

Tanzania's Cotton Sector: Constraints and Challenges in a Global Environment

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Abstract

Cotton is Tanzania's largest export crop after coffee. Most cotton is exported, contributing \$90 million to export earnings. Labor is the major input: cotton provides employment to 500,000 rural households. Use of other inputs is limited.

Before 1990 most cotton marketing and trade were handled by cooperative unions and the Tanzanian Cotton Board. Reform began slowly in 1990, with the biggest step coming in 1994 when the government eliminated the monopoly held by the board and unions and allowed competition in marketing and ginning. The reforms increased the producer's share of export

prices, but official statistics show no evidence of a supply response. While ginning capacity and marketing efficiency increased considerably, the quality of cotton declined.

Several issues still need to be addressed. The tax code could be simplified, and taxes substantially reduced. Taxes could also be consolidated and rationalized, making taxation of export crops and merchandise exports more uniform. Better data are needed, along with better dissemination of information. More investment in railroad service, Mwanza's road network, and multiplication of the new seed variety would also help the sector.

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1. INTRODUCTION

Cotton is Tanzania's largest export crop after coffee. It contributes about \$90 million to export earnings and provides employment to about half a million rural households.

Cotton is produced primarily by smallholders on farms of 0.5 to 10 hectares (the average is 1.5 hectares). Most cotton growers do not use fertilizer or other chemicals, mechanized (or even animal) power, or irrigation. More than 90 percent of cotton is produced south of Lake Victoria in the Mwanza, Shinyanga, Mara, Tabora, Kigoma, and Singida regions, with Singida, Mwanza, and Shinyanga accounting for 80 percent of it; the rest is produced in the Eastern part of the country.¹ In the last five years Tanzania's cotton output has averaged about 60,000 tons, 0.3 percent of world output of 20 million tons.

Before the 1990s the Cotton Board and the cooperative unions handled all marketing services for the industry, including the provision of seed and other inputs. In reforms introduced in 1990 the Cotton Board provided fee-based service to the cooperative unions instead of buying the cotton itself. In 1992 price controls were relaxed, and indicative prices were announced instead of prices at which cotton was purchased. The biggest change came with the Cotton Act of 1994, when the government eliminated the monopoly held by the Cotton Board and the unions and allowed competition in cotton marketing and ginning.

This paper examines the causes of the poor performance of the Tanzania cotton sector. It evaluates policy reform initiatives and explores alternative measures in the context of the world market. It also considers public sector investment opportunities for cotton.

2. A BRIEF HISTORY OF THE COTTON INDUSTRY IN TANZANIA

Cotton was introduced to Tanzania around 1904 by German settlers as a plantation crop, but the attempt failed. During the 1920s new efforts focused on smallholder production, first in Eastern and later in Western Tanzania. Production of cotton on a commercial scale started at Ukiriguru, south of lake Victoria, following the construction of the railway line from Tabora to Mwanza in 1928. Because the first cotton varieties (imported from the United States) were not appropriate to local growing conditions, yields were low. Local research during the 1930s led to the development of a local pest-resistant variety. Cotton output, especially in Western Tanzania, rose considerably with the releases of these local varieties, along with better organization of the sector following establishment of the Tanganyika Lint and Seed Marketing Board in

1956.² By 1966 Tanzania's cotton output was 80,000 tons, or 0.75 percent of world production of 10.7 million tons.

A turning point came in the 1960s following the spread of the cooperative movement and deterioration of relations between ginneries owners (mostly Asians) and cotton growers. Several hundred primary societies had sprung up, and the groups began handling crop purchasing (see box 1 for the structure of a typical primary society.) Soon, they formed cooperative unions and began building ginneries, training staff, and taking over ginneries and cotton oil mills from foreign owners. The conditions of sale or transfer of ginneries are not clear, however. A government report (1999b, p. 13) put it as follows:

Until the early 1960s, the ownership and management of ginneries in Tanzania remained in the hands of the private sector. Although, due to competing forces basically from primary societies and cooperative unions on the procurement and marketing of cotton, the private entrepreneurs were compelled to sell their ginneries to them. By 1968, almost all ginneries were bought by the cooperative unions thus not only controlling the ginning but also the sale of cotton in the country. Throughout the 1970s and 1980s, there has not been much changes on the ownership of the ginneries until the 1990s when government initiated the trade liberalization.

By 1968 the unions and the Cotton Board had effectively been handed a monopsony in cotton seed buying and a monopoly in cotton lint selling. Not surprisingly, they soon became large bureaucracies and failed to pay adequate attention to the needs of the sector. The unions were employing an estimated 1,800 permanent staff and 7,000 casual laborers. The Nyanza Cooperative Union alone, with its 13 ginneries, employed 776 permanent ginneries staff and 3,000 laborers; the Shinyanga Region Cooperative Union employed 560 permanent staff and 2,000 laborers (Government of Tanzania 1999b, p. 13).

In an attempt to correct the inefficiencies and poor management, the government abolished the unions in 1976 and turned over cotton marketing to the Tanzanian Cotton Authority, the successor of the Lint and Seed Marketing Board. The government set the prices paid to farmers, establishing uniform national prices for an entire season. This marketing structure also failed, and the cooperative unions were reinstated between 1980 and 1984. The unions and primary societies acted as agents for the Tanzanian Cotton Marketing Board, the renamed Tanzania Cotton Authority. The primary societies stored and sold cotton to the cooperative unions for a fixed price, and the unions processed the seed cotton for a fixed margin. The Cotton Board managed domestic and international sales. Because the cooperative unions were semipublic entities, they simply added another bureaucratic layer rather than making a substantial contribution to value added. Most of the unions accumulated huge debts and managed

to survive only through government subsidies and donor support. (Box 2 describes the problems the unions were facing.) Both production and yields suffered. Of African producers, only Uganda had lower yields than Tanzania (table 1).

The evolution of the cotton sector is vividly summarized in an evaluation report by the Netherlands Development Cooperation (1994):

A striking characteristic of the cotton sector in Tanzania has been its institutional instability during the past forty years. Far-reaching institutional reforms have regularly been imposed. The history of cotton sector institutions shows an almost constant struggle among four forces: cotton growing farmers, cooperatives, private ginnery owners and the state bureaucracy. In addition, the ruling political party became involved in the struggle when it attempted to shape cotton sector institutions along ideological lines in the transition towards a socialist economy (p. 319) ... In fact, cooperatives became part of the political structure, and a network of bureaucrats, party officials and cooperative leaders cultivated their interests, usually to the detriment of the growers (p. 321).

Five years after unions were fully reinstated it became clear that policy reforms were the only feasible solution.

3. DEVELOPMENTS SINCE 1990

The first steps toward cotton reform in Tanzania were taken in 1989/90, when the government launched the Agricultural Adjustment Program. The program transferred ownership of seed cotton from the Cotton Board to the cooperative unions, and the board was converted into a fee-based marketing service for final sales and input purchases. Price controls on cotton were gradually relaxed. In 1991/92 the government announced only indicative prices, not fixed prices. The cooperative unions were free to determine their own producer prices for the next season, although they chose to offer uniform prices throughout the country.

The largest reforms came with the Cotton Act of 1994, when the government formally eliminated the monopoly held by the board and the cooperative unions and allowed competition in cotton marketing and ginning. At the time there were 14 regional cooperative unions licensed to trade cotton. In 1994/95 some 22 private companies started trading cotton, and 8 new private ginneries were constructed. That opened up another marketing channel, especially in Western Tanzania. In Eastern Tanzania, where production was low and some farmers had no buyers, the Tanzanian Cotton Lint and Seed Board (the new name of the Tanzania Cotton Marketing Board as of 1995) acted as buyer of last resort.

By 1996/97 private businesses were purchasing almost half of all cotton. Private traders and ginneries were able to capture a considerable share of the market because

they offered higher prices than cooperative unions and paid promptly. Some private ginneries also engaged in contract farming, providing inputs (seeds and occasionally fertilizer) to producers who agreed to supply cotton in return. The ginneries and producers usually established a minimum price at planting time, but the price could be adjusted if the market price was higher during the harvest.³

Growers Receive Higher Share of Export Prices but Pay More for Inputs

A principal argument for policy reform in the cotton sector was the enormous gap between world prices and the prices received by Tanzanian producers. During the six seasons prior to the reforms, the average grower's share was 41 percent of the cotton export price (table 2 and figure 1). In the six seasons after the reform, the share was 51 percent. While a considerable improvement, it remained far below what Ugandan and Zimbabwean producers received following their own cotton sector reforms. Payments were made more promptly as well. Before the reforms, Tanzanian growers often had to wait as long as two years for payment. With inflation running at 20–30 percent a year, that meant that the value of their payments was at least halved by the delay.

