
AGRICULTURAL POLICIES, PRICES AND PRODUCTION

A. Introduction

Throughout the early post-colonial period in Africa there were two basic approaches to the development of agriculture. The first aimed at “modernizing” smallholder agriculture through the promotion of specialization, standardization and increased use of productivity-enhancing inputs and quality control, particularly by means of integrated rural development projects. The second aimed at channelling resources into highly capitalized indigenous private agribusinesses and state farms. Both these approaches sought to address undercapitalization and structural constraints in African agriculture, but had serious shortcomings in their design and implementation.

At the beginning of the past decade policy reforms were initiated in line with the view that what mattered most for agricultural development were market incentives. It was argued that much of the poor performance of agriculture in SSA was due to excessive taxation of farmers by governments. According to this view, policies designed to extract resources from agriculture in order to promote industrial development and to provide subsidized goods and services to the urban economy undermined agricultural development by reducing the attractiveness of farming:

African farmers have faced the world’s heaviest rates of agricultural taxation ... explicitly through producer price fixing, export taxes, and taxes on agricultural inputs. They

were also taxed implicitly through overvalued exchange rates, and through high levels of industrial protection ... The high rates of taxation contributed to sub-Saharan Africa’s alarming decline in ... agricultural growth.¹

Reforms have accordingly aimed at removing distortions in the incentive structure. The initial thrust of reforms was to realign producer prices with world prices through marketing boards and to correct overvalued exchange rates. From the late 1980s onwards there was wider recognition of the importance of structural constraints,² but in reality greater attention has been paid to deregulating agricultural markets by dismantling the marketing boards and allowing a greater role for private actors in both product and input markets. Current best practice in agricultural policy is now regarded as including unsubsidized market-determined prices for both inputs and outputs, prices at border parity determined on the basis of “adequate” exchange rates, and economically neutral taxation of agriculture and other sectors. On this view, governments’ responsibility is to maintain access to markets, ensure dissemination of information, and provide adequate legal and regulatory frameworks, rather than to intervene in prices.³

However, despite intensive reforms over a number of years, the supply response to price liberalization has been much less than expected,

raising several questions about the underlying rationale of the reforms. First, have governments in SSA really taxed agriculture excessively, especially compared with the rest of the developing world? Second, how far have price reforms removed taxation and resulted in greater incentives for farmers? Lastly, are price incentives the only, or even the most important, component of agricultural growth and development?⁴ Addressing these questions is essential for greater understanding of the factors affecting agricultural development, including the role of price and non-price incentives, the provision of public goods, and structural and institutional impediments to supply response. That is the purpose of this chapter.

The next section enlarges on the brief analysis of the behaviour of agricultural prices presented in *TDR 1997*, covering a wider range of prices, using a broader sample of countries and products, and making international comparisons.⁵ This is followed by a discussion of various factors affecting supply behaviour in SSA, and of the role of public investment in removing structural impediments.

The analysis shows that export crops were not always taxed through price-fixing much more in African than in other major producing countries and that subsequent liberalization of agricultural markets has not always reduced the margin between export prices and producer prices. Secondly, the domestic terms of trade for agriculture in SSA were generally kept above the world terms of trade

between agricultural commodities and manufactures. This was partly due to price and subsidy policies in favour of food crops. Since reforms began, agricultural terms of trade and real producer prices have generally performed better in those countries that have continued with interventionist policies in agricultural marketing than in those with more liberal policies.

The behaviour of production and exports noted in the last chapter has been influenced by a number of factors, including the policy reforms. In the context of falling world prices, incentives provided through pricing and exchange rate reforms have been weak. Recovery in production in the mid-1980s coincided with the turnaround in net resource flows (chapter I, chart 7) and the recovery in imports. Increased availability of consumer goods in rural areas in some cases, and pressure to satisfy basic consumption needs in others, appear to have contributed to a positive short-run supply response in some countries. Where devaluations have corrected major exchange rate misalignments, exports recovered, partly because they were diverted into official channels. But adjustment policies have failed to address a number of institutional and structural impediments to increasing agricultural productivity and output. Removing such impediments would have called for increased public investment in agricultural infrastructure and research, but this has not been possible under fiscal retrenchment characteristic of adjustment programmes.

B. Agricultural prices

1. Taxation of export crops

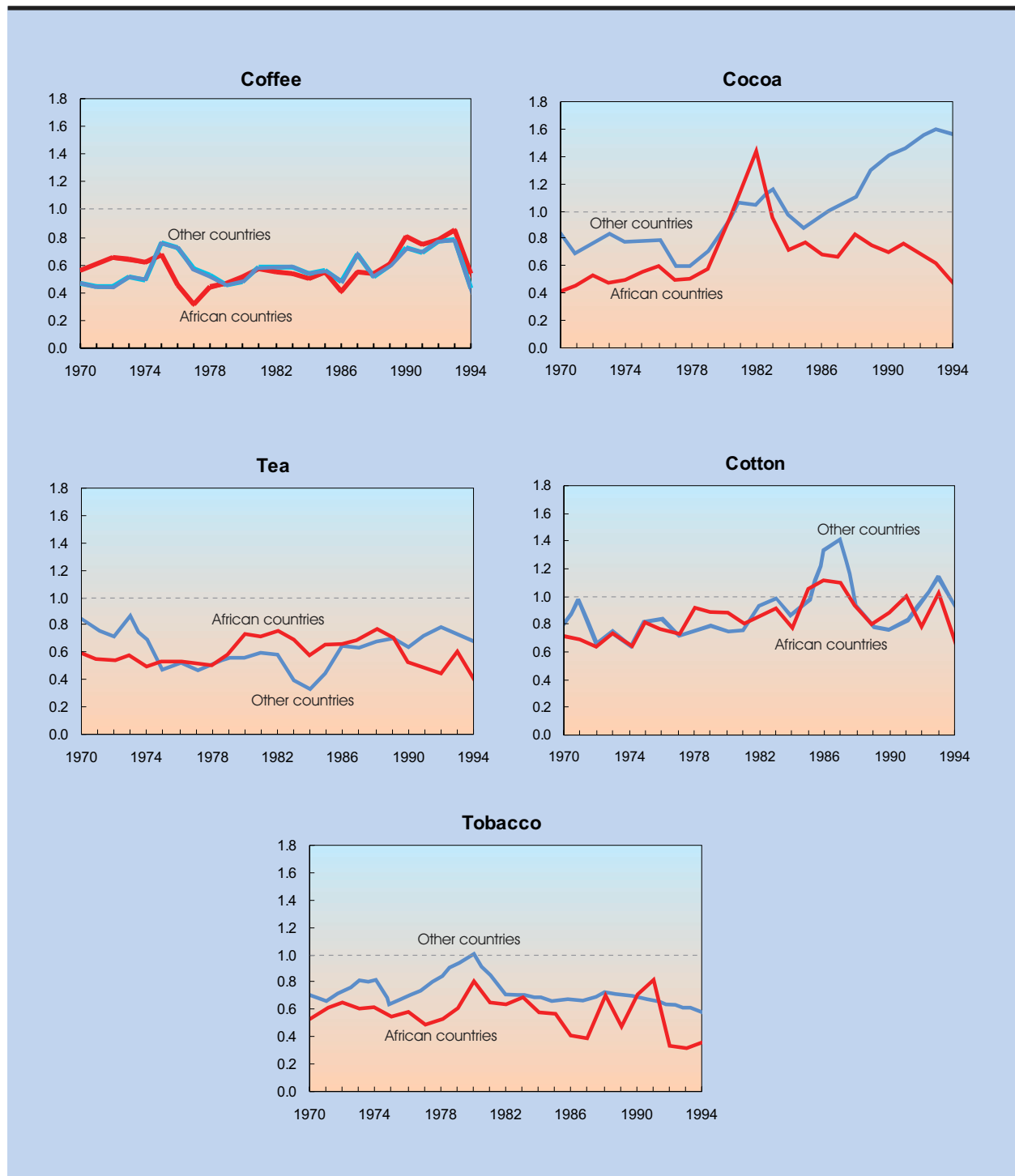
One way of addressing the question of "taxation" of agriculture is to examine the margin between export prices (in national currency) and prices received by farmers for major export crops, and to compare the margins between major African and non-African exporters of these crops.⁶ Chart 15 presents estimates of the evolution of the ratio of prices received by farmers to border (unit ex-

port) prices for coffee, cocoa, tea, cotton and tobacco since 1970. This relative magnitude, which is a non-adjusted nominal protection coefficient (NPC), gives a measure of the rate of surplus extraction from farmers by exporters.

Clearly, the margin between export and producer prices indicates a surplus extraction only when producers and exporters are different entities, and not when producers export directly, as in

Chart 15

**RATIO OF PRODUCER PRICES TO BORDER PRICES^a FOR FIVE MAJOR EXPORT CROPS:
COMPARISON BETWEEN AFRICAN AND OTHER DEVELOPING COUNTRIES, 1970-1994**



Source: UNCTAD secretariat calculations, based on FAO, FAOSTAT database; and IMF, *International Financial Statistics* (tapes).

Note: The country samples are as follows: **Coffee exporters:** *African:* Burundi, Cameroon, Côte d'Ivoire, Ethiopia, Guinea, Kenya, Madagascar, Malawi, Rwanda, Uganda, United Republic of Tanzania. *Other:* Colombia, Costa Rica, Guatemala, Indonesia. **Cocoa exporters:** *African:* Côte d'Ivoire, Ghana, Guinea, Nigeria. *Other:* Dominican Republic, Ecuador, Malaysia, Indonesia, Papua New Guinea. **Tea exporters:** *African:* Burundi, Cameroon, Kenya, Malawi, Rwanda, United Republic of Tanzania, Uganda. *Other:* India, Indonesia, Sri Lanka, Turkey. **Cotton exporters:** *African:* Burkina Faso, Burundi, Cameroon, Chad, Mali, Sudan, Uganda, United Republic of Tanzania, Zimbabwe. *Other:* Egypt, India, Pakistan, Paraguay, Syria, Turkey. **Tobacco exporters:** *African:* Malawi, Zambia, Zimbabwe. *Other:* India, Indonesia, Republic of Korea, Thailand, Turkey.

^a Unit value of exports.

the case of plantation- and TNC-based agribusiness. Moreover, it does not necessarily represent explicit taxation by governments in the sense used in conventional analysis. Such a margin also exists in the case of private traders and exporters. Nevertheless, public marketing boards were the principal exporting agents in Africa until the early 1990s, while similar institutions were less widespread elsewhere. In what follows, however, the term "tax" is used to describe the margin between export and producer prices regardless of the institutional arrangements in the markets for export crops.

It should be noted that this is a crude approximation of the degree of taxation since no allowance is made for marketing and transportation costs and any other value added between the initial (on-farm) and export stages of the marketing chain. However, since domestic transaction costs are generally higher in African countries than in most other developing countries, the observed NPC values may overstate the extent of taxation of farmers in SSA countries compared with other developing countries. Nevertheless, there may also be greater value added between the farm and the export stages among non-African exporters, accounting for part of the margin between the border and producer prices.

The rate of taxation is not independent of the exchange rate. The border price is determined by the nominal exchange rate and dollar prices received by exporters in international markets. A lower exchange rate would thus raise the domestic currency prices received by exporters. If prices paid to farmers remain unchanged, or are raised by less than the rate of devaluation of the currency, the tax rate will rise. Indeed, such behaviour was observed after the post-1986 devaluations in a number of countries in SSA when prices received by farmers declined relative to unit export values. However, even when devaluations lead to a widening of the margin, they tend to raise real producer prices of export crops vis-à-vis non-tradables, thus providing incentives for exports.

It is generally agreed that the currencies of many SSA countries were overvalued during the period from the mid-1970s to the mid-1980s. However, the evidence presented in chart 15 does not support the conventional view that African producers have always been more heavily taxed than those in other developing countries through crop pricing policies. Indeed, it suggests that this claim

is a gross oversimplification. A commodity-specific comparison of African and non-African exporters presents a much more complex picture:

- For *coffee*, on average the ratio of producer prices to border (unit export) prices does not appear to have been very different between African and non-African producers except during 1975-1977, when the level of taxation in Africa was higher. Producer prices were around 50 per cent of actual border prices in both instances from 1979 to 1988, and then increased sharply before falling back to their previous levels.
- *Cocoa* producers in Africa were always more heavily taxed than in other developing countries, except for a brief interlude in the early 1980s. Producer prices in Africa were on average 55 per cent below actual border prices throughout the 1970s, against 60-80 per cent for their competitors. The situation improved in Africa briefly after 1980, but soon deteriorated significantly when the benefits of devaluations were retained primarily by exporters. Paradoxically, taxation appears to have risen during the reform period in Africa. By contrast, since the late 1980s, prices received by non-African cocoa producers appear to have exceeded the export unit values, which suggests that exports were subsidized.
- For *tea*, taxation was higher in Africa at the beginning and the end of the period under consideration. However, unlike in the case of cocoa, Africa had lower rates of taxation of producers for roughly half of the period covered. During most of the 1980s, African producer prices averaged around 70 per cent of border prices, whereas the ratio was generally below 50 per cent for other developing country producers.
- Taxation of *cotton* appears to have been more moderate and stable than that of tree crops, among both African and non-African producers, and no major difference emerges between the two groups of countries in this respect. The moderate downward trend of the tax rates in the 1980s was reversed subsequently in both groups of countries.
- For *tobacco*, the proportion of border prices received by African producers has consistently been lower than that received by non-African

producers, particularly since the late 1970s. A rising rate of taxation set in after 1980.

