income tax in the past would have the option of submitting a return should their payment of export taxes seem excessive. Given that agricultural incomes are usually much lower than those in urban areas and may often be below the standard exemption for income tax, this procedure implies rates of effective export tax that are substantially lower than those prevailing in many countries.

Yet another option is the use of multitiered price systems whereby the tax falls on the intramarginal quota rather than at the margin. The agricultural pricing system prevailing in China before 1985 provides an example. To maintain incentives for increased output at the margin, farmers were paid a higher "above quota" price (or an even higher negotiated price) on supplies in excess of their quota deliveries. This approximated a land tax: the farmers were obliged to pay a fixed tax (equivalent to the difference between the quota price and the higher price on residual sales multiplied by the quota deliveries) and were free to sell all residual output at a free market price. However, the approximation was not exact. Quota deliveries were restricted to basic food grains and a few other commodities that enter the subsidized food distribution system. Thus, there was an incentive to evade the burdens and a need to restrict the freedom of

choosing which crops to grow. Quotas were set at different levels in different regions, depending on the state's need for particular commodities, so that the farmer's ability to exceed "quota" deliveries, and therefore to gain access to high marginal prices, varied a great deal. Despite the disadvantages of such a multitiered system, it should still be an improvement over the high marginal tax rates imposed by marketing parastatals in many countries.

It is also important to examine direct taxation options for cost recovery in various projects financed by the government. Public sector projects in agriculture raise land values and thus create a potentially useful tax base. Even if land taxes are not possible in all areas of the country, betterment levies in project areas generally are. This issue is explored further in the next chapter in the context of irrigation projects.

This review of agricultural policies in developing countries has not focused on the assistance that governments have sought to provide through price stabilization and farm input subsidy measures, nor has it reviewed the efficacy of consumer subsidy programs in alleviating poverty and malnutrition. Do such programs reduce the bias against agriculture, or do they exacerbate it? That is the central question addressed in the next chapter.