The reforms also meant that input prices increased considerably. The average cost of pesticides, for instance, rose from 1,600 Tanzanian shillings (Tsh) a kilogram in 1993/94 to Tsh 5,000 in 1998/99, implying a more than 25 percent annual increase in nominal terms (Kabissa and Myaka 2000).

Supply Response Has Been Limited

A lack of reliable data makes it difficult to analyze the impact of reforms on supply, but a simple comparison before and after the reforms using International Cotton Advisory Committee data indicates that cotton output doubled (from 43,000 to 94,000 tons) in the year following the reforms before gradually dropping back to pre-reform levels (table A3 in appendix A). Output averaged 64,800 tons in the five seasons before the reforms and 66,400 tons in the five seasons after the reforms, a very moderate increase. But other data sources throw even this modest increase into doubt. Three different sources show no supply response after the 1994/95 policy changes, which is consistent with the large reduction in input use and the mixing of cotton varieties that took place after the reforms.

Different data sources aside, there is considerable variability in cotton production in Tanzania, where cotton is very price-responsive. A World Bank (1999) study found that cotton's short-run supply elasticity is unity, implying that cotton's price variability is fully translated into supply variability. This reflects the flexibility of farmers in switching back and forth between cotton and food crops.

Credit Provision Collapsed and Input Use Declined

Once input supply (mainly chemicals and seeds) and credit for purchasing inputs were no longer integrated into a single cotton marketing channel, use of inputs declined sharply.⁴ Loss of the single marketing channel pushed up the costs of marketing chemicals and led to a collapse in supply and distribution. And most farmers did not have access to credit and so could not afford to purchase chemicals at market prices.

At least two credit provision schemes have been initiated to boost input use. In 1995 the government set up the Agricultural Input Trust Fund to stimulate private trader involvement in input supply and to finance purchases by the cooperative unions (Gibbon 1999). The fund provided credit at subsidized rates. Although some unions and private traders used the fund in 1995 and 1996, low credit recovery led to the fund's demise in 1997.

In a second attempt the Cotton Board established the Cotton Development Fund during the 1999/2000 marketing season. A 3 percent levy on cotton exports is paid into a trust fund used to finance purchases of cotton seed (1.35 percent), chemicals (1.15 percent), and research and development (0.5 percent).⁵ The inputs are distributed to registered cotton producers at below market prices, with the fund making up the difference. The fund is a forced savings mechanism; no subsidy is involved. During its first season of operation, the fund paid about 75 percent of the price of inputs, producers 25 percent. In interviews industry representatives alleged that corruption was pervasive in the distribution chain and that substantial quantities of chemicals were diverted to the free market.

Similar problems plagued seed distribution. Until the 1997/98 cotton season seed distribution was handled by the unions and primary societies, which were required to retain about a tenth of the seed for free distribution, while the rest was milled for oil. Once private traders took over, the quality of seeds deteriorated and growers received far less than the required 10 percent of seeds. After the reforms at least eight new oil mills were built in Western Tanzania, increasing the region's milling capacity by almost 50 percent. This intensified competition for seed, which is why traders distributed far less than the legally required 10 percent to growers. The Tanzania Cotton Association and Cotton Board are working to improve seed distribution and working of the Cotton Development Fund.

Quality of Cotton May Have Declined

Quality deterioration is a complex issue, but there appears to be agreement that the quality of cotton deteriorated after the reforms (Government of Tanzania 1999a;

Shepherd and Farolfi 1999; Gibbon 1999). Among a host of reasons (see table 3), four stand out. First, as already mentioned, input use declined considerably. In extensive field studies during the 1997/98 season Gibbon (1999) reported that procurement of insecticides by cooperatives in the Mwanza, Shinyanga, and Mara regions fell from 0.34–0.5 million liters during 1993/94–1995/96 to about 0.23 million liters in 1996/97 and 72,000 liters in 1997/98.⁶ Second, zoning was abandoned. Under zoning, seed for planting would come from seed cotton ginned in a designated ginnery, an attempt to keep pests and diseases from moving from one area to another. The construction of new ginneries and the fierce competition among new traders led to the abandonment of zoning, thus accelerating the transmission of disease and lowering quality. Third, following reform, the cotton varieties (UK87 with UK82) developed for use in the lake and southern zones became mixed, contributing to quality deterioration.⁷ And fourth, El Niño and La Niña caused considerable damage to cotton crops during the 1997/98 and 1998/99 seasons.

The effects of two other factors sometimes put forward as causes of the decline in quality—the opening of new ginneries and the mixing of grades—are more ambiguous. While at least half the new private ginneries are of the saw type, which reportedly produces lower quality cotton, the other new roller-type ginneries produce higher quality cotton, so there should have been little net effect on quality.⁸ The effect of mixing grades is also unclear. Before the reforms cotton was marketed as either AR (high) or BR (low) grade. Following the reforms competition among new traders and excess ginning capacity led to the abandonment of grade separation, with most cotton marketed as AR. The fact that grading has not returned more than eight years after the reforms, however, implies that the market did not attach a significant premium to grade separation.

There are also at least two factors pointing to an increase in quality. First, prior to the reforms cotton had to wait in storage for as long as a year before it was sold, leading to a deterioration in quality. Since the reforms cotton sales have been expedited, as evidenced by the shorter period of trading in Northern Europe, falling from an average of 36 weeks between 1984/85 and 1993/94 to 14 weeks following the reforms. Interviews with local industry representatives corroborated the increased speed of sales. Second, prior to the reforms a large share of cotton went to the domestic textile industry. Although not documented, it is likely that lower quality cotton was consumed domestically, while higher quality cotton was exported.⁹ Since the reforms most cotton is exported. So, although the quality of exported cotton may have declined on average, it does not necessarily follow that the quality of all cotton has declined.

One quantifiable measure of cotton quality is the premium that Tanzanian cotton commands over the Cotlook A Index and its Franc zone component (see appendix A for

details). In the seven seasons prior to the reforms Tanzania's premia averaged 10.0 percent over the A Index and 10.5 percent over the Franc Zone quotations. In the seven seasons after the reforms the premia fell to 8.8 and 7.9 percent—the 1994/95 season is not reported because Tanzanian cotton was not traded in sufficient volumes in Northern Europe that season. Extending the pre-reform period to 1984/85 gives an average premium of 10.6 percent over both the A Index and Franc Zone quotations. Regardless of the period used, the premia declined very little, which is consistent with only a small decline in quality.

It is worth contrasting these numbers with the findings of the recent Cotton Sector Development Strategy of the Tanzania Cotton Lint and Seed Board (TCLSB 2002, p. 7):

Tanzania was one of the biggest producers of roller ginned cotton (30%) for which it earned a premium of up to 6 U.S. cents per pound. Another premium of 7 US cents per pound was achieved due to its cleanliness as it is hand picked. Both premiums have now been lost but are achievable if corrections are instituted in its handling. Until 1993, another 2 cents per kg premium would also be achievable if cotton was delivered to the market in the third quarter of the year. The sad story to date is that Tanzania's cotton has lost all these premiums and it is actually discounted some 10 cents per pound due to the decline in its quality.

Between 1984/85 and 1994/95 the Tanzanian component of the A Index averaged \$1.63/kg while the A Index averaged \$1.48/kg, implying a premium of 15 US cents. According to the Board's analysis, prior to 1993 Tanzania enjoyed a premium of 13 US cents per pound, equivalent to 29 cents per kilogram. Between 1995/96 and 2001/02 the Tanzanian component of the A Index averaged 1.57/kg while the A Index averaged \$1.45/kg, implying a premium of 12 U.S. cents. The Board study, however, cites a 10-cent discount per pound, equivalent to 22 cents per kilogram. To summarize, while the Board's study claims that Tanzania's cotton went from a 29-cent premium to a 22-cent discount per kilogram—a 51-cent differential—the data reported in table 4 indicate that it went from a 15-cent premium to a 12-cent premium—only a 3-cent differential.

The claim that market liberalization jeopardizes export quality has been made often in many different contexts. Gilbert and Tollens (2002) examined Cameroonian cocoa exports using monthly data from 1988 to 2001, analyzing the import unit values of cocoa imports into the European Union before and after reforms in 1994. They found no evidence of any significant quality problems arising from market reforms. Further, they concluded that “government does not need to regulate in order to ensure a normal commercial outcome ... [and] concerns about export quality should not be an issue in the continuing African market liberalization debate” (p. 29).