Therefore, while in some cases African farmers have indeed faced very heavy taxation compared with other major exporting countries, in other cases they have not.⁷ Of the five export crops studied, it is only for cocoa and tobacco that the ratio of producer prices to border prices before the reform process was significantly lower in Africa than in the other major exporters. For coffee and cotton there appears to be no significant difference in the ratio of producer to border prices between African and non-African countries during the pre-reform era. The findings of earlier research – to the effect that the African producers faced higher rates of taxation – were based on a sample of three countries, two of which were major cocoa exporters, and also reflect the adverse effects of exchange rate overvaluation.⁸

Chart 15 also suggests that price reforms in Africa have not always led to lower rates of taxation of export crop producers. Since the mid-1980s, the ratio between producer and export prices has declined for all products considered here except coffee. This implies that the benefits of devaluations during that period accrued to traders more than to farmers. Nevertheless, it should be noted that not all SSA countries in the chart are “reformers”. An analysis of price movements differentiating between reformers and non-reformers is contained in subsection 3 below.

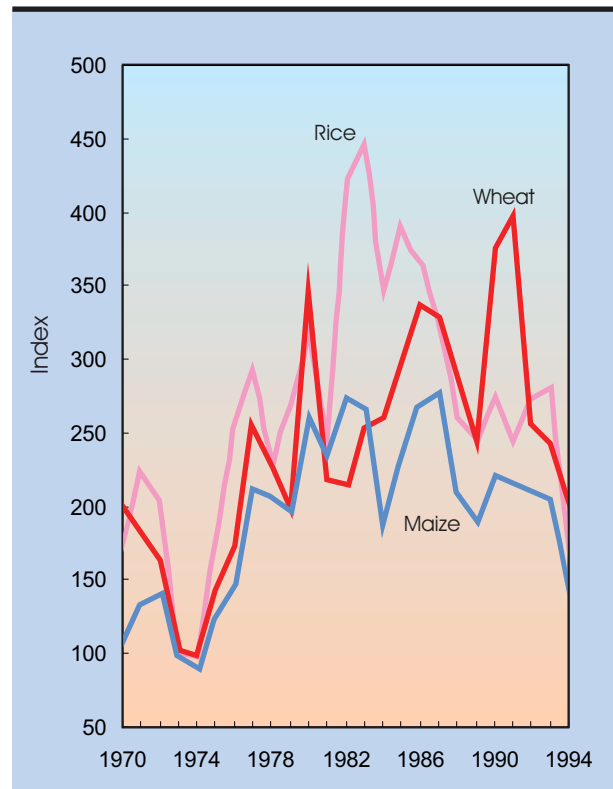
The relevant comparison for traded (importable) food crops such as cereals is between the prices received by farmers and import costs in domestic currency. The latter are determined by world prices and exchange rates, while the former are influenced by pricing and subsidy policies. A positive margin between the prices received by farmers and unit import costs indicates protection of food crop farmers. By raising import costs, devaluations permit reduction of direct price supports of food crops and/or subsidies.

Chart 16 shows the evolution of average ratios of producer prices to world prices (expressed in domestic currencies) for cereals between 1970 and 1994 in a number of countries in SSA. It is apparent that prices received by farmers progressed faster than world prices until the mid-1980s, a fact which indicates high rates of implicit subsidization. Again, market-based reforms and devaluations are possible reasons for the subsequent reversal.

Chart 16

RATIO OF PRODUCER PRICES TO WORLD MARKET PRICES FOR THREE MAJOR CEREALS IN SSA, 1970-1994

(Index numbers, 1973 = 100)



Source: UNCTAD secretariat calculations, based on UNCTAD, *Commodity Price Statistics*; and FAO, *FAOSTAT* database.

Note: Ratios are calculated on the basis of prices received by farmers and world prices expressed in domestic currencies at current exchange rates. Averages are for the following countries: *wheat*: Burundi, Chad, Ethiopia, Kenya, Malawi, Niger, Sudan, Uganda, United Republic of Tanzania, Zambia; *maize*: Burkina Faso, Burundi, Cameroon, Chad, Côte d'Ivoire, Ethiopia, Ghana, Guinea, Kenya, Madagascar, Malawi, Mali, Niger, Nigeria, Senegal, Sudan, Uganda, United Republic of Tanzania, Zambia; *rice*: Burkina Faso, Burundi, Cameroon, Chad, Côte d'Ivoire, Ghana, Guinea, Kenya, Madagascar, Malawi, Mali, Niger, Nigeria, Uganda, United Republic of Tanzania, Zambia.

2. Terms of trade and real producer prices

The analysis above is a simplified version of the conventional approach to the taxation of export crops. It focuses on output prices alone and ignores the prices paid for the products purchased by farmers. It is indeed the prices of output rela-

tive to inputs and to consumer goods purchased by producers that determine the latter's real incomes and consumption, and hence influence their production and investment decisions. The broadest measure of this relative price is the domestic terms of trade of agriculture.

This subsection concentrates on trends in the agricultural terms of trade in SSA for a sample of 20 countries, using two measures. The first refers to agriculture as a whole and is measured as the ratio of the implicit agricultural GDP deflator to the implicit non-agricultural (or manufacturing) GDP deflator. These domestic terms of trade are contrasted with world terms of trade, obtained by deflating the world prices of agricultural products with unit export values of manufactures. The second indicator – real producer prices – refers to specific agricultural products and is measured by the ratio of producers' prices to the domestic consumer price index.⁹

Chart 17 presents trends in agricultural terms of trade in world markets and SSA. There is almost an uninterrupted decline in world terms of trade for agricultural products from 1973 to 1995. Although the decline was somewhat moderate after 1986, and there was an upturn during 1994-1995, the average indices for 1987-1995 were about 60 per cent and 40 per cent below the 1973 levels for "all food" and "raw materials", respectively.

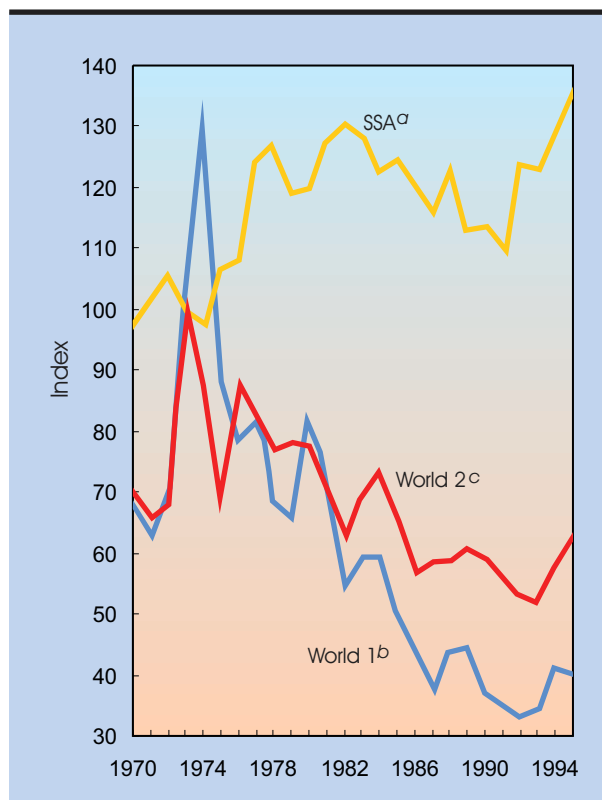
However, the domestic terms of trade of agriculture in SSA show quite different behaviour. After rising during the first half of the 1970s, they remain broadly stable until the early 1990s before rising again; the average index for 1987-1995 is 13 per cent above the 1973 level. Hence, in general, farmers in SSA appear to have been protected from adverse trends in world terms of trade for agricultural commodities.

Again, there is a need for caution in interpreting this evidence because of differences between the commodity compositions of the two terms of trade series. This could reduce the reliability of comparisons, particularly when price dynamics are different for different commodities. Indeed, prices of non-tradable food appear to have been an important factor in the better performance of the domestic terms of trade. However, this alone does not account for the large disparity in the movements of agricultural terms of trade between world markets and SSA. The evidence regarding

Chart 17

TERMS OF TRADE OF AGRICULTURE: COMPARISON OF SSA AND THE WORLD, 1970-1995

(Index numbers, 1973 = 100)



Source: UNCTAD secretariat calculations, based on UNCTAD, *Commodity Price Statistics*; and World Bank, *World Development Indicators 1997* (CD-Rom).

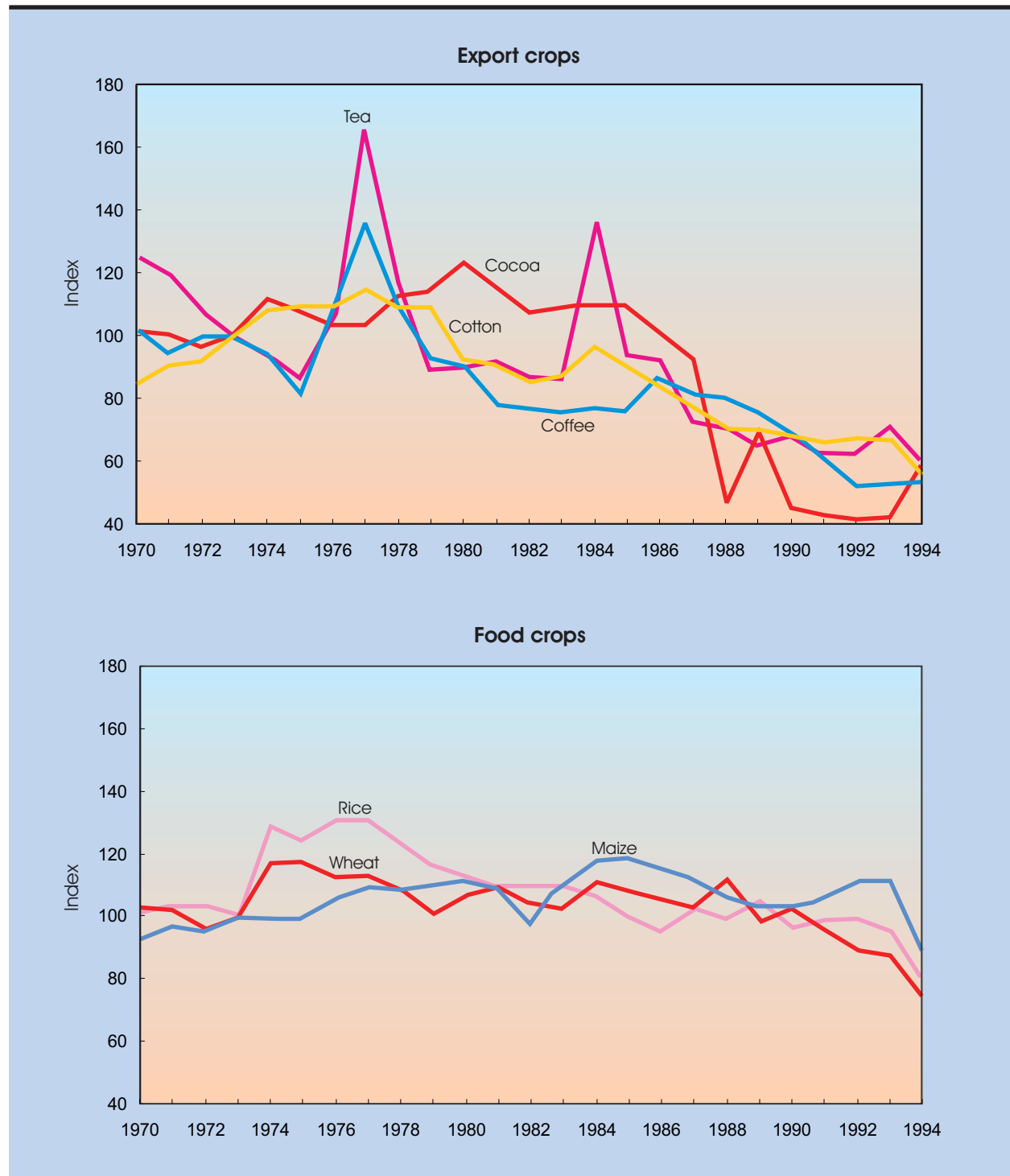
- a** Unweighted average of the domestic terms of trade of agriculture for Burkina Faso (except for 1995), Burundi, Cameroon, Côte d'Ivoire, Ghana, Kenya, Madagascar, Malawi, Mali, Nigeria, Senegal and Zambia. The domestic terms of trade of agriculture are measured by the ratios of the implicit sectoral deflator for agriculture to the implicit sectoral deflator for industry.
- b** Ratio of world free market price index for "all food" (tropical beverages, food, vegetable oilseeds and oil) to the unit value index of exports of manufactures from developed market economies.
- c** Ratio of world free market price index for agricultural raw materials to unit value index of exports of manufactures from developed market economies.

real producer prices suggests that SSA pricing policies, particularly with respect to tradable food crops, played an important role in stabilizing domestic terms of trade for agriculture.