Ginning Capacity Increased and Marketing Improved

Before the reforms there were 34 ginneries in Tanzania, 31 of the roller type. During the first three years of the reforms 17 new private ginneries were built, 6 in Shinyanga, 6 in Mwanza, 4 in Mara, and 1 in Tanga. The new ginneries (eight of them of the saw type) were built because the cooperatives unions refused to allow private traders to gin their cotton on a contract basis, according to Shepherd and Farolfi (1999), or because the charges were prohibitive, according to a government report (1999b). The new private ginneries added some 16,967 tons of monthly capacity to the existing 19,148 tons of union capacity in the western cotton growing area (table 5). Capacity utilization was low in both the private and the union ginneries: 9,983 tons or 59 percent for the private ginneries and 6,471 tons or 34 percent for the union ginneries. A number of new cotton oil mills were also built.

During the second year of reform the private sector took over more than a quarter of cotton marketing and as of 1997/98, the Board has withdrawn completely from cotton marketing (table 6). The private sector markets almost two-thirds of cotton, and unions the rest. Entry by private traders was not problem free. In the early years of the reforms cotton marketing was disrupted in many areas. Traders in remote areas, especially in the eastern cotton growing area, paid very little for cotton, in part because farmers were unaware of market prices and in part because of high transport costs. These problems have been rare in recent seasons.

The Research Station Released a Superior Cotton Variety

The Ukiriguru research station, under the Ministry of Agriculture and Food Security, conducts nearly all cotton research for the western cotton growing area. (Research for the eastern cotton growing area is carried out at the Ilonga research station in Morogoro; the station has released two important varieties, IL74 and IL85.) The Ukiriguru station developed and released two cotton varieties, UK77 for use in the northern zone (Kagera, Mara, and Mwanza) and UK82 for the southern zone (Shinyanga and Tabora). Because the varieties were developed for the specific agroclimatic conditions of each zone, cotton yields declined when the two varieties were mixed following the 1994 reforms. Mixing may also have affected quality (see above).

Three years before the reforms the Ukiriguru station released a new cotton variety, UK91, which research data and interviews suggest is superior to both UK77 and UK82 releases and could result in higher yields.¹⁰ However, achieving the higher yields requires multiplication and release of enough UK91 to replace the older varieties and to forestall mixing with existing varieties. That, in turn, will require a concerted effort by the Cotton Board, the Ministry of Agriculture and Food Security, and the Tanzanian

Cotton Association.

The Textile Sector Collapsed

Another important development that may have affected the demand side of the cotton industry was the discontinuation of support to the domestic textile industry and its eventual collapse. Tanzania's textile industry got its start in the early 1970s as part of the government's efforts to industrialize the economy. Domestic and donor-financed investment helped a number of textile mills begin operation, and by the 1980s there were more than 30 mills with an annual capacity of almost 50,000 tons of yarn. More than 80 percent of mill capacity was under state ownership or control. At its peak the textile industry absorbed about a third of domestic cotton production.

Though appearing successful, the textile industry was kept alive only through government protection and subsidies (Government of Tanzania 1999b, p. 5). Once government support came to an end, the industry was unable to survive international competition, and all but three textile mills went out of business. Attempts have been made recently, through privatization, joint ventures, and other means, to revive the industry, but it is too early to gauge the outcome. The U.S. African Growth and Opportunity Act, which allows many African countries (including Tanzania) greater access to the U.S. market, may be another incentive for revitalizing the textile industry. The Act is also expected to increase regional demand for cotton.

4. CONSTRAINTS AND CHALLENGES

Despite the achievements to date several issues still need to be addressed. The tax code could be simplified, and taxes lowered. The state's involvement in the sector could be reduced in most areas, with the exception of seed multiplication. Better data are needed, along with better dissemination of information. Niche markets, such as organic cotton, ought to be pursued further. And on the investment side, transportation infrastructure, especially the railway system and the road network in Mwanza, must be improved.

Infrastructure Is Inadequate

By many accounts Tanzania's infrastructure is one of the poorest in the region. Most infrastructure investments ought to be assessed on an economywide rather than sectoral basis, with returns on investments in one sector compared with returns across all sectors. However, three infrastructure shortcomings severely impede the development of the cotton sector and ought to be dealt with at a sectoral level. First, because most cotton must be transported by rail, the quality of rail services is vital to sectoral performance. Greater efficiency in rail transport would lower costs to growers.

Second, the road network in the Mwanza region, where most cotton is produced, requires considerable upgrading. As with rail transport road improvements will increase efficiency and reduce costs, thereby leading to higher producer prices. Third, some public investment may be needed to accelerate seed multiplication of the UK91 cotton variety.

Taxation Is Too Complex and Taxes Are Too High

Before the reforms cotton sector taxes were administered centrally by the Prime Minister's Office in consultation with the Ministry of Agriculture and the Cotton Board. Now cotton, like all other export crops, is subject to a host of taxes, levies, and fees administered at both district and central government levels.

A government study of the tax structure in 1998/99 (Government of Tanzania 1999b) found that the tax burden on cotton was more than 13 percent of the producer price (7.7 percent for district taxes and 5.1 percent for central taxes). Local taxes include a produce assessment and education fund tax; central taxes include a Cotton Board application fee, export license fee, ginning license fee, Cotton Board fee, stamp duty, withholding tax, and export duty, for a total of 24.43 Tsh per kilogram, based on a producer price of 185 Tsh per kilogram (table 7). And there are still other fees, including the Cotton Development Fund fee and fees payable to cooperative unions and primary societies. When all fees and taxes are accounted for, the tax burden exceeds 20 percent of the price received by producers.

In addition to these direct taxes on cotton, there are sector-specific or economywide distortions that impose an even larger burden on the sector. These costs have increased enormously in the last decade. Another government report (2000) found that nominal protection rates in the sector increased from -17.9 for 1986-89 to -69.0 for 1990-93 and -67.7 for 1994-99, with the negative sign indicating taxation of the sector. Most of the outflow of resources was a result of direct interventions.¹¹

While the taxes and other levies are high, at least five studies claim that the full amounts are not being paid:

- “There seems to be some skepticism among Unions and private buyers whether everyone is paying the required levies and cesses” (Akiyama and Larson 1995, p. 5).
- “Unless they were systematically under-declaring their seed cotton purchases and/or otherwise avoiding taxation—they were entailing losses” (Gibbon 1999, p. 144).
- “The data on exports as given by various private export firms are unrealistic and in most cases they are understated to avoid some levies and taxes imposed by various authorities” (Government of Tanzania 1999b, p. 25).

- “Oppressive tax enforcement, harassment of taxpayers, and discontent with public service delivery seem to increase tax resistance and may explain widespread tax evasion” (Fjeldstad and Semboja 2001, p. 2059).
- “Most importantly, lack of transparency and accountability with regard to how such taxes are utilized by concerned authorities has been irksome. As a result of taxes accounting for up to 20% of farm -gate price, there has been rampant underreporting of purchases or even more mundane ways of tax evasion have been crafted” (TCLSB 2002, p. 13).

Although it is difficult to quantify these claims, that they come from such diverse sources adds considerable weight to the conclusion that tax avoidance or evasion is widespread.

The Cotton Board Has Too Many Roles—and Too Much Power

The Cotton Board has several roles. It regulates the industry, inspecting the quality of lint and other by-products; announces indicative prices; and collects and disseminates statistics.

The board is supposed to certify the quality of seed cotton collected at all buying posts and to inspect the variety and quality of lint at the ginneries. A lack of adequate resources severely limits these inspections, however. In practice, ginneries send samples to the board from each bale of cotton ginned, and the board simply informs ginneries if samples are deficient. Cotton is seldom inspected at buying posts. In order to be more effective the Cotton Board hired a private company which placed inspectors at every ginnery in order to monitor the quality of cotton since the 2000/01 season. These inspectors were given the right to "reject" cotton. Not only it is not clear what "rejection" means, but the quality control scheme appears not to be functional at all while it is characterized by corruption. Interviews with ginners indicated that quality inspectors would "accept" or "reject" cotton on the basis of whether a side-payment of the equivalent of \$US 30 per truck load had been made.

By statute the board is supposed to “ensure free competition, fair trade, and to set and monitor indicative prices as established by market forces” (TCLSB 2002, p. 25). For example, for the 2002/03 season, the Board along with the Tanzania Cotton Association announced that the minimum price to be paid to farmers would be 140 Tsh per kilogram. However, this is a dangerous practice. If the prevailing price is above the “indicative” price, the announcement motivates traders to collude and refuse to buy cotton at the indicative price. On the other hand, if the prevailing price is much lower than the indicative price, farmers may view the indicative price as a guaranteed price and refuse to sell their cotton at the prevailing price.

The power of the board also appears to be excessive. According to the 2001 Cotton Industry Act, “[The Board is entitled] to do anything or enter into any transaction which in the opinion of the Board is calculated to facilitate the proper and efficient carrying out of its activities and the proper exercise of its functions under the provision of this Act” (TCLSB 2002, p. 25).

The Cotton Board should withdraw from interventions in the quality and price of cotton, which ought to be the sole responsibility of the private sector. The board’s involvement in these practices simply adds one more unnecessary layer of bureaucracy. Instead, the board should focus on a few core activities, including the collection and dissemination of statistical data and seed multiplication.

Organic Cotton Is Being Produced but Not Properly Marketed

Several African cotton producing countries—Benin, Mozambique, Senegal, Tanzania, Uganda, and Zimbabwe—began to produce organic cotton in the late 1990s.¹² Some are still at an experimental stage; others are more advanced. Although Tanzania seems well suited to the production of organic cotton, because of the low reliance on chemicals and fertilizer, inspection and certification are still at an early stage. In experimental trials farmers readily accepted and produced organic cotton, but the marketing side of the experiment was less successful.

Organic cotton production in Tanzania began in the 1994/95 season. Managed by textile company CIC Limited, initial efforts involved 45 farmers who allocated 141 hectares to organic cotton. A Swiss company handled certification and supervision. Contract farmers were promised support through extension services, including provision of inputs, a guaranteed market at a premium price, and payment in cash. In the second season 110 farmers produced organic cotton on 645 hectares, harvesting 443 tons of seed cotton.

While production was deemed a success (only three farmers dropped out in the first two seasons), internal problems and changes in the textile company’s management delayed purchases of the cotton, which was eventually sold as conventional cotton, without the expected price premium. Despite the marketing failure, the number of registered farmers increased to 134 in the 1996/97 season, with the area planted rising to 778 hectares. Of the 516 harvested tons of fully certified organic cotton, only 60 percent was marketed as organic, this time by Tansales, Ltd., which took over when CIC, Ltd. went out of business.

Data Quality Is Unacceptable

The poor quality of data is a major concern, as the government acknowledged in

its review (1999a):

The [cotton] industry is also facing the problem of discrepancies of its data. Data from various sources on the same issue has been quite different. The sources of information on cotton usually are Customs, Bank of Tanzania, The Ministry of Agriculture and Cooperatives, and the TCLSB. The differences in the data could be eradicated or narrowed down through regular reconciliation by those institutions mentioned above.

Table 9 gives a sense of the data problems. It reports four sets of data on cotton production between the 1986/87 and 1998/99 seasons: one from the International Cotton Advisory Committee (ICAC) and three from the government's cotton sector review (1999a, p. 19, table 10, which draws from TCLSB; p. 32, Annex 1, which lists no source; and the Annex 4 table Cotton Production since 1922, also from TCLSB). The deviations between the three sets of government data and the ICAC figures are revealing. For the 1992/93 season, for example, the government data on page 32 of the report are 118 percent higher than the ICAC figures and the data from annex 4 are 101 percent higher. Trying to gauge the degree of supply response by comparing pre- and post-1994 averages would yield results ranging from a 15 percent reduction (annex 4 data), through reductions of 8 percent (page 19 data) and 4 percent (page 32 data), to an 8 percent increase (ICAC data).

In contrast, a comparison of four sources of data on prices received by cotton growers shows considerable agreement. Until 1994, when producer prices were the same across the country and across seasons, all sources, not surprisingly, report the same figure. But even in the post-1994 period the differences remain small.

It is interesting to note that there are remarkable similarities in producer prices, where there is considerable room for subjective judgment, and large differences in production figures, where an objective count should be possible. That adds some credibility to the claim that exporters often underreport production and exports in order to lower their tax burden. This argument gains more validity if one considers that all three domestic sources consistently report lower post-1994 average production than ICAC.

5. CONCLUSION

In some respects cotton sector reforms have been successful. Producers receive a higher share of export prices, and they receive payments on time. Ginning capacity has increased enormously. Cotton moves more quickly through the marketing chain. And while there are many reports of a deterioration in quality, there is no evidence, apart from the mixing of cotton varieties, that anything but market forces is behind the small change.

But many areas, from policy reforms to public investment, still need attention if the sector is to reach its potential.

- Taxes should be reduced substantially, the tax code simplified, taxes consolidated and rationalized, and tax rates made uniform across all exports. This more equitable distribution of the tax burden should help to induce a supply response. Lowering taxes should improve compliance and boost tax revenues.
- The Cotton Board should withdraw from activities such as quality monitoring and announcing indicative prices. Instead it should assume full responsibility for collecting and disseminating accurate statistics. That information will help to guide government policy and private sector investment decisions.
- Public investment may be needed to move quickly on seed multiplication for the new cotton variety, UK91, possibly led by the board and the Ministry of Agriculture. Research suggests that the new variety is superior to the older releases and could result in higher yields. But achieving the higher yields requires release of enough of the new variety to forestall mixing with existing varieties.
- Public investment may also be required to improve rail services and the roads in Mwanza, on which cotton is heavily dependent.

NOTES

- ¹ Cotton production is prohibited south of the Matandu river (in the Mtwara, Lindi, and Ruvuma regions) in order to serve as a quarantine zone to prevent the spread of red bollworm disease from the cotton producing areas of Malawi, Mozambique, and Zambia.
- ² Before 1956 Tanzanian cotton was marketed by the Uganda Lint Marketing Board.
- ³ On some occasions, however, private traders delayed payments to farmers, prompting the Ministry of Agriculture to issue a directive in July 1996 to revoke buying licenses if payments were not made up front (Shepherd and Farolfi 1999).
- ⁴ While it could be argued that the input supply system was functioning well as judged by low growers' default rates, the reality is that most unions dealing with sales and distribution of inputs faced severe financial stress and some eventually went bankrupt.
- ⁵ However, according to *Cotton Outlook* (June 28, 2002), the contribution to the Cotton Development Fund for the 2002/03 season was set at 10 Tsh per kilogram. With a price of 140 Tsh per kilogram of seed cotton, it would imply a 7.1 percent contribution.
- ⁶ These numbers imply that most cotton growers spray at most once. Prior to the reforms growers commonly sprayed two or three times. To achieve maximum yields, the research station recommends spraying six times (not necessarily optimal from an economic point of view.)
- ⁷ UK stands for Ukiriguru, 77 and 82 for 1977 and 1982, the years of release of the respective cotton varieties.
- ⁸ One may question the rationality of building new ginneries producing lower quality of cotton. Gibbon (1999, p. 136) reports that a high proportion of the smaller new ginneries had obtained loans at concessionary rates, mainly donor subsidized. He also reported that the buildings and equipment were second-hand (and in two cases even scrap).
- ⁹ That follows the logic that lower quality products are consumed close to the production point while quality rises the further away the consumer center. That, of course, assumes that both cotton and textiles are priced at marginal cost. For an exposition of this see the "Shipping the Good Apples Out" section (p. 345) in Silberberg (1978).
- ¹⁰ It is worth noting, however, that Gibbon (1998, p. 58) has challenged this, implicitly: "UK91 had either been introduced as a potentially universal seed for the whole WCGA, or at any rate came to be considered in Cotton Board circles to have this property."
- ¹¹ The nominal rate of protection or taxation provides a comprehensive measure of the incentives or disincentives to a particular sector from sector- and economy-wide policies, including agricultural marketing and pricing policies, exchange rate policies, import duties on manufactures, and explicit taxes on exports. The direct effects come primarily from pricing policies and include the direct and implicit taxes on export crops and the monopsonistic behavior that widens the gap between producer and export prices. The indirect effects come mainly from the impact of trade and macroeconomic policies.
- ¹² The remainder of this section is based on Ratter (1999).

BOX 1. THE PRIMARY SOCIETY OF CHAMA CHA MSINGI MEUDAMA

The primary society of Chama Cha Msingi Meudama is one of 343 members of the Nyanza Cooperative Union (NCU) serving the villages of Ngudam, with 360 families, and Nyamholomgo, with 500 families. The society, located 30 kilometers southeast of Mwanza, the second largest city in Tanzania, has 102 active members. Membership requires a one-time 200 Tsh fee and the purchase of at least one share (500 Tsh), which can be sold when a member drops out. The society purchases agricultural products, mainly cotton, and distributes input supplies. It owns one storage facility, including a scale and a safe deposit.

The society's board consists of 10 elected officials (chair, vice-chair, and eight members), who serve three-year terms. The current board is all male, but women have served in the past. Management consists of the secretary and the assistant secretary, who come from the two villages. Formerly on a full-time payroll, they are now paid on a part-time basis because of the substantial reduction in cotton production. A few paid temporary workers assist the society during the cotton season.