Chart 18 shows trends in real producer prices from 1970 to 1994 for four major export crops

SUB-SAHARAN AFRICA: REAL PRODUCER PRICES FOR SELECTED EXPORT AND FOOD CROPS, 1970-1994

(Index numbers, 1973 = 100)



Source: UNCTAD secretariat calculations, based on FAO, FAOSTAT database; and IMF, *International Financial Statistics*.

Note: Real producer prices are nominal prices received by farmers divided by the consumer price index. Data are unweighted averages for the following countries: *cocoa*: Cameroon, Côte d'Ivoire; *coffee*: Burundi, Côte d'Ivoire, Ethiopia, Kenya, Madagascar, United Republic of Tanzania; *cotton*: Burkina Faso, United Republic of Tanzania; *tea*: Burundi, Kenya; *wheat*: Burundi, Ethiopia, Kenya, Niger, Sudan, United Republic of Tanzania, Zambia; *maize*: Burkina Faso, Burundi, Cameroon, Côte d'Ivoire, Ethiopia, Ghana, Kenya, Madagascar, Niger, Nigeria, Senegal, United Republic of Tanzania, Zambia; *rice*: Burkina Faso, Burundi, Cameroon, Côte d'Ivoire, Ghana, Kenya, Madagascar, Niger, Nigeria, United Republic of Tanzania, Zambia.

and three food crops in SSA countries. Overall, the contrast between the sharp deterioration for export crops and a high degree of stability for food crops is striking. Real producer prices of cocoa, coffee, cotton and tea in the early 1990s were 40-50 per cent lower than their average levels during the 1970s. For cereals, real domestic prices in SSA were relatively stable over the same period, with some modest declines after the mid-1980s. A comparison between domestic and international prices shows that while in real terms, domestic prices of export crops generally followed the downward trend in international prices, for cereals those prices were higher and more stable (chart 19).

Movements in domestic terms of trade and real producer prices are influenced by a host of factors, including developments in world markets for agricultural commodities and manufactures, government intervention in national output and/or input markets, and exchange rate policies. Generally, in most African countries government intervention until recently favoured food crops over export crops through price supports and subsidies. This, together with overvalued exchange rates, kept food prices high relative to export crops. With market liberalization, the prices of both food crops and export crops have been linked more closely to world prices, but more so for export crops. Devaluations only partly compensated for the downward trend in real prices of export crops in world markets while, as noted above, at the same time widening the rate of taxation. Consequently, in general, real producer prices for export crops fell throughout the 1980s while those for cereals rose or fell less. These differing trends are shown in chart 20 for changes between the average prices in 1981-1983 and in 1992-1994 for a number of food and export crops in various countries. Nevertheless, despite this broad tendency, there are important differences in the behaviour of real prices of the same food and export crops in different countries, reflecting in large part differences in exchange rate policies and the extent and type of intervention in agricultural product markets.

3. Policy reforms and agricultural prices

The findings discussed above show that despite widespread market-oriented agricultural price reforms, the past ten years have not produced significant improvements in relative prices and terms of trade for agriculture or lowered the rates

of taxation of farmers. A more direct way of studying the impact of these reforms is to compare the price movements between "reforming" countries and those that continued with "interventionist" policies. Here, this exercise is carried out for the same set of prices examined above, with countries classified on the basis of their policy regimes as evaluated by the World Bank in its study *Adjustment in Africa* cited above.¹⁰

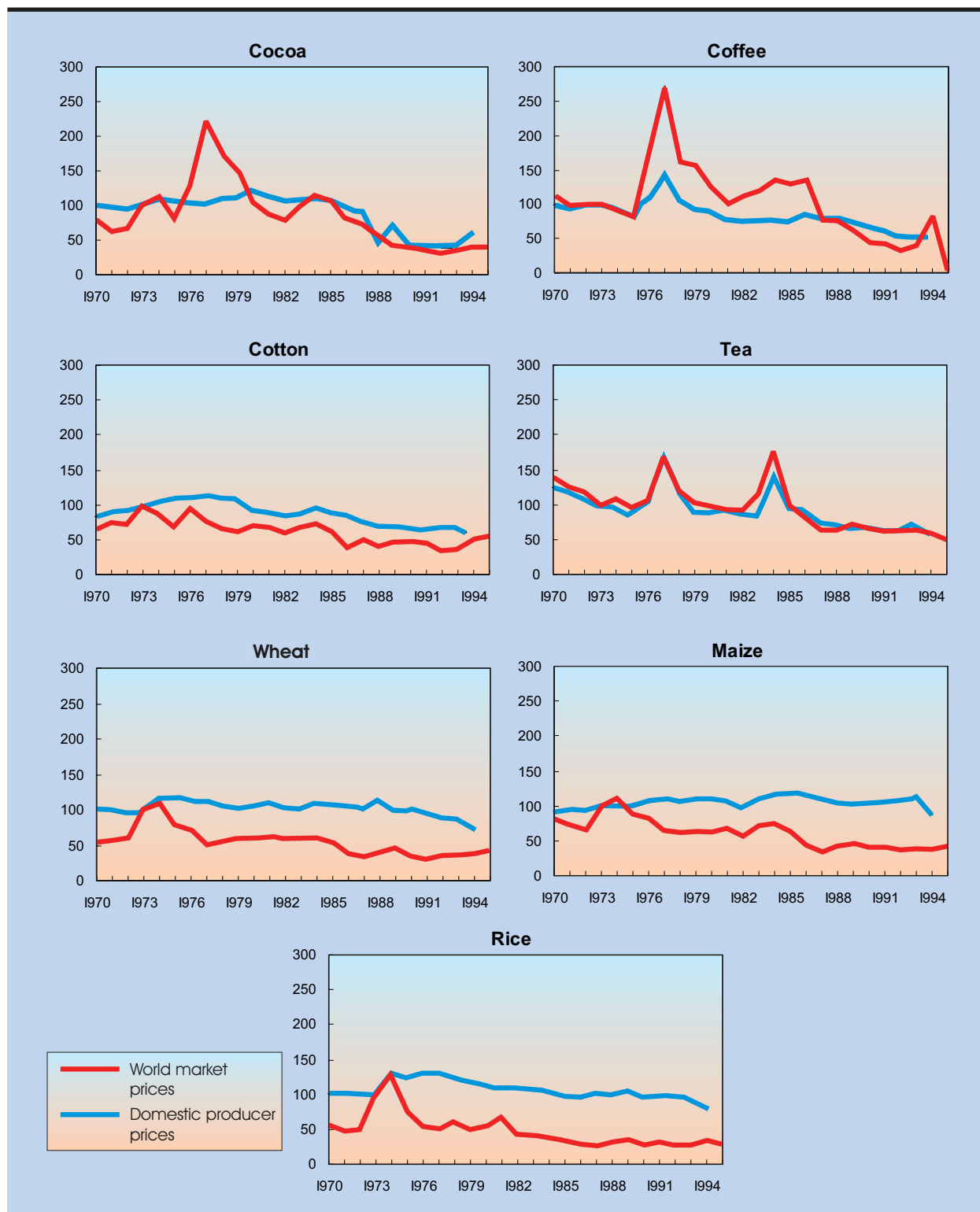
Chart 21 shows that since 1984 the overall domestic terms of trade for agriculture have moved much more favourably in the "heavy intervention" countries than in the "light intervention" ones. As of 1993, the former group had achieved an improvement of 24 per cent compared with a 7 per cent decline in the latter.

The impact of policy regimes on real producer prices is examined here by classifying major African producers of cocoa, coffee, cotton, tea and cereals into groups with "continued interventionist", "continued liberal" and "newly liberalized" policy regimes vis-à-vis agricultural markets as defined by the World Bank. For export crops, with the exception of coffee until 1992, real producer prices have performed better since 1984 in those countries which have continued with interventionist policies in the markets for the specified commodities than in those with more liberal policy regimes (chart 22). This is consistent with the findings reported in the World Bank study,¹¹ which show that in those countries which had continued with centralized producer pricing, there was an increase of 4.8 per cent in the domestic real producer prices for export crops, whereas there was a fall of 18.8 per cent in countries which had shifted from centralized pricing to indicative pricing or total deregulation. For food crops, it appears that farmers in countries with a high degree of intervention in agricultural markets enjoyed significantly better relative prices than the average, particularly during more recent years.

The picture is much the same regarding the taxation of export crops, as measured by the ratio of prices received by farmers to border prices (chart 23). In countries with ongoing or newly liberalized marketing arrangements this ratio fell faster or rose much less rapidly than in countries with continued government intervention, with once again the single exception of cocoa. The impact of the policy regime on relative movements between import and producer prices of cereals is more ambiguous.

REAL WORLD MARKET PRICES AND REAL PRODUCER PRICES IN AFRICA FOR SELECTED PRIMARY COMMODITIES, 1970-1995

(Index numbers, 1973 = 100)



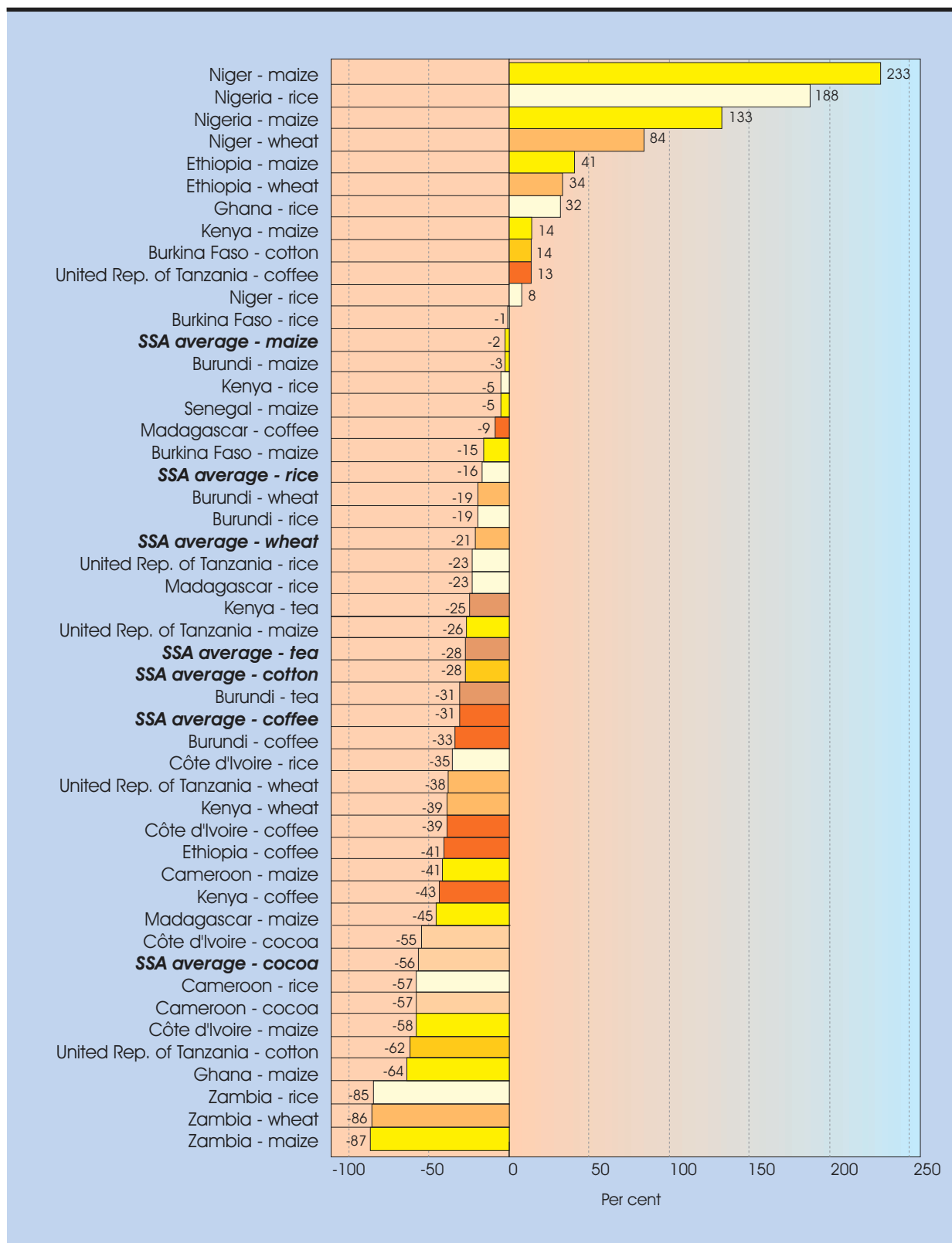
Source: UNCTAD secretariat calculations, based on UNCTAD, *Commodity Price Statistics* (tapes); FAO, *FAOSTAT*; and IMF, *International Financial Statistics* (tapes).