During the 2000/01 season society members planted close to about 325 hectares in cotton. The largest cotton farm is 4 hectares; most farms are between 0.4 and 1.2 hectares. The 91 farmers who grew cotton delivered between 250 and 500 kilograms of seed cotton to a nearby NCU-owned ginnery and were paid in cash. The society received finance from NCU, which in turn received finance from the National Bank of Commerce, a private bank, at 19 percent interest. Farmers received 150 Tsh a kilogram for their seed cotton. Private traders did not buy cotton from society members because, according to the society's chairman, farmers are loyal to the society and the low production levels are not attractive to private buyers.

Farmers also grow rice, mostly for their own consumption though some sell small quantities to private traders for the market in Mwanza. Other food crops include cassava, maize, millet, groundnuts, and potatoes. Livestock raising is also common. The villages have no tractors or trucks. All cultivation is by hand, occasionally assisted by animal power.

In an interview with four of the farmers, they identified a shortage of inputs (mainly chemicals) as a major obstacle to cotton production. By shortage, farmers meant a shortage of chemicals at the discounted price offered by the Cotton Development Fund. Chemicals were available at the market price of twice the fund price. Farmers were aware of the problem of mixing cotton varieties and the effect on yield.

When asked "What would be the one or two things that the World Bank or another aid agency could do to improve your livelihood?" farmers replied: improve the school and construct a medical facility.

Source: *Author's interview, November 10, 2001.*

BOX 2. UNIONS AND THE PRIVATE SECTOR—PERCEPTIONS AND REALITY

Cooperative union members and government officials are skeptical of the private sector's involvement in marketing and trade activities in Tanzania. Their views reflect, at least in part, 30 years of experimentation with central planning. Consider the following interview with a high ranking cooperative union official.

When asked for his views on private sector involvement in cotton marketing, he replied: "The problem with the private traders is that you cannot control them! You, as the World Bank, should support cotton to be produced. You should support the cooperative union and forget about the private sector." This thinking echoed the Arusha Declaration some 34 years earlier: "the way to build and maintain socialism is to ensure that the major means of production are under the control and ownership of the Peasants and Workers themselves through their Government and their Cooperatives" (quoted in World Bank 1977, Annex V, p. 47).

When asked what kind of assistance would be needed to overcome the difficulties the cooperative union faced, he replied: "I need finance. If I am given enough finance, I could do better." Though unstated, implicit in this response was the assumption that the loan would not be at market rates or, if a history of debt accumulation by the unions and eventual forgiveness is any guide, would not be repaid at all. Most cooperative unions have difficulty obtaining bank loans because they lack creditworthiness not because banks lack funds or they are unwilling to lend. Since banking sector liberalization, obtaining finance has not been a problem for creditworthy borrowers. The manager of a union-owned cotton oil mill, currently leased to an entrepreneur, noted that there had been no difficulty obtaining a \$340,000 loan to purchase the factory and another \$300,000 loan to rehabilitate it—a 5-year loan at 12 percent interest from a private bank.

When asked about the union's achievements prior to the reforms, the official responded: "We built all this infrastructure!" "All this infrastructure" is now insolvent and up for liquidation (a cotton oil mill), run-down or underutilized (several ginneries), or abandoned (two 2,000-hectare cotton farms).

The problems with the cooperative unions were vividly described by Gibbon (1999, p. 135): "Internal corruption, inefficiency, maintenance of loss-making non-core activities, ... over-manning, under-qualified management and outdated and poorly maintained plant ... remain largely uncorrected." This description is similar to that of a government review (1999, p. 14), which reported: "A study undertaken by the Netherlands Government in 1990, on the quality of ginnery manpower working in ginneries owned by the cooperative unions found that: most of the staff were over 45 years of age; 90 percent of them were unqualified for their posts; most ginnery managers had no formal management training; above 80 percent of the ginnery workers did not meet the required minimum qualifications and their promotions were based on experience without undergoing any further formal training." Netherlands Development Cooperation (1994, p. 335) reached remarkably similar conclusions: "Studies in 1989 and 1992 judged that financial management of the [unions] was very weak, and revealed that both the Nyanza Cooperative Union and Shirecu were insolvent. They listed serious shortcomings in accountancy practices, revealed high marketing costs, and unrecoverable bank overdrafts. In addition they mentioned that the virtual absence of members' equity had made the unions become wholly financed by government, chiefly through bank overdrafts."

More recently, *Cotton Outlook* (October 28, 2002, p. 9) reported: "A noteworthy of the [2002/2003 production] figures is the small quantity attributed to each of the two major cooperative unions. Purchases by SHIRECU and NCU are estimated at 2,648 and 1,348 tonnes, respectively. A local press report has referred to the huge debts with which NCU is burdened. The article mentions a figure of over seven billion shillings (roughly US \$7,000,000), of which 4.5 billion (US \$4,500,000) are owned to the National Bank of Commerce."

Source: Author's interview, November 9, 2001.

TABLE 1
COTTON YIELDS IN SELECTED AFRICAN COUNTRIES, 1970/71-2001/02
(KILOGRAMS PER HECTARE)

YEAR	TANZANI A	UGANDA	ZIMBABWE	SOUTH AFRICA	BENIN	MALI	CHA D	FRANC ZONE
1970/71	268	85	571	147	351	306	114	175
1980/81	111	13	459	136	231	397	188	310
1990/91	161	91	262	194	482	558	288	466
1991/92	235	55	88	157	518	531	239	415
1992/93	112	53	304	172	492	547	237	441
1993/94	125	65	261	199	439	500	234	430
1994/95	547	82	194	293	426	475	301	403
1995/96	244	87	394	304	502	504	298	437
1996/97	234	211	322	271	375	451	301	418
1997/98	129	186	334	226	397	434	275	424
1998/99	85	64	297	202	376	432	217	402
1999/2000	166	86	370	239	415	459	300	421
2000/01	174	109	370	245	413	456	320	422
2001/02	175	97	326	216	432	463	280	216
Average^a	199	99	294	277	439	484	274	408

a. Calculated over the 1990/91 to 2001/02 period.

Source: ICAC various years, *Cotton: Review of the World Situation*.

TABLE 2**PRICES RECEIVED BY COTTON GROWERS, 1988/89–2000/01**

YEAR ^b	EXCHANGE	LINT PRICE			PRODUCER PRICE		
	RATE	A INDEX	EXPORT		SEED ^a	LINT	SHARE
	(Tsh/\$)	(\$/kg)	(\$/kg)	(Tsh/kg)	(Tsh/kg)	(Tsh/kg)	(percent)
1988/89	121	1.43	1.43	173	22	67	39
1989/90	174	1.80	1.65	288	28	84	29
1990/91	207	1.84	1.66	343	41	123	36
1991/92	263	1.41	1.44	379	70	210	55
1992/93	351	1.29	1.22	429	60	180	42
1993/94	487	1.52	1.17	570	80	240	42
1994/95	539	2.02	1.69	911	120	359	39
1995/96	560	1.90	1.88	1,053	207	619	59
1996/97	600	1.73	1.59	954	170	509	53
1997/98	650	1.62	1.72	1,118	180	539	48
1998/99	750	1.33	1.22	915	185	554	61
1999/2000	800	1.16	0.99	792	123	368	46
2000/01	820	1.28	—	—	185	554	—

— is not available.

a. Converted to lint equivalent using a ginning outturn ratio of 0.334.

b. refers to marketing years (July/August).

Source: Government of Tanzania (1999b, table 5, p. 10); Kabissa and Myaka (2000); and author's calculations.