Note: Real world market prices are nominal prices deflated by the unit value index of exports of manufactures from developed market economies. Real producer prices are nominal prices received by farmers deflated by the consumer price index. Averages of real producer prices relate to the countries specified in chart 18.

Chart 20

**CHANGE IN REAL PRODUCER PRICES OF MAJOR EXPORT AND FOOD CROPS IN
SELECTED SUB-SAHARAN AFRICAN COUNTRIES
BETWEEN 1981-1983 AND 1992-1994**

(Percentages)

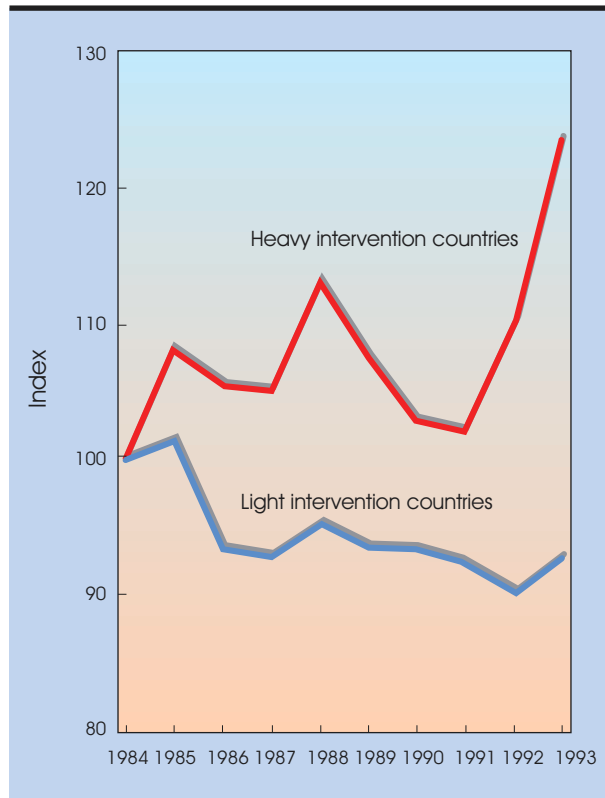


Source: UNCTAD secretariat calculations, based on data from FAO, FAOSTAT database; and IMF, *International Financial Statistics*.

Chart 21

**DOMESTIC TERMS OF TRADE OF AGRICULTURE
AND POLICY ORIENTATION OF SSA
COUNTRIES BY COUNTRY
GROUPING, 1984-1993**

(Index numbers, 1984 = 100)



Source: UNCTAD calculations, based on World Bank, *World Development Indicators 1997* (CD-Rom).

Note: Data are unweighted averages of countries classified according to their degree of market intervention (see text). Heavy intervention countries are Burkina Faso, Cameroon, Côte d'Ivoire, Ghana, Kenya, Madagascar, Senegal, United Republic of Tanzania and Zambia; light intervention countries are Burundi, Chad, Malawi, Mali, Nigeria, Rwanda and Uganda. The domestic terms of trade of agriculture are measured as the ratio of the implicit sectoral deflator for agriculture to that for manufacturing or industry.

4. Implications

The findings of the foregoing subsections are cause for concern. First of all, they suggest that the assumptions about agricultural pricing policies in the 1970s which underlie the subsequent reforms are not entirely valid. It is true that the African governments which depended on export

crops allowed their currencies to appreciate in the 1970s, and this was a handicap for African agriculture. However, while producers of certain export crops indeed faced heavy taxation, the margins between export prices and producer prices were not always higher for African than for non-African producers. Nor is it true that the entire agricultural sector was always subject to falling real prices, either for food crops or for export crops.¹²

The findings also suggest that the pricing reforms of the 1980s and the market liberalization and privatization of the 1990s have generally been associated with falling real producer prices for export crops. The domestic terms of trade have apparently turned against farmers more in those countries which have sought to link domestic and world prices. The shift from public to private marketing agents has not increased the proportion of export prices passed on to producers.

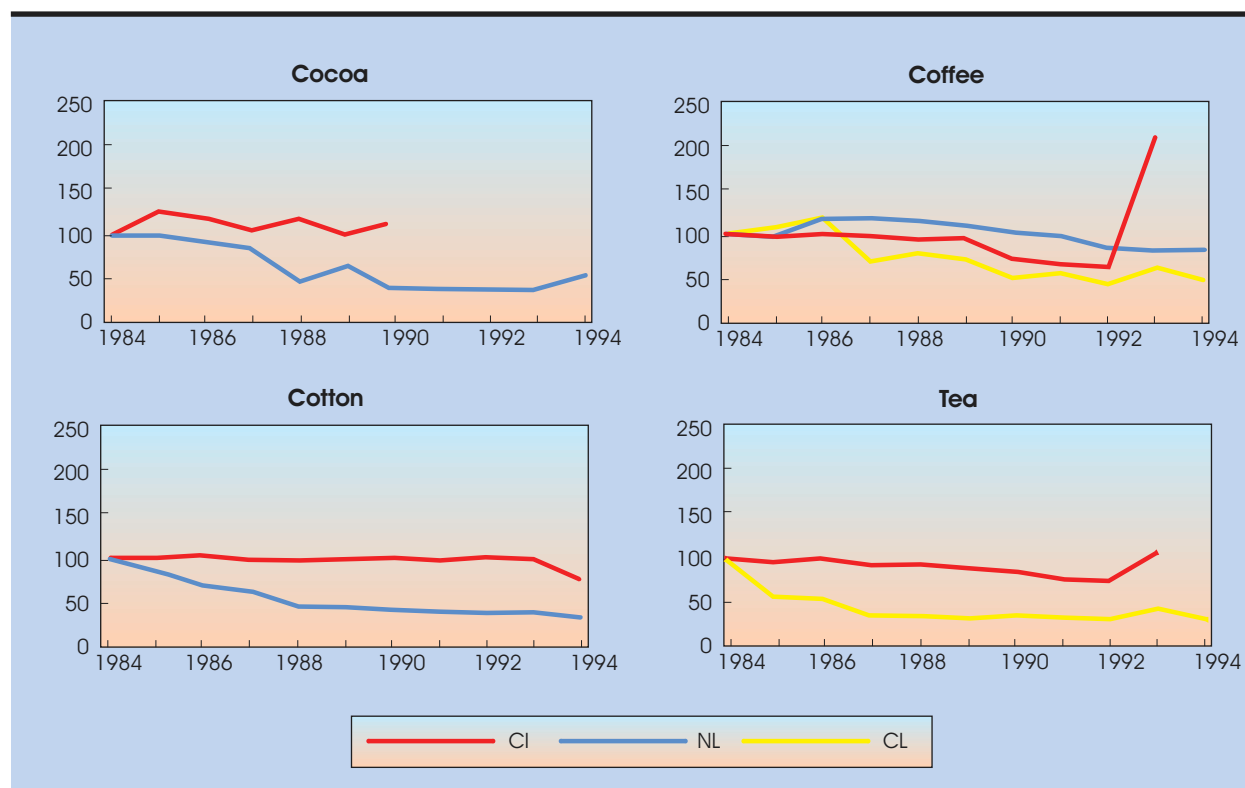
Local studies of prices of specific commodities can no doubt refine the general features identified here. However, the dynamics of agricultural price formation and the problems facing reformers and export crop farmers cannot be properly understood in the national context alone. When world prices and real producer prices for agricultural commodities are rising, there is scope for surplus extraction without undermining incentives and production. When international prices and real producer prices for agricultural commodities are falling, it would be difficult for public marketing agencies to impose an additional squeeze on farmers through forward market linkages, i.e. by higher margins between border and producer prices. In a sense, low taxation may have been an inevitable response to adverse global conditions.

Competition among traders should limit the scope of surplus extraction from farmers. In particular, the lifting of institutional restrictions on marketing can benefit farmers in more accessible and high population density areas. However, whether liberalization is an appropriate approach to agricultural development in a situation of missing and imperfect markets, adverse global conditions and poor infrastructure is very questionable. One close observer of African agriculture has argued that "donor emphasis on precipitating market liberalization in the short run may well set back the cause of market development".¹³ Policies formulated without paying attention to the characteristics of domestic market structures and constraints and global conditions court failure.

Chart 22

REAL PRODUCER PRICES FOR SELECTED COMMODITIES, AND POLICY ORIENTATION OF SSA COUNTRIES BY COUNTRY GROUPING, 1984-1994

(Index numbers, 1984 = 100)



Source: UNCTAD secretariat calculations, based on FAO, FAOSTAT database; and IMF, *International Financial Statistics* (tapes).

Note: Real producer prices are nominal prices received by farmers deflated by the consumer price index. Countries are classified according to their degree and history of market intervention (see text). The country groupings are: NL = newly liberalized; CI = continued intervention; CL = continued liberalization. Averages are unweighted and include the following countries: *Cocoa*: CI: Ghana; NL: Cameroon, Côte d'Ivoire. *Coffee*: CI: Rwanda; CL: Kenya; NL: Burundi, Côte d'Ivoire, Madagascar, United Republic of Tanzania. *Cotton*: CI: Burkina Faso; NL: United Republic of Tanzania. *Tea*: CI: Burundi, Rwanda; CL: Kenya.

C. Agricultural supply behaviour: Sources and constraints

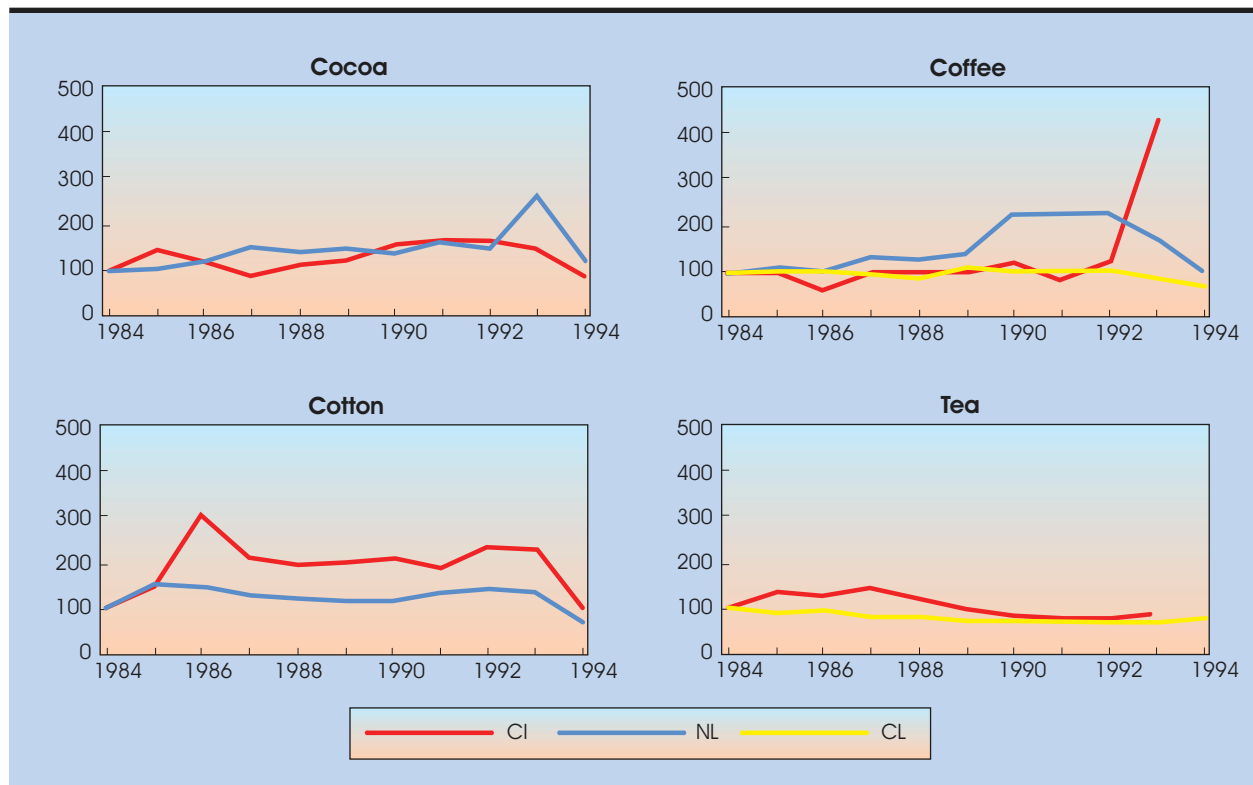
The response of agricultural production to price incentives depends on a host of structural and institutional factors influencing productivity and profitability. Empirical analyses generally suggest that the aggregate supply response of producers to price incentives is weaker in low-income countries, and show that:

... the magnitude of supply response to economic reforms depends on the degree to which

the agricultural economy is developed. Adequate rural infrastructure (irrigation, roads and transport, power, telecommunications), credit, market information, recurrent inputs, research, extension and farmer education and health are necessary for agricultural development. If these are seriously deficient, even getting the prices right in an ideal enabling environment will not suffice to develop agriculture.¹⁴

RATIO OF PRODUCER PRICES TO BORDER PRICES^a FOR SELECTED COMMODITIES, AND POLICY ORIENTATION OF SSA COUNTRIES BY COUNTRY GROUPING, 1984-1994

(Index numbers, 1984 = 100)



Source: See chart 22.

Note: See chart 22. The country grouping is as in that chart, with the addition of Uganda (coffee, NL), Chad and Mali (cotton in both cases NL).

a Export unit value.

In SSA weak supply response to price incentives used to be attributed to a lack of motivation and the allegedly perverse economic rationality of African farmers, particularly smallholders. These colonial stereotypes have been swept away by research which has shown that African producers have the same keen sense of costs and returns as farmers throughout the world.¹⁵ But at the same time, it has become increasingly evident that structural and institutional constraints are particularly tight for African producers.¹⁶ These constraints include inadequate basic infrastructure; missing or imperfect markets for output, land, labour and credit; supply problems for agricultural inputs and basic consumer goods purchased by farmers; lack of appropriate technological packages; gender relations; and high levels of risk.

1. Short-run supply response

The way in which these constraints work can best be understood by isolating the main agricultural supply processes. In the short run, aggregate supply response to price incentives can occur through three basic processes. First, idle land and labour can be brought into use, leading to an expansion in output through a “vent for surplus” mechanism.¹⁷ Second, price incentives may lead to efficiency gains resulting from reallocation of resources and changes in the output mix. Third, intensification of production can occur through the application of more variable inputs and through greater care and attention at all stages of the production cycle. Different factors enhance or constrain the efficacy of each of these processes.

(a) *“Vent for surplus”*

Production may be expanded when farm households make a greater effort and bring idle land into use in response to price incentives or greater availability of incentive goods. This mechanism is of historical importance in Africa, and has been widely used to explain the initial surge in newly introduced export crops – coffee, cotton, cocoa, groundnuts and palm nuts – which occurred with the first wave of globalization at the turn of this century. It is likely that part of the short-run supply response to policy reforms was due to “vent for surplus” effects. There was a widespread tendency among commercially oriented smallholders in a number of SSA countries in the early 1980s to reduce their marketed output because of the unavailability of such consumer goods as soap, textiles, matches, tea, coffee, sugar, cooking oil, tinned milk, fish, cement, metal roof sheeting, radios and bicycles, due to foreign exchange shortages and the collapse of the domestic manufacturing industry. The negative effects of such shortages on recorded market output have been extensively studied in Ghana, Madagascar, Mozambique and the United Republic of Tanzania.¹⁸ When trade liberalization, import expansion, reform of the exchange rate policy and the dismantling of price controls made incentive goods less scarce in rural areas, productive capacity was brought back into use.

However, there are limits to such expansion. First, it is a one-off response. As a World Bank report on the United Republic of Tanzania remarked, agricultural growth during 1983-1990 was “a one-time phenomenon associated with a return to a market-clearing situation in the rural economy that cannot be expected to sustain growth in the 1990s”.¹⁹ Secondly, there may not always be unutilized resources. In both high and low population density countries, the land tenure system means that there are pockets of high-density settlement alongside low-density areas where the entry of outsiders into the local community can be limited or fraught with social problems. Even where there are community land resources available, poorer farmers simply cannot farm extra land because they cannot mobilize the necessary complementary inputs. High levels of poverty mean that “farmers in most of SSA cannot afford to keep either their labour or land idle even at very unattractive prices”.²⁰ Nevertheless, because part of their basic consumption needs are market-mediated, falling real producer prices can cause already hard-working

farmers to work even longer hours simply to sustain minimal subsistence. For the richer farmers, what is important is the thinness of rural markets for wage labour, which makes it difficult to hire extra labour.

An important part of the total labour in agriculture is provided by women, and time allocation studies show a strong gender dimension to household labour constraints. Women, who are responsible for directly productive agricultural work as well as for maintaining the household and reproduction, have heavy work burdens. This situation is not simply due to cultural norms, but is closely associated with lack of infrastructure and transport means, with much time being spent in fetching water and firewood, and carrying goods.²¹ Also, both men and women are affected by morbidity (sickness), which reduces production and productivity; and evidence shows that the distance of the rural population from health facilities reduces their use and leads to increases in the number of days lost through illness.²² When there has been a switch from food crops to export crops, inadequate nutrition can constrain supply response. As a World Bank report on Malawi observed, the “nutritional implications of extensive switching of production away from non-tradable food crops into export crops have impeded adjustment”.²³

(b) *Output mix adjustment*

Three main factors influence the ability of farmers to achieve efficiency gains through a reallocation of resources. The first is the level of capitalization of farm operations. In semi-arid Africa the key element for farmers is animal traction (oxen or a donkey with a plough), which allows households not only to cultivate more land and enhance yields, but also to have greater flexibility in reorienting production. Micro-analysis of recent supply behaviour in Burkina Faso shows that farm households responded positively to increases in the prices of cotton and maize, two key cash crops. By contrast, increased prices for these crops led to a decrease in aggregate supply for farmers limited to hoe cultivation, because cotton and maize demand more labour than millet and sorghum.²⁴

The second factor, which limits changes in output mix, is the commitment of households to meet part of their subsistence needs through their own production. This behaviour results from the fact that the rural food markets are thin, food prices in rural markets are highly volatile, and there are large margins between rural producer

prices and consumer prices. The opportunity cost of export crop production is thus the retail price of food in rural markets. As a consequence, poor farmers tend to grow food crops with low risks and low returns. It makes economic sense to meet household food needs through one's own production, even though shifting to export crops appears to be more rational. Evidence shows that "consumer prices for staple food must fall by 5-30 per cent to stimulate cash cropping incentives in most grain deficit areas of Zimbabwe".²⁵

The third factor is gender relationships, which can reduce the flexibility of household units to reallocate resources. The rigidity of the gender division of labour in Africa is now perhaps over-accentuated, but it is certainly true that asymmetries in the provision of household labour and the control of income from specific crops and plots of land significantly reduce flexibility. A typical example is the adoption of rice production in northern Cameroon, where income from rice sales is controlled by men. It has been shown that many women preferred to work on subsistence crops even though returns from rice cultivation were higher.²⁶

(c) *Agricultural intensification*

Another form of response to price incentives – agricultural intensification – can either be labour-based or involve both additional labour and other variable inputs such as organic and chemical fertilizer on a given unit of land. The observation that the transition from extensive slash-and-burn production methods to intensive farming techniques occurs with rising population density has led to the suggestion that intensification is constrained by low population density and the consequent lack of inducement to intensify production. But although this process of intensification promoted by high population density may be relevant in a subsistence economy, in most current African conditions sustainable intensification requires additional capital and hence depends on assessment of profitability and risk, as well as on the availability of credit, skills and appropriate intensification packages. All of the latter can be influenced by policy and, whether market-driven or state-administered, are characterized by gender biases.

An important trend which has been observed in many African countries during the policy reform is the decline in the use of purchased inputs,

particularly fertilizers. Firstly, input prices have risen sharply with the removal of subsidies;²⁷ and secondly, fertilizer distribution systems have broken down as private traders have not adequately replaced marketing boards, particularly in supplying farmers in need of small quantities of fertilizer in remote areas. Once again infrastructure is a key constraint. There are also problems related to credit markets. The marketing boards had offered an institutional response to the problem of missing private credit markets. As they had a legal monopsony over marketed output, they could provide seasonal inputs on credit against the potential crop as collateral. Through the interlocking of input supply and output marketing a larger number of small farmers had access to both inputs and working capital. With privatization, this system of seasonal credit has broken down.²⁸

These factors have had adverse consequences so far for the maize revolution which was developing in East and Southern Africa. In the 1980s major increases in food grain production were achieved in Kenya, Zambia and Zimbabwe through pricing and market support policies which encouraged farmers to adopt hybrid maize seed, resulting from decades of agricultural research, and to increase fertilizer use. Policies included the expansion of marketing board buying stations in smallholder areas, expansion of state credit disbursed to smallholders, and subsidies on inputs. In the 1990s, however, this approach came to be regarded as fiscally unsustainable. With the dismantling of state marketing services, reduced availability of credit and rising real fertilizer prices, yields and production per capita stagnated, even when allowance is made for the adverse effects of drought. Remoter areas of large, low population density countries can be particularly affected by the policy change. The transition from pan-territorial to market pricing has reduced grain prices received by smallholders in the more remote grain-surplus areas in the United Republic of Tanzania and Zambia. In Madagascar food market liberalization has been associated with an increase in price volatility and greater regional and seasonal price dispersions.²⁹

In high-density areas, declining use of purchased inputs raises questions about the sustainability of intensification. Evidence from the Senegalese groundnut basin, for example, shows that with the abolition of fertilizer subsidies and the increasingly difficult access to fertilizer credit, aggregate annual use of fertilizer has declined from a high

of 80,000 tons in the mid-1970s to a range of 20-30,000 tons during the 1980s and 1990s. Farmers have compensated by increasing the seed per hectare, a solution that may make sense in the short term, given prevailing prices of groundnuts and fertilizer, but that will have adverse ecological consequences over the longer term.³⁰

2. Investment and productivity growth

Both the removal of various structural obstacles to agricultural supply response and long-run trends in productivity and output depend on the pace of investment and technological progress. In predominantly agricultural economies, the net agricultural surplus (i.e. the agricultural value-added minus agricultural producers' total consumption) is the major source of funding for investment both within agriculture and outside. In extreme conditions where productivity is very low, the value-added of the sector is barely sufficient to meet the basic subsistence and simple reproduction needs of agricultural producers, and there may even be insufficient surplus to maintain the natural resource base. Because of the undercapitalization of African agriculture, many African farmers are in this low-productivity, hand-to-mouth situation. In such situations there can be no agricultural growth without an external injection of resources to increase productivity.