TABLE 3**QUALITY DETERIORATION AFTER 1994/95: REASONS, QUALIFICATIONS, AND PUBLIC ACTION**

REASON/EVIDENCE THAT QUALITY HAS CHANGED	HOW IT MAY HAVE AFFECTED THE QUALITY OF COTTON?	LIKELY EFFECT	PUBLIC ACTION ^a
Declining input use	Caused by removal of input price subsidies, mainly on chemicals. Any quality decline due to reduced input use reflects relative prices and hence market forces.	Negative	No
Abandoning of zoning	Prior to reforms cotton could be sold only to ginneries in a designated zone. Following the reforms, as cotton prices rose in the late 1990s, fierce competition and overcapacity in ginning caused abandonment of zoning, leading to a mixing of seeds and ultimately reducing cotton quality.	Negative	No
Mixing of UK77 and UK82 varieties	Prior to reforms different varieties of cotton were produced in the lake and southern areas, each developed for the specific agroclimatic conditions of the area. Following the reforms the two varieties were mixed, reducing quality.	Negative	Yes
Presence of El Niño/La Niña	Exogenous shocks, recurring every five to six years, reportedly affected the quality of cotton during the 1997/98 and 1998/99 seasons.	Negative	No
Construction of new ginneries	Some of the newly constructed small ginneries are of the saw type, which reportedly produce cotton of lower quality. Some of the ginneries used second-hand equipment. New large ginneries of the roller type produce higher quality cotton.	Neutral	No
Mixing of high (AR) and low (BR) cotton grades	Apart from the effects of lack of experience by new private traders in the first few years, the fact that grading did not return implies that the market did not attach a significant premium to it (i.e. the costs of grading outweigh the losses of mixing the grades.)	Neutral	No
Premium declined slightly	In the seven seasons prior to reforms Tanzanian cotton averaged a 10 percent premium over the A Index. In the seven seasons after the reforms it averaged an 8.8 percent premium.	Neutral	No
Reduced storage time	Since the reforms cotton traders and exporters have shortened the time cotton is kept in storage, slowing its deterioration.	Positive	No
Increased share of exports	Because more cotton is exported since the collapse of the textile industry, it may appear that the overall quality of exported cotton has declined. In fact, cotton of lower quality that might have been consumed domestically has just shifted destination.	Neutral	No

a. It indicates whether any public action is warranted.

Source: Government of Tanzania 1999a; Gibbon 1999; Shepherd and Farolfi 1999; and author's interviews.

TABLE 4**TANZANIA'S COTTON PREMIUM OVER THE A INDEX AND FRANC ZONE, 1984/85-2001/02**

YEAR	NUMBER OF WEEKS ^A	QUOTATION (DOLLARS PER KILOGRAM) ^B			PREMIUM (PERCENT)	
		A INDEX	FRANC ZONE	TANZANIA	A INDEX	FRANC ZONE
1984/85	35	1.58	na	1.78	12.8	na
1985/86	52	1.08	1.08	1.23	14.3	14.2
1986/87	52	1.37	1.40	1.49	9.0	7.4
1987/88	27	1.71	1.72	1.94	14.4	13.0
1988/89	34	1.33	1.34	1.52	14.4	13.9
1989/90	22	1.79	1.77	1.91	6.7	7.8
1990/91	27	1.81	1.80	1.98	8.9	9.8
1991/92	29	1.34	1.39	1.53	13.6	14.3
1992/93	52	1.27	1.25	1.37	7.8	10.1
1993/94	39	1.47	1.47	1.54	4.4	4.7
1994/95	0	na	na	na	na	na
1995/96	24	1.94	1.97	2.12	9.3	7.7
1996/97	15	1.67	1.67	1.75	4.8	4.7
1997/98	9	1.76	1.71	1.85	4.9	8.3
1998/99	13	1.43	1.47	1.62	13.4	9.8
1999/2000	14	1.08	1.10	1.22	13.6	11.2
2000/01	12	1.35	1.34	1.39	3.5	3.8
2001/02	11	0.92	0.94	1.03	12.3	10.0
AVERAGE						
1984-94	37	1.48	1.47	1.63	10.6	10.6
1987-94	33	1.53	1.53	1.68	10.0	10.5
1995-2002	14	1.45	1.46	1.57	8.8	7.9

na. is not applicable.

a. Numbers of weeks Tanzanian cotton was traded in North Europe in large volumes.

b. Calculated for number of weeks reported in first column.

Source: Cotton Outlook and author's calculations.

TABLE 5
POST-REFORM GINNING CAPACITY IN THE LAKE ZONE (TONS PER MONTH)

REGION	NUMBER OF GINNERIES		RATED CAPACITY		ACTUAL CAPACITY		CAPACITY RATIO ^a	
	UNION	PRIVATE	UNION	PRIVATE	UNION	PRIVATE	UNION	PRIVATE
MWANZA	11	7	9,557	5,681	3,387	3,375	0.35	0.59
SHINYANGA	7	6	7,350	6,907	2,357	4,235	0.32	0.61
MARA	3	4	2,242	4,379	727	2,372	0.38	0.54
TOTAL	21	17	19,148	16,967	6,471	9,983	0.34	0.59

a. Ratio of actual to rated capacity.

Source: Government of Tanzania (1999a, annex 7, p. 32). Original data from the Tanzania Cotton Lint and Seed Board (reported in bales.)

TABLE 6**POST-REFORM COTTON MARKETING SHARES, 1994/95–1998/99**

YEAR	UNIONS		PRIVATE TRADERS		COTTON BOARD		TOTAL
	TONS	SHARE (%)	TONS	SHARE (%)	TONS	SHARE (%)	TONS
1994/95 ^a	103,981	85	11,009	9	7,340	6	122,330
1995/96	162,161	70	61,841	27	6,455	3	230,457
1996/97 ^a	150,254	60	89,813	35	12,076	5	252,143
1997/98	90,174	43	116,906	56	1,075	1	208,155
1998/99	58,754	44	74,778	56	0	0	133,532

a. Data for these seasons exclude the Eastern Cotton Growing Area.

Source: Government of Tanzania (1999a, table 6, p. 11). Original data from Tanzania Cotton Lint and Seed Board.

TABLE 7

COMPOSITION OF TAXES ON COTTON, 1997/98 and 1998/99

TAX	TSH PER KILOGRAM		PERCENT OF PRODUCER PRICE	
	1997/98	1998/99	1997/98	1998/99
Export price	309.00	236.00	na	na
Producer price	202.00	185.00	na	na
Local taxes	10.10	14.20	5.00	7.68
District produce cess	6.20	9.20	3.07	4.97
Education fund	3.90	5.00	1.93	2.70
Central taxes	18.37	10.23	8.70	5.10
Board application and license fee	0.14	0.14	0.07	0.08
Export license (\$2,000, flat fee)	0.43	0.43	0.21	0.23
Ginning license (\$1,000, flat fee)	0.22	0.22	0.11	0.12
Board fee (0.8 percent of export price)	1.54	1.89	0.76	1.02
Stamp duty (1.2 percent of export price)	3.70	2.83	1.83	1.53
Withholding tax (2 percent of export prices)	6.17	4.72	3.05	2.55
Export duty (2 percent of export price)	6.17	na	3.05	na
Total taxes^a	<i>28.47</i>	<i>24.43</i>	<i>14.09</i>	<i>13.20</i>

na. not applicable.

a. Does not include the Crop Development Fund or union and primary society fees.

Source: Government of Tanzania (1998 and 1999a) and author's calculations.

TABLE 8
PRINCIPAL INSTITUTIONS INVOLVED IN THE COTTON SECTOR

INSTITUTION	ENTITY	MAIN FUNCTIONS AND RESPONSIBILITIES
Ministry of Agriculture and Food Security	Government	Supervises the sector. Acts as liaison between the sector and the legislature and provides legal and policy guidelines. Collects and disseminates statistics.
Ministry of Cooperatives	Government	Oversees and regulates the cooperative unions. Provides policy guidance and operational framework geared toward restructuring cooperatives to operate on an independent, voluntary, and economically viable basis and to develop into centers for providing and disseminating agricultural inputs, implements, technologies, and information.
Ukiriguru Research Station	Government	Established during the early 1930s and currently under the Ministry of Agriculture and Food Security. Conducts research on cotton-related matters, especially releasing new cotton varieties and advising producers on recommended chemical use. In 1991, successfully released the UK91 variety, which is supposed to replace UK81 and UK87.
Tanzania Cotton Lint and Seed Board	Statutory body	Formed in 1995, effectively took over the activities of the Tanzanian Cotton Marketing Board. Its current responsibilities include advising the government on policy and strategies for developing the cotton industry; promoting development of the industry; licensing of persons engaged in the marketing, processing of cotton or cotton products; regulating for the control and eradication of cotton pests and diseases; and promoting and regulating the quality of cotton during marketing and export.
Primary societies	Private sector	Village-level associations whose membership consists of farmers. Often act as agents of cotton buyers. Responsible for distributing seed and other inputs to farmers. Engage in a number of other commercial and noncommercial activities.
Cooperative unions	Private sector	Associations of primary societies that often buy and gin cotton in their own facilities. Compete with private traders. Supposed to be private entities as of 1991.
Cotton Apex Organization	Private sector	Created in 1996, membership consists of all cooperative unions involved in marketing and ginning cotton. Promotes the interests of its members.
Tanzania Cotton Association	Private sector	Established in 1998, membership consists of cotton buyers, ginners, and exporters. Aims to encourage and maintain sustainable growth of the cotton industry, promote and protect the interests of those connected with it, and advise the government on matters related to the cotton industry.

Source: Government of Tanzania (2000); Tanzania Cotton Association; and author's interviews.

TABLE 9**COTTON PRODUCTION ACCORDING TO VARIOUS SOURCES, 1986/87–1998/99**

YEAR ^A	PRODUCTION (TONS)				PERCENTAGE OVER ICAC		
	GOVERNMENT OF TANZANIA			ICAC	Page 19	Page 32	Annex 4 ^a
	Page 19	Page 32	Annex 4 ^b				
1986/87	37,662	73,743	67,553	72,000	-48	2	-6
1987/88	48,605	86,290	79,610	85,000	-43	2	-6
1988/89	72,562	65,154	54,177	64,000	13	2	15
1989/90	48,137	62,101	35,504	38,000	27	63	-7
1990/91	45,740	47,952	48,688	51,000	-10	-6	-5
1991/92	71,414	90,770	85,500	106,000	-33	-14	-19
1992/93	62,054	104,816	96,372	48,000	29	118	101
1993/94	67,761	50,234	45,666	43,000	58	17	6
1994/95	38,968	42,650	40,431	94,000	-59	-55	-57
1995/96	55,956	75,194	82,756	84,000	-33	-10	-1
1996/97	69,617	85,147	86,931	66,000	5	29	32
1997/98	60,938	68,411	62,301	45,000	35	52	38
1998/99	36,200	45,404	36,453	55,000	-34	-17	-34
Average							
1986-94	56,742	72,633	64,134	63,375	-10	15	1
1994-99	52,336	63,336	61,775	68,800	-24	-8	-10

a. It refers to marketing years, which begin on July 1 for Tanzania and August 1 for the International Cotton Advisory Committee (ICAC).

b. Production in bales was converted to tons using a 181 kilograms per bale conversion factor.

Source: Government of Tanzania (1999b) and International Cotton Advisory Committee.

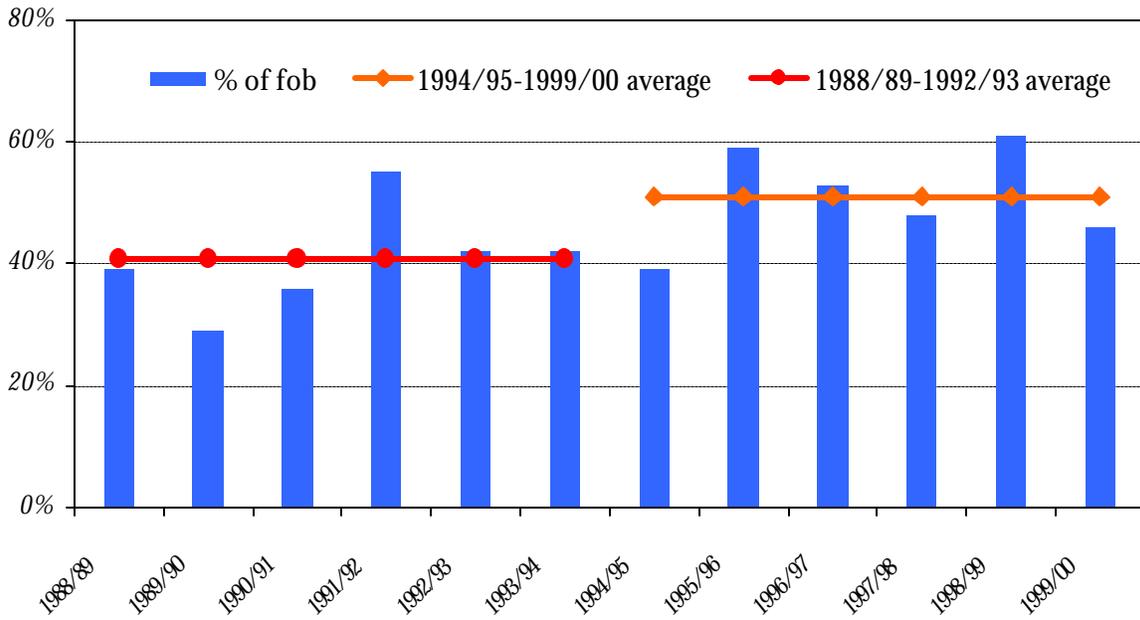
TABLE 10
PRICES RECEIVED BY COTTON GROWERS ACCORDING TO VARIOUS SOURCES
(TSH PER KILOGRAM OF SEED COTTON), 1993/94–1999/2000

MARKETING YEAR ^a	GOVERNMENT OF TANZANIA (1999a)	KABISSA AND MYAKA (2000)	GIBBON (1999)	GOVERNMENT OF TANZANIA (1998 AND 1999b)
1993/94	80	80	80	—
1994/95	120	120	120	—
1995/96	207	207	200	—
1996/97	170	170	160	—
1997/98	180	180	190	202
1998/99	185	185	—	180
1999/2000	—	123	—	—

— is not available.

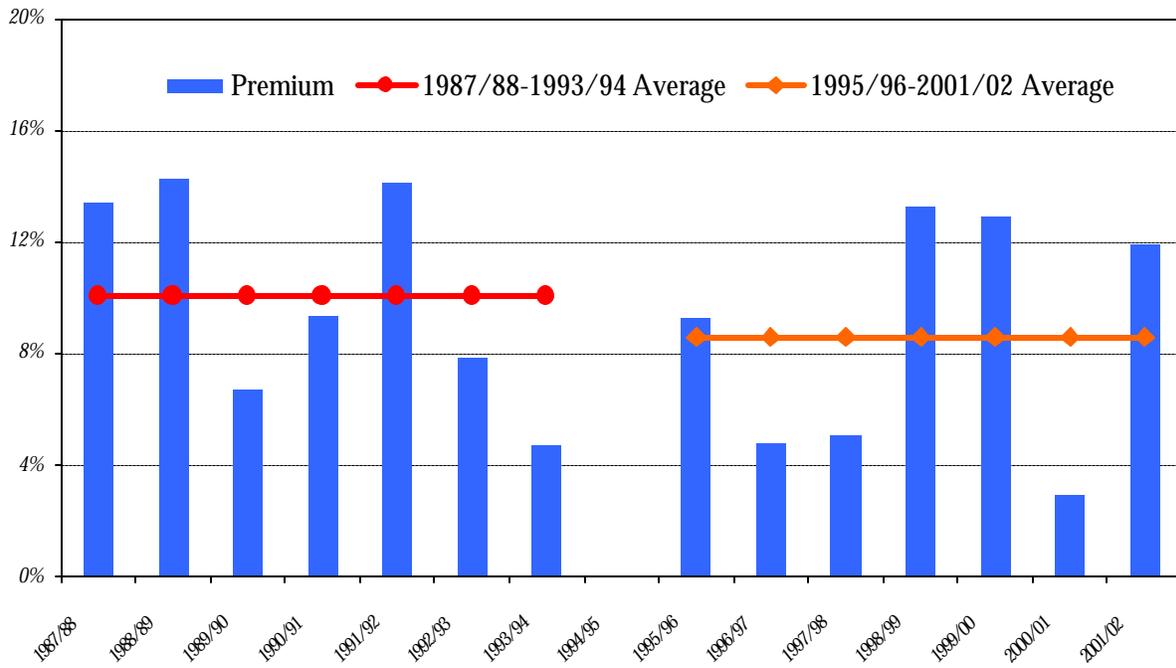
a. Marketing year begins July 1.