Greater understanding of how more successful African farmers have been able to create an agricultural surplus, and of what they do with that surplus, is vital to successful agricultural policies in Africa. There is unfortunately a general lack of knowledge of private farm investment behaviour, and the general omission of this issue in policy analysis which underpins agricultural reforms has been highlighted in a recent report by the World Bank Operations Evaluation Department with regard to its own agricultural sector studies:

There is no analysis of the constraints on private sector investment in any of the reports. Nevertheless all the reports stress the need to develop an effective enabling environment that would help to induce private investment. Unlike the old public production paradigm, the new market friendly policy line depends on private investment to achieve rapid growth, in agriculture as in other sectors. In many countries, achieving

the needed rate of private investment in agriculture is a problem the Bank has not addressed in its sector work on agriculture.³¹

Smallholder farm investment is primarily founded on the surplus generated by both on-farm and off-farm activities. The absence of individual rights to land has meant that few farm households have collateral for loans from formal banking institutions. Private traders provide seasonal credit, tying their loans to purchase of crops, but this usually entails high implicit rates of interest and is likely to be avoided unless a farmer is desperate and seeking a "hungry season" loan to guarantee the survival of the household.³² Small farmers in the past had access to credit provided by marketing boards or special directed credit agencies, but with the implementation of reforms these sources started to disappear. What is more, special directed credit arrangements, which were an important component of donor lending, particularly by the World Bank, have been replaced by liberalized financial intermediation and market-based interest rates. The previous arrangements did not reach the poorest smallholders for whom they were often designed. However, available evidence on financial liberalization suggests that these reforms have also been unable to increase the volume of savings or access to credit in rural areas except by those who can offer collateral.³³

Under these conditions non-farm income has become an even more important source for on-farm investment, directly or as collateral. How non-farm earnings derived from the public and private sector wage bill can propel agrarian capital accumulation has been shown historically for Kenya.³⁴ But where urban unemployment is on the increase, such opportunities are diminishing. Moreover, whether non-farm income is reinvested in agriculture depends on a delicate balance of incentives and capital requirements. These are affected by the physical and economic environment, including infrastructure and market structures, the scale and timing of non-farm income flows in relation to farm investment needs, and intra-household distribution and control of both non-farm and on-farm incomes. The persistence of a high degree of intersectoral dualism, which is rooted in low agricultural productivity, has been only marginally affected by agricultural price reforms.³⁵

An important tendency observed in Africa amongst successful farmers is the diversification of their portfolios, using net incomes from farm-

ing to invest in trade and urban real estate, or in their children's education, rather than for expansion of agricultural production. This behaviour reflects both the relative profitability and the riskiness of investment in different sectors. Diversification of activities in different sectors results from high levels of risks associated with each of them, while shifting resources out of agriculture reflects the higher risks of agricultural operations based on climate, markets and public policy. Moreover, market price risks of agricultural activity appear to have increased as a result of deregulation of crop markets.³⁶

How customary land tenure arrangements affect incentives for private farm investment is a critical issue. According to one view, since tenure insecurity undermines investment incentives and diverts resources into unproductive litigation costs, land registration and freehold titles are necessary in order to unleash agricultural investment. However, other analyses of the effects of such land reforms indicate that "in the absence of profitable technological options, registration will have little effect on investment and productivity in agriculture"³⁷ and suggest that investments to improve land are actually increased under the indigenous tenure system because they can increase security of use rights. This debate is still open, but it is certain that the tenure system does affect the operation of rural labour and capital markets, and one legacy of the multiplication of land rights which occurred in the colonial period is that agricultural surplus and entrepreneurial energies are deployed to build up access to, and command over, land and labour resources rather than to increase their productivity.³⁸

The profitability of private investment in agriculture depends on public investment in infrastructure. This includes institutional support for specific crops (see box 6), as well as location-specific investments in safe water, electricity, health and education facilities, and also transport. The rural transport bottleneck is a particularly important constraint on private farm investment because it reduces real returns and is also a source of product market imperfections. The density of rural roads in Africa is very low, particularly when compared with Asia.³⁹ Moreover, many of the roads are in a poor state of repair because of lack of proper maintenance, motorized transport services are often in short supply and expensive, and there is a dearth of non-motorized off-road trans-

port equipment, which is particularly important for delivering produce to the first point of sale. The experience of the Northern Guinea Savanna of Nigeria, a country where the rural road network expanded by 45 per cent between 1985 and 1992, shows how rural road investment can, in association with the discovery of locally adapted hybrid varieties of maize and demonstration effects of rural development projects, facilitate expansion of food production.⁴⁰

Because of lack of data, it is not always possible to gauge how public expenditure supporting farm investment has developed under adjustment programmes. However, in many SSA countries, much of public investment expenditure in agriculture was externally financed, often in the form of integrated rural development projects, but such expenditure has been declining. From available evidence it appears that the proportion of government expenditure going to agriculture has remained under 10 per cent of total expenditure on average.⁴¹ This is a better indicator of urban bias in Africa than agricultural pricing policy.

The rate of technological change in agriculture depends ultimately on agricultural research. Most of the problems with that research, pointed out a decade ago, are still unsolved: costs of R&D in Africa are higher than elsewhere, owing in part to the fact that programmes are still largely foreign-funded, and the small size of countries and research stations, dispersion and high staff turnover impede the attainment of a "critical mass". As a result, with the notable exception of maize, "most of SSA now offers smallholders no dramatic, immediately applicable new technology that might (with adequate price incentives) safely and substantially increase the profitability of food farming over large areas. While this is so, the elasticity of total farm output to currently recommended policy changes, including price changes, can seldom be very large".⁴² These observations are probably as true to a large extent now as they were ten years ago. Evidence for 19 countries in SSA shows that real agricultural expenditures, which had been growing rapidly in the 1960s and moderately in the 1970s, ceased to grow in the 1980s and early 1990s. In 1991, the research expenditure in these countries was 0.7 per cent of agricultural GDP. However, estimates of the returns to investment in maize research indicate high annual rates of return, usually in excess of 40 per cent.⁴³

Box 6**PRICE AND NON-PRICE FACTORS IN COTTON DEVELOPMENT IN SSA**

A comparative analysis of cotton production and exports in SSA was carried out in the late 1980s for Cameroon, Kenya, Malawi, Nigeria, Senegal and the United Republic of Tanzania.¹ It illustrated the role of price and non-price factors in agricultural development, starting from the observation that there had been a clear tendency since the early 1970s for francophone African countries to perform better in cotton production and exports than anglophone countries (with the exception of Zimbabwe).

In two countries (Nigeria and the United Republic of Tanzania) price factors were found to have played a major role in determining the volume of cotton production. In both countries abnormally low relative prices of tradables favoured the production of food crops. The Dutch-disease-induced increase in labour cost in Nigeria and the dearth of consumer goods in the United Republic of Tanzania acted as further disincentives for the production of agricultural exportables.

However, apart from these extreme cases, differences in cotton production performance could not be explained by differences in the evolution of real producer prices. Rather, and particularly in the more successful countries (Cameroon and Senegal), non-price factors (including research, credit and subsidized inputs) explained most of the production increase. In Senegal, they more than compensated for the negative effect of declining producer prices.

The analysis also found that much of the difference in performance amongst the sample countries was due to institutional factors. In general, francophone countries appeared to benefit from better coordination between upstream and downstream agents in the cotton industry, thanks to the presence of the *Compagnie Française pour le Développement des Fibres Textiles* (CFDT). The CFDT improved vertical integration in the countries where it operated, and provided positive inputs in terms of professionalism, know-how and experience with technological, market and finance conditions.

As a result of this key institutional difference, a distinct high-input/high-yield technological pattern prevailed in cotton production in the francophone countries, while the anglophone ones were stuck in a low-input/low-yield pattern. Despite the relative success of the former, the CFDT-inspired approach was not immune to criticism, because it led to high production and administrative costs and to an excessive and even monopolistic focus on cotton. In the anglophone countries, on the other hand, lack of technological progress was making cotton cultivation increasingly unattractive, except as a diversification and risk-minimization strategy.

The main conclusion of the analysis was that, notwithstanding the relevance of macroeconomic and sectoral pricing policies, institutional factors had been paramount in explaining inter-country differences in cotton production growth. The unsatisfactory performance of cotton in an otherwise relatively successful economy such as Kenya underlined the importance of crop- and sector-specific institutional arrangements, often rooted in part in the colonial legacy of the various countries. The political influence of cotton producers was also important. Future priorities for cotton development were identified as follows: to strengthen research and extension systems; to eliminate input supply and finance bottlenecks; and to build institutions, including through regional cooperation and coordination.

¹ U. J. Lele, N. van de Walle and M. Gbetibouo, "Cotton in Africa: An analysis of differences in performance", MADIA Discussion Paper No. 7 (Washington, D.C.: World Bank, 1989).

D. Adjustment policies and agricultural performance

As noted in the previous chapter, agricultural production grew so slowly in the 1970s and early 1980s that output per capita was falling. For many countries, there was also a dip in agricultural export volumes. In the mid-1980s, output picked up and the downward trend in exports was reversed, but despite these improvements, agricultural production per capita has stagnated and export volumes have not yet recovered to their 1970 levels in most countries.

How these trends are related to various policies pursued under structural adjustment programmes introduced in the 1980s is difficult to ascertain since these programmes combine three elements (financing, policy design and implementation). While the reduction of agricultural taxation through output pricing and market deregulation has been at the centre of adjustment policies, the reforms have also involved a wider range of measures which have affected not only output prices, but also a host of other elements such as: prices and the availability of agricultural inputs, incentive goods and rural credit; the quantity and quality of rural transport infrastructure and transport means; the quality and costs of health and education services for farmers; agricultural research and extension systems; opportunities for and remuneration of off-farm employment; and the level of food demand. The performance of African agriculture reflects the influence of this package of measures, as well as of the external financing associated with adjustment programmes, on incentives and structural constraints on agricultural production, investment and productivity growth.

Agricultural performance is also affected by the weather, changes in international prices and external demand. It is notable that the acceleration in the growth of agricultural output and the recovery of export volumes in the mid-1980s co-

incided with a reversal in the downward trend in net resource transfers, in large part on account of substantial increases in ODA (see chapter I, chart 7). This was also associated with a shift from declining to rising import volumes.

As already discussed, reforms have not always succeeded in altering price structures as intended. They have often failed to reduce the taxation of export crops or to improve the agricultural terms of trade and real producer prices. Moreover, reforms have not effectively tackled key structural constraints which impede the acceleration of agricultural growth in many countries. It has been suggested that "SSA suffers from structural handicaps that are impossible to remove or reduce through the standard policy reform programs".⁴⁴ There are indications that some ingredients of reforms have actually aggravated constraints on the growth of smallholder production. Major exceptions to this situation are those countries where, in the past, attempts were being made to foster domestic capitalist agribusinesses or state farms. In such cases, important restrictions on smallholder choices and access to resources were removed. But elsewhere access to inputs and credit has not improved because input subsidies and public agricultural services (input provision, product distribution, credit and extension) have been reduced, and the private sector has not adequately taken over these functions. Moreover "the decline in donor support to rural development projects and integrated commodity projects was accompanied by a decline in investment in rural health, education and infrastructure facilities",⁴⁵ the more so because governments have been unwilling or unable to provide the operation and maintenance funds required to sustain investment. The decline in external aid to sub-Saharan African agriculture was very steep during 1987-1994, when it dropped from \$4,609 million to \$1,322 million (at constant 1990 prices).⁴⁶

The upturn in agricultural production and export volumes reflects greater utilization of existing resources rather than an acceleration of investment and productivity growth. Production and export expansion in the mid-1980s coincided with a recovery in external resource flows and imports. Exchange rate adjustments and trade liberalization also appear to have contributed by shifting the incentives towards exports and reducing shortages of incentive goods in the countryside. Moreover, given the declines in real producer prices and per capita incomes, it is possible that there has been a more intensive utilization of household labour.⁴⁷

Currency depreciations can be expected to cause a shift from food crops to export crops since many food crops are not tradable. Again, incentives for food production vis-à-vis export crops are weakened by the removal of subsidies and by depressed food demand due to contractionary monetary and fiscal policies. However, higher food import costs associated with devaluations at the same time encourage consumers to substitute local food for imports. The effects of devaluations on output mix between export and food crops for domestic consumption thus depend on the degree of tradability of food crops and reliance on food imports. It appears that where a currency was grossly overvalued and parallel currency markets were pervasive, exports either declined or were diverted into unofficial channels. In such cases, exchange rate adjustments supported by export promotion measures have achieved positive results in spite of the downward trend in real producer prices.⁴⁸

Table 46 compares post-1984 trends in total agricultural production, export volume and food production with average growth rates in the 1970s for three groups of countries defined according to the degree of compliance with adjustment programmes. These groups are not defined simply on the basis of pricing policies, but of their overall compliance with conditionality with regard to macroeconomic policy (fiscal deficit reduction, public expenditure levels, exchange rates, etc.), of their public sector management (including civil service reform, public expenditure reform and public enterprise restructuring and privatization), and of their private sector development (including financial sector reform, trade policy reform, regu-

latory environment, and pricing and incentives).⁴⁹ Three generalizations can be made from the table:

- First, it is apparent that for all groups of countries, the most significant change is in the volume of agricultural exports. This reflects the partial recovery from the dip of the 1970s and early 1980s and the return of exports to official marketing channels. However, the improvement in export performance is actually weakest for the good compliers.
- Second, there is little difference between the groups in terms of improvements they achieved in growth rates of total agricultural and total food production. However, this result changes when low population density countries (which are not found amongst the good compliers) are excluded. There is a clear tendency for the aggregate agricultural growth rates to be lower in the post-1985 period than in the 1970s in these countries.⁵⁰ When the sample is limited to high and medium population density countries, weak and poor compliers have a better overall performance in terms of agricultural growth.
- Third, there is a major divide between Southern and East African countries, on the one hand, and West and Central African countries on the other. In the former, the growth of agricultural output is lower in the post-1984 period than in the 1970s in both good and poor compliers, but it is markedly lower in the good compliers. For West and Central Africa it is faster in all cases, but particularly so in the good compliers. Also, in Southern and East Africa, the recovery of agricultural exports appears to be associated with a decline in the rate of growth of food production. Although drought may be part of the reason, the decline also reflects, as noted above, the immediate impact of the dismantling of the state-centred approach to expanding food grain production.

As with all exercises of this type, these results must be interpreted with caution. However, they do not provide much support to the idea that adjustment programmes have generally brought a better policy mix for tackling incentives and structural and institutional constraints across Africa.

Table 46

Country group	Average annual volume increase					
	Agricultural production		Agricultural exports		Food production	
	1970-1980	1985-1995	1970-1980	1985-1995	1970-1980	1985-1995
	(Per cent)					
Country with good compliance	1.0	2.2	-2.0	1.0	1.0	1.9
West and Central Africa ^a	0.0	3.0	-2.8	1.7	-0.0	2.6
Southern and Eastern Africa ^b	2.6	1.0	-0.7	-0.2	2.5	0.9
Country with weak compliance	1.6	2.7	-3.3	3.4	1.7	2.6
	(0.9)	(3.2)	(-3.4)	(3.7)	(1.0)	(2.9)
West and Central Africa ^c	1.8	3.4	-1.4	2.8	1.8	3.3
Southern and Eastern Africa ^d	1.4	1.4	-6.5	4.4	1.6	1.4
Country with poor compliance	1.8	2.6	-4.9	2.3	1.9	2.7
	(1.2)	(3.7)	(-4.0)	(4.8)	(1.0)	(3.4)
West and Central Africa ^e	1.6	3.0	-5.8	3.5	1.7	3.1
Southern and Eastern Africa ^f	2.2	2.0	-3.4	0.4	2.1	1.9

Source: UNCTAD secretariat calculations, based on FAO, FAOSTAT database. The classification of countries is that of World Bank, *Adjustment Lending in Sub-Saharan Africa: An Update*, Report No. 16594 (Washington, D.C., May 1997).

Note: Group averages are unweighted. Those shown in brackets exclude low population density countries (see text), asterisked below.

a Benin, Gambia, Ghana, Mali, Mauritania.

b Malawi, Mauritius, United Republic of Tanzania.

c Burkina Faso, Guinea, Côte d'Ivoire*, Niger, Togo, Guinea-Bissau*, Senegal.

d Uganda, Madagascar*, Zambia*, Zimbabwe.

e Central African Republic*, Congo*, Gabon*, Nigeria, Cameroon*.

f Kenya, Burundi, Democratic Republic of the Congo*.

E. Conclusions

Comparative analysis shows that a particularly effective agricultural development strategy in the early stages of development is a two-sided approach in which the State taxes agriculture, but at the same time counterbalances this resource outflow by making adequate investment in basic infrastructure for agricultural production, and helping to introduce a stream of innovations

needed to enhance productivity and profitability of private investment. This pattern has been identified as the main characteristic of East Asian agricultural development.⁵¹

In Africa too, before the agricultural marketing reforms, public policy aimed at a two-sided approach. But, as in the case of import-substitution

strategy in industry, there were serious problems of policy design and implementation. Many governments sought to raise revenue by taxing export crops without ploughing part of the money back into the sector to increase productivity. Instead, they concentrated on the promotion of food crop production, often subsidizing marginal areas through pan-territorial price support. A significant proportion of public expenditure in agriculture went into financial subsidies, particularly for inputs (e.g. fertilizers), credit and marketing, rather than into infrastructure investment and agricultural research to enhance agrarian capital formation and productivity growth. More important, a large share of revenues obtained from export crops went into urban consumption.

The success of market-based agricultural development in Africa requires on-farm private investment. This can occur only through a policy which increases the profitability of investment and lowers risks by providing a stable environment and removing technical and financial constraints on the capacity and willingness to invest. Agricultural reforms have not succeeded in this respect. They have sought to improve profitability through action on one side of the equation, namely through higher output prices. But in practice, because they have been implemented in the context of imperfect private markets and falling international commodity prices, they have failed to reverse the downward trend in real producer prices. The bias of agricultural policy reforms in favour of export production has also ignored the fact that for many farmers it is lower food prices and improved food

distribution systems that would encourage them to grow high-value crops.

Farmers have also been squeezed because key production and marketing costs – the other side of the profitability equation – have risen rapidly: prices of fertilizers and transport costs have soared with devaluations and removal of subsidies. Lower wages have not been much help because hired labour generally accounts for less than 20 per cent of the total labour force. The dismantling of marketing boards has increased price risks, adding to the uncertainties of rain-fed agriculture. The interlocking marketing systems centred on marketing boards which provided inputs and credit have been only partially replaced by private sector arrangements.

Analysis of supply behaviour has identified many institutional and structural constraints. Some of these, such as low population density and agro-climatic conditions, are legacies of geography and history, and out of reach of policy, at least in the short to medium term. Some, notably the gender division of labour and control of resources, can be quite intractable and give rise to complex policy decisions. But other structural constraints can be reduced through public investment in agricultural research and infrastructure, and through measures designed to increase farmers' skills, access to finance and capacity to invest. The importance of tackling these policy-based constraints is now well established by analysis and empirical evidence. Reorienting development policy in this direction will require a shift from an approach based on ideology to one governed by pragmatism. ■

Notes

- 1 *Adjustment in Africa* (Washington, D.C.: World Bank, 1994), p. 76. For an earlier formulation of this view see *Accelerated Development in Sub-Saharan Africa: An Agenda for Action* (Washington, D.C.: World Bank, 1982) and *World Development Report 1986* (Washington, D.C.: World Bank, 1986).
- 2 See, in particular, H. Binswanger, "The policy response of agriculture", in *Proceedings of the World Bank Annual Conference on Development Economics* (Washington, D.C.: World Bank, 1989), pp. 231-

258, together with comments by A. Braverman and A. Valdes and the floor discussion of the paper, pp. 259-271.

- 3 See J. Meerman, *Reforming Agriculture: The World Bank Goes to Market*, World Bank Operations Evaluation Department Study (Washington, D.C.: World Bank, 1997), p. 70.
- 4 These are indeed old questions raised as part of the criticism of the reform process described as "pricist", i.e. something that proceeds "as if correct pricing

- policy – for farm inputs, outputs, and foreign exchange – were (a) readily definable and attainable, (b) in general best approached by reducing state involvement in agricultural markets, (c) at least the most important component in, probably in most cases necessary and sufficient for, rapid and equitable agricultural growth” (M. Lipton, “Limits of price policy for agriculture: Which way for the World Bank?”, *Development Policy Review*, Vol. 5, 1987, p. 201).
- 5 Part of the empirical results discussed in this section are from K. Boratav, “Movements in relative prices in sub-Saharan Africa” (Geneva: UNCTAD, 1998), mimeo. Detailed information on the methodology and the data used can be obtained from the UNCTAD secretariat.
 - 6 For some of the more complex ways of making cross-country comparisons of agricultural taxation and problems associated with them, see M. J. Westlake, “The measurement of agricultural price distortion in developing countries”, *Journal of Development Studies*, Vol. 23, 1987; D. Byerlee and M. L. Morris, “Calculating levels of protection: Is it always appropriate to use world reference prices based on current trading status?”, *World Development*, Vol. 21, No. 5, 1993; and M. Karshenas, “Dynamic economies and the critique of urban bias”, *Journal of Peasant Studies*, Vol. 24, No. 1/2, 1996.
 - 7 The conventional claim of excessive taxation of agriculture in Africa has been questioned by J. G. Beynon, “Pricism v. structuralism in sub-Saharan African agriculture”, *Journal of Agricultural Economics*, Vol. 40, No. 1.
 - 8 See A.O. Krueger, M. Schiff and A. Valdes (eds.), *The Political Economy of Agricultural Pricing Policy*, Vol. 4, *A Synthesis of the Economics in Developing Countries* (Baltimore: Johns Hopkins University Press for the World Bank, 1991-1992).
 - 9 Both indicators have shortcomings which warrant caution in their interpretation. When GDP deflators at market prices rather than factor costs are used in estimating the overall terms of trade of agriculture, there may be inter-temporal inconsistencies in the measure of relative agricultural prices. For instance, a country may have dismantled its marketing boards and introduced explicit taxes on agricultural exports. Under those circumstances the market price measure of the agricultural GDP deflator can show an increase without any change in the prices received by producers. The estimates of real producer prices use FAO producer prices, but once again caution is needed in interpreting the data. Past FAO price series for SSA refer mostly to official prices paid by marketing boards to farmers, or to government support prices. When prices in parallel markets are higher, the official prices underestimate the prices actually received by farmers. By contrast, after liberalization, reported prices usually refer to average prices received by farmers. This may result in an overestimation of the effect of liberalization on producer prices.
 - 10 Chart 21 classifies countries into those with “heavy” and “light” intervention using an overall score of 15 in table A13 of *Adjustment in Africa* as the breakpoint, whilst charts 2.3.7.B and C use crop-specific information in table A9 of that study to classify countries as “continued interventionist”, “continued liberal” or “newly liberalized”. For other recent classifications see *Adjustment Lending in Sub-Saharan Africa: An Update*, Operations Evaluation Department Report No. 16594 (Washington, D.C.: World Bank, 1997); and K. Cleaver, *Rural Development Strategies for Poverty Reduction and Environmental Protection in Sub-Saharan Africa* (Washington, D.C.: World Bank, 1997); the latter uses a qualitative rating based on recent World Bank evaluations. To examine how different classifications can affect results, table 1 of the latter study has been taken as a check-list of the country classifications used in this section for comparing the terms of trade of agriculture under different policy regimes. The listing in that study produces three countries which fall into the market-oriented group in the present chapter (Malawi, Mali and Uganda) and three countries (Cameroon, Madagascar and Senegal) which fall into the “interventionist” category. With 1984 as the base year, the average agricultural terms of trade of the market-oriented group decline to 93 in 1995 (1984=100), whereas those of the interventionist group rise to 136.
 - 11 Tables A.9 and A.18.
 - 12 This conclusion was reached earlier by D. Ghai and L. Smith, “Food price policy and equity”, in J. W. Mellor, C. L. Delgado and M. J. Blackie (eds.), *Accelerating Food Production in Sub-Saharan Africa* (Baltimore and London: Johns Hopkins University Press, 1987), pp. 284-285. Also, it has been shown in a study of East Africa that the heavy subsidization of food crops after 1973 meant that in most countries there was no net taxation of agriculture; see U. J. Lele and L. Meyers, “Growth and structural change in East Africa: Domestic policies, agricultural performance and World Bank assistance 1963-86”, MADIA Discussion Paper No. 3 (Washington, D.C.: World Bank, 1989).
 - 13 U. J. Lele, “Comparative advantage and structural transformation: A review of Africa’s economic development experience”, in G. Ranis and T. P. Schultz (eds.), *The State of Development Economics: Progress and Perspectives* (Oxford and New York: Basil Blackwell, 1988), p. 204.
 - 14 Meerman, *op. cit.*
 - 15 Results of studies of the supply response of individual export crops to changes in the real prices of those crops indicate that for annual crops (cotton and tobacco) short-run supply elasticities generally range from 0.2 to 0.7. For tree crops (coffee, cocoa and tea), the range is lower – from 0.1 to 0.3. Long-run elasticities are generally higher, but usually less than unity; see G. Helleiner, “Smallholder decision making: Tropical African evidence”, in L. G. Reynolds

- (ed.), *Agriculture in Development Theory* (New Haven and London: Yale University Press, 1975); and N. Mamingi, "How prices and macroeconomic policies affect agricultural supply and the environment", World Bank Policy Research Working Paper No. 1645 (Washington, D.C.: World Bank, 1998).
- 16 Surprisingly, in view of its importance to the adjustment process, there is little research into the aggregate supply response of agriculture to real output prices in Africa. The main multi-country empirical study (M. E. Bond, "Agricultural supply response to prices in sub-Saharan Africa", IMF Staff Papers, Vol. 30, 1983, pp. 703-726) is now 15 years old. For a set of nine SSA countries, Bond found that price elasticity was low and only significant in two countries – Kenya and Ghana. The estimates correspond to those for other low-income countries and suggest that a 10 per cent increase in real crop prices will elicit only a 1 or 2 per cent increase in aggregate agricultural output in the short run.
- 17 "Vent for surplus" is a generic term for models of trade and growth that involve the exploitation of resources which had previously been unused because they had no economic value.
- 18 J. C. Berthélemy and C. Morrisson, *Agricultural Development in Africa and the Supply of Manufactured Goods* (Paris: OECD Development Centre, 1989); and D. Bevan, P. Collier and J. W. Gunning, *Peasants and Governments: An Economic Analysis* (Oxford: Clarendon Press, 1989).
- 19 World Bank, *Tanzania Economic Report: Towards Sustainable Development in the 1990s*, Report No. 9352-TA (Washington, D.C.: World Bank, 1991), quoted in L. Putterman, "Economic reform and smallholder agriculture in Tanzania: A discussion of recent market liberalization, road rehabilitation, and technology dissemination efforts", *World Development*, Vol. 23, No. 2, 1995, p. 315.
- 20 O. M. Ogbu and M. Gbetibouo, "Agricultural supply response in sub-Saharan Africa: A critical review of the literature", *African Development Review*, Vol. 2, No. 2, 1990, p. 90.
- 21 On the time that women spend in transport activities in rural areas, see D. F. Bryceson and J. Howe, *African Rural Households and Transport: Reducing the Burden on Women?* (Delft, Netherlands: International Institute for Hydraulic and Environmental Engineering, 1992); and I. Barwell, "Transport and the village: Findings from African village-level travel and transport surveys and related studies", World Bank Discussion Paper No. 344, Africa Region Series (Washington, D.C.: World Bank, 1996).
- 22 See Bevan, Collier and Gunning, *op. cit.*, especially chapters 13-15.
- 23 World Bank, "Report and Recommendation of the President of the International Development Association to the Executive Directors on a proposed credit of SDR 52.6 million (US \$70 million equivalent) to the Republic of Malawi for an agricultural sector adjustment programme", Report No. P-5189-MAI (Washington, D.C.: World Bank, 1990), quoted (p. 869) in J. Harrigan, "Modelling the impact of World Bank policy-based lending: The case of Malawi's agricultural sector", *Journal of Development Studies*, Vol. 33, No. 6, 1997, pp. 848-873.
- 24 K. Savagodo, T. Reardon and K. Pietola, "Mechanization and agricultural supply response in the Sahel: A farm-level profit function analysis", *Journal of African Economies*, Vol. 6, No. 3, pp. 336-377.
- 25 T. S. Jayne, "Do high food marketing costs constrain cash crop production? Evidence from Zimbabwe", *Economic Development and Cultural Change*, Vol. 42, No. 2, 1994, p. 399. See also A. De Janvry, M. Fafchamps and E. Sadoulet, "Peasant household behaviour with missing markets: Some paradoxes explained", *Economic Journal*, Vol. 101, 1991, pp. 1400-1417.
- 26 C. Jones, "Intra-household bargaining in response to the introduction of new crops: A case study from North Cameroon", in J. L. Moock (ed.), *Understanding Africa's Rural Households and Farming Systems* (Boulder, Colorado: Westview Press, 1986).
- 27 Fertilizer costs in Africa are inherently high because of high transport cost, lack of competition in distribution systems and absence of economies of scale in procurement. International comparisons show the following median nitrogen fertilizer-maize price ratios: Asia (1980-1992): 2.7; Latin America (1980-1992): 3.8; Kenya (1980-1995): 7.3; Zimbabwe (1980-1994): 6.4; and Côte d'Ivoire (1980-1992): 5.4; see P. W. Heisey and W. Mwangi, "Fertiliser use and maize production", in D. Byerlee and C. K. Eicher (eds.), *Africa's Emerging Maize Revolution* (Boulder, Colorado, and London: Lynne Rienner, 1997), table 13.3. These ratios have been exacerbated by the failure to reduce import barriers; see D. Gisselquist, "Import barriers for agricultural inputs", UNDP-World Bank Expansion Program, Occasional Paper No. 10 (Washington, D.C.: World Bank, 1994).
- 28 See C. Poulton, A. Dorward and J. Kydd, "The revival of smallholder cash crops in Africa: Public and private roles in the provision of finance", *Journal of International Development*, Vol. 10, No. 1, 1998, pp. 85-104.
- 29 T. S. Jayne and S. Jones, "Food marketing and pricing policy in Eastern and Southern Africa: A survey", *World Development*, Vol. 25, No. 9, 1997, pp. 1505-1527; and C. B. Barrett, "Liberalization and food price distributions: ARCH-M evidence from Madagascar", *Food Policy*, Vol. 22, No. 2, 1997, pp. 155-173.
- 30 V. Kelly, B. Diagana, M. Gaye, T. Reardon and M. Sene, "Have structural adjustment programs compromised efforts to intensify sustainable African agricultural production: Empirical evidence from Senegal", paper presented to the Meeting of the International Association of Agricultural Economists, Sacramento, California, August 1997. See also T. Reardon et al., "Promoting sustainable intensification and productivity growth in Sahel agriculture

- after macroeconomic reform”, *Food Policy*, Vol. 22, No. 4, 1997, pp. 317-327.
- 31 Meerman, *op. cit.*, p. 156.
- 32 For a full discussion of rural financial markets in least developed countries, including policy implications, see UNCTAD, *The Least Developed Countries 1997 Report* (United Nations publication, Sales No. E.97.II.D.6), New York and Geneva, 1997.
- 33 See B. M. Desai and J. W. Mellor, “Institutional finance for agricultural development: An analytical survey of critical issues”, *Food Policy Review*, No. 1, 1993; W. G. Donovan, “Agriculture and economic reform in sub-Saharan Africa”, AFTES Working Paper No. 18, 1996, chapter 8; M. K. Nissanke, “Financing, enterprise development and export diversification in sub-Saharan Africa” (Geneva: UNCTAD, 1998), mimeo; P. Mosley, “Micro-macro linkages in financial markets: The impact of financial liberalization on access to rural credit in four African countries”, paper presented to the meeting of the UNU/WIDER Project on Impact of Liberalization on Key Markets in Sub-Saharan Africa, Addis Ababa, March 1998.
- 34 G. Kitching, *Class and Economic Change in Kenya* (New Haven: Yale University Press, 1980). See also T. Reardon, E. Crawford and V. Kelly, “Links between non-farm income and farm investment in African households: Adding the capital market perspective”, *American Journal of Agricultural Economics*, Vol. 76, No. 5, 1994, pp. 1172-1176.
- 35 For a detailed discussion of trends in the ratio of value-added per worker in agriculture and non-agriculture during the reform period, see M. Karshenas, “Capital accumulation and agricultural surplus in Africa and Asia”, paper prepared for the UNCTAD project on African Development from a Comparative Perspective (Geneva: UNCTAD, 1998), mimeo.
- 36 See Barrett, *op. cit.*
- 37 R. Barrow and M. Roth, “Land tenure and investment in African agriculture”, *Journal of Modern African Studies*, Vol. 28, No. 2, 1990, p. 296.
- 38 For overviews of the debate, see H.W.O. Okoth-Ogendo, “Agrarian reform in sub-Saharan Africa: An assessment of State responses to the African agrarian crisis and their implications for agricultural development”, in T.J. Bassett and D.E. Crummev (eds.), *Land in African Agrarian Systems* (Madison, Wisconsin: Wisconsin University Press, 1993); J.-P. Platteau, “The evolutionary theory of land rights as applied to sub-Saharan Africa: A critical assessment”, *Development and Change*, Vol. 27, 1996, pp. 29-86; E. Sjaanstad and D.W. Bromley, “Indigenous land rights in sub-Saharan Africa: Appropriation, security and investment demand”, *World Development*, Vol. 25, No. 4, 1997, pp. 549-562. On the view that diversity of claims leads to inappropriate deployment of surplus, see S. Berry, “No condition is permanent” (Madison, Wisconsin: University of Wisconsin, 1993), mimeo.
- 39 In the early 1990s, for example, a group of 18 countries in the humid and sub-humid tropics had only 63 kilometres of rural roads per 1,000 square kilometres. Taking account of population density difference, this was less than one sixth of the level in India in 1950; see D.S.C. Spencer, “Infrastructure and technology constraints to agricultural development in the humid and subhumid Tropics of Africa”, Environment and Production Technology Division Discussion Paper No. 3 (Washington, D.C.: International Food Policy Research Institute, 1994).
- 40 J. Smith et al., “The role of technology in agricultural intensification: The evolution of maize production in the Northern Guinea Savanna of Nigeria”, *Economic Development and Cultural Change*, Vol. 42, No. 3, 1994, pp. 537-554.
- 41 M. Gallagher, “Government spending in Africa: A retrospective of the 1980s”, *Journal of African Economies*, Vol. 3, No. 1, 1994.
- 42 M. Lipton, “The place of agricultural research in the development of sub-Saharan Africa”, *World Development*, Vol. 16, No. 10, 1988, p. 1231. Thirtle et al. found empirical evidence in favour of the need for critical mass, showing that large countries appear to fare better than small ones, possibly because of the existence of scale economies in R&D (C. Thirtle, D. Hadley and R. Townsend, “Policy-induced innovation in sub-Saharan African agriculture: A multilateral Malmqvist productivity approach”, *Development Policy Review*, Vol. 13, 1995, pp. 323-348). If this finding were confirmed, it could contribute to explaining the good performance of Nigeria’s domestic-market-oriented agriculture.
- 43 For an analysis of agricultural research expenditures, see P. Pardey, J. Roseboom and N. M. Beintema, “Investments in African agricultural research”, *World Development*, Vol. 25, No. 3, 1997, pp. 409-423. Estimates of rates of return to maize research are from D. Byerlee and D. Jewell, “The technological foundation of the revolution”, in Byerlee and Eicher (eds.), *op. cit.*
- 44 Y. Hayami and J.-P. Platteau, “Resource endowments and agricultural development: Africa vs. Asia”, paper prepared for the IEA Round Table Conference on “The Institutional Foundation of Economic Development in East Asia”, Tokyo, 16-19 December 1996, p. 34.
- 45 Cleaver, *op. cit.*, p. 23.
- 46 FAO, *Investment in Agriculture: Evolution and Prospects* (Rome: FAO, 1996), table 8.
- 47 A number of researchers have pointed to cases of positive supply response of peasant farmers to declining producer prices and the rising costs of inputs, which has taken the form of more intensive use of household labour and compression of household consumption. Empirical evidence is provided for Brazil (F. Contre and I. Goldin, “L’agriculture en période d’ajustement au Brésil”, *Revue Tiers-Monde*, Vol. XXXII/12, April-June 1991), for Turkey (K. Boratav, “Inter-class and intra-class relations of distribution under structural adjustment: Turkey during the 1980s”, in T. Aricanli and D. Rodrik (eds.), *The*

- Political Economy of Turkey*, (Basingstoke, UK: Macmillan, 1990)), and for the United States during the Depression years (H. Friedmann, "World market, State and family farm: Social bases of household production in the era of wage labor", *Comparative Studies in Society and History*, Vol. 20, No. 4, 1978). Such behaviour could help explain post-1985 productivity improvements in Africa in conditions of adverse price movements.
- 48 Recent research on 13 sub-Saharan African countries in the 1980s which compares export responses to currency depreciations in situations with different parallel currency premiums shows that "official depreciations which were preceded by relatively large exchange misalignment and were accompanied by a reduction in the latter, as proxied by the currency premium, exerted roughly twice as much positive effect on real exports as other official depreciations" (Z. Yiheyis, "Export adjustment to currency depreciation in the presence of parallel markets for foreign exchange: The experience of selected sub-Saharan African countries in the 1980s", *Journal of Development Studies*, Vol. 34, No. 1, 1997, pp. 111-130).
- 49 World Bank, *Adjustment Lending in Sub-Saharan Africa: An Update*, Operations Evaluation Department Report No. 16594 (Washington, D.C.: World Bank, 1997). In the present analysis, the following countries are excluded from the sample because of the effects of social unrest: Chad, Mozambique, Rwanda, Sierra Leone and Sudan, and also Sao Tome and Principe.
- 50 When countries are classified in terms of high, medium and low population densities, according to the classification of H. Binswanger and P. Pingali ("Technological priorities for farming in sub-Saharan Africa", *World Bank Economic Research Observer*, Vol. 3, No. 1, 1988), which takes account of agro-climatic potential, it is apparent that agricultural growth rates declined or were stagnant between the 1970s and the post-1985 period in 8 out of 10 low-density countries, 4 out of 11 medium-density countries and 3 out of 11 high-density countries.
- 51 J. Teranishi, "Sectoral resource transfer, conflict and macro-stability in economic development: A comparative analysis", in M. Aoki, H. K. Kim and M. Okuno-Fujiwara (eds.), *The Role of Government in East Asian Development: A Comparative Institutional Analysis* (Oxford: Clarendon Press, 1997).