Figure 1: Producer's Share of Cotton Export Price



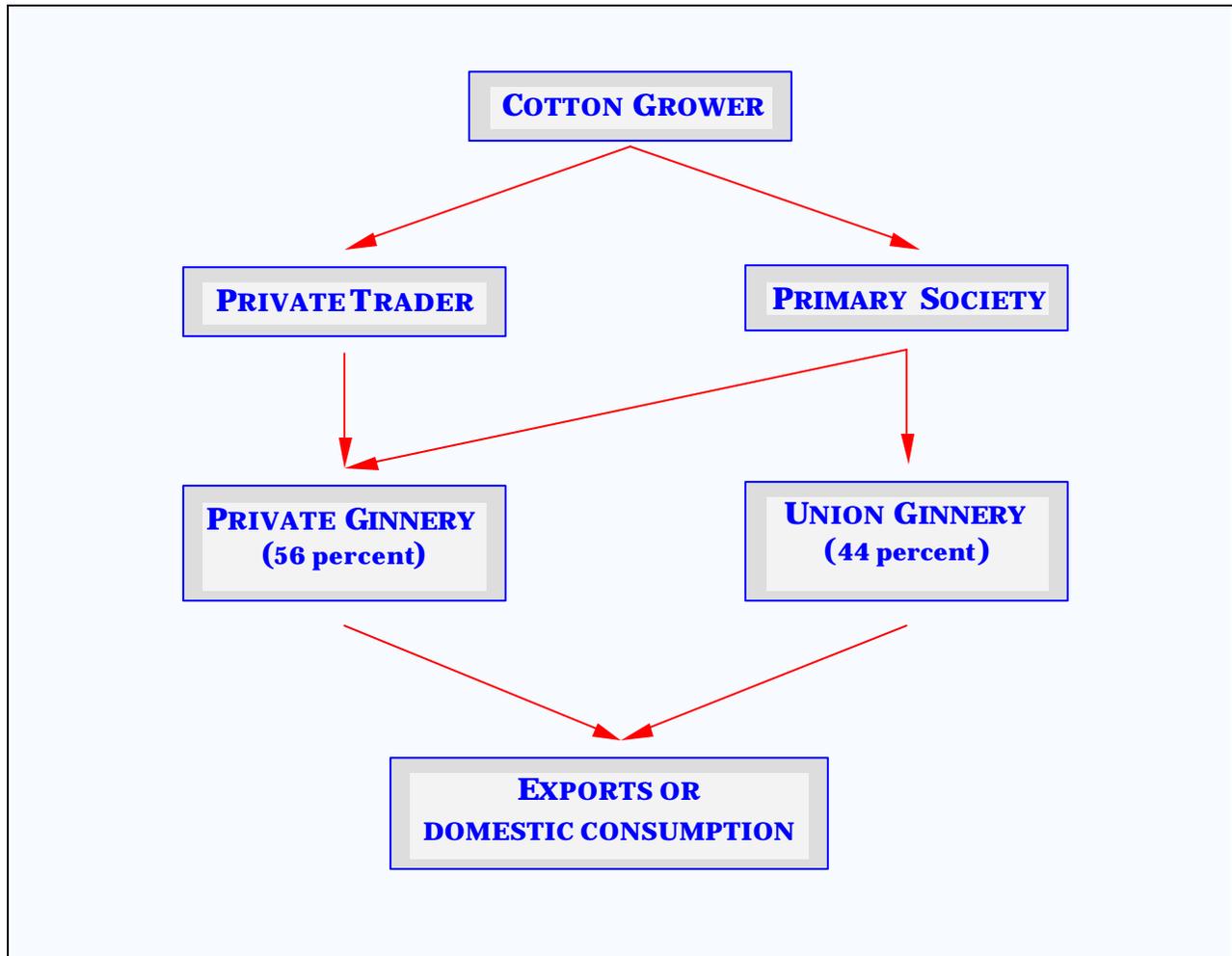
Source: Government of Tanzania (1999b)

Figure 2: Tanzania's Premium over the A Index



Source: Cotton Outlook

Figure 3: Post-1994 Cotton Marketing Chain in Tanzania



Notes: The numbers in parentheses are approximate marketing shares for the 1999/99 season.
Source: Author's interviews.

APPENDIX A: THE WORLD COTTON MARKET

Cotton production grew an average of 1.2 percent a year during the 1970s and 3.1 percent during the 1980s and then came to a virtual standstill during the 1990s, with production at about 18–20 million tons a year. The Northern Hemisphere accounts for about 90 percent of global output. China and the United States each account for about 20 percent, followed by India (12 percent), Pakistan (8 percent), and Uzbekistan (5 percent). Other significant cotton producers are the countries of Francophone Africa, Turkey, Brazil, Australia, and Greece, which together account for 18 percent of global output (table A1).

A third of cotton production is traded internationally. The four dominant exporters — United States, Francophone Africa, Uzbekistan, and Australia — account for more than two-thirds of exports. Three major producers — India, Pakistan, and Turkey — export no cotton and occasionally import it to supply domestic textile industries. Imports of cotton are more uniformly distributed than exports. During the 2000/01 season the eight largest importers—Indonesia, India, Mexico, Thailand, Turkey, Russia, Italy, and the Republic of Korea—accounted for over half of world imports. Cotton exports and imports have become less concentrated. During the 1970s the concentration index was 0.33 for imports and 0.44 for exports; in 2000/01 it was 0.11 for imports and 0.24 for exports. (The concentration index, also known as the Herfindahl index, is defined as the squared sum of shares of all countries; values equal to one indicate that a single country accounts for all exports; values close to zero indicate that a large number of countries have equal shares.)

During the 1990s nominal cotton prices, as measured by the Cotlook A Index (see below), fluctuated between \$2.53 a kilogram (May 1995) and \$0.97 a kilogram (December 1999) (table A2). Several factors contributed to the decline in prices after 1996. There was excess production during the 1997/98 season, and demand was weak, especially from the East Asian textile producers affected by the financial crisis of 1997 — Indonesia, Republic of Korea, and Thailand — which account for more than 15 percent of cotton import demand. Stocks rose to a record 9.8 million tons in 1997/98, pushing the stocks-to-use ratio to 0.51, its highest level since 1985/86. Currency devaluations in several East Asian chemical fiber producers also lowered the prices of competing synthetic fibers, further depressing demand for cotton. Between January 1997 and January 1998 the polyester fiber indicator price in the Republic of Korea declined from \$1.66 to \$0.79 per kilogram. The strength of the U.S. dollar also contributed to the price declines.

Cotton prices seemed to be recovering in 2000, reaching \$1.45 a kilogram in December 2000 — up 45 percent from a year earlier (figure A1). But the recovery was

short-lived, reflecting mainly the 1998/99 weather-related shortfall in the U.S. crop—at 3 million tons well below the 4 million ton average in the preceding five-year period. With production for the 2001/02 season at 21.1 million tons and consumption at 19.9 million tons (a 1.2 million ton surplus) cotton prices have been under intense pressure. The A Index dropped to \$0.82 per kilogram in October 2001 — the lowest since November 1972, with the exception of August 1986 (table A2).

The Cotton Sector Is Still Subject to Interventions

Cotton has been subject to numerous marketing and trade interventions. Townsend and Guitchounts (1994) estimate that in the early 1990s more than two-thirds of cotton was produced in countries with some form of government intervention. A worldwide switch to free market policies, they calculated, would lead to a decline in cotton production and an increase in prices.

Domestic interventions, whether taxes or supports/subsidies, occur through domestic market activities by state enterprises, price supports, and import duties or quotas. These activities result in the following broad (though not always distinct) types of distortions:

- *Taxation through a state marketing monopsony.* To transfer resources from cotton producers to the government, the state marketing agency pays fixed, below-world prices for cotton. This kind of intervention has been common in Central Asia, where the state handles both domestic marketing and international trade. In most of Francophone Africa domestic enterprises, along with a French state enterprise, control cotton marketing and trade.
- *Taxation through border interventions.* Typically to protect the domestic textile industries, the government uses border interventions to tax cotton producers. Egypt, India, Pakistan, and Turkey have occasionally exercised interventions of this nature.
- *Support to producers through price interventions.* To increase producers' income, cotton producers in the European Union receive support under the Common Agricultural Policy, amounting to twice the world price in some years, while U.S. cotton producers receive generous support, averaging a quarter of the market price during the late 1990s.
- *Support through border interventions.* To increase producers' income some countries, such as China, impose import tariffs on cotton.
- *Support through input subsidies.* In addition to output distortions, several distortions in input markets have affected the cotton sector, most notably subsidies on credit, fertilizer, and irrigation.

The International Cotton Advisory Committee (ICAC 2001, 2002) has been monitoring support to cotton producers since 1997/98 (table A3). For eight countries

(United States, China, European Union, Turkey, Brazil, Mexico, and Egypt), direct production assistance in the five seasons between 1997/98 and 2001/02 has ranged from \$3.8 to \$5.3 billion. For 2001/02 direct assistance to cotton producers reached \$2.3 billion in the United States, \$1.2 billion in China, and \$0.8 billion in the European Union (Greece and Spain). India was also a big cotton supporter that season, providing an estimated \$0.5 billion to producers. Producers in Turkey, Brazil, Mexico, and Egypt received a combined total of \$150 million in support.

In addition to domestic interventions the cotton sector has been affected by the Multi-Fibre Arrangement, an international agreement created under the auspices of General Agreement on Tariffs and Trade (GATT) that allowed industrial countries to restrict textile imports from developing countries. In the United States alone, for example, the tariff equivalent on trade restriction for textiles and apparel averaged almost 45 percent during between 1996 and 2000.

Small Producers Have Reformed but Major Players Have Not

During the 1990s a number of countries undertook reforms. The advanced reformers, Uganda and Zimbabwe, followed a similar pattern, but different strategies (Baffes 2001). In Uganda there was no alternative to reform (and hence little opposition) because the state company went bankrupt, a victim of political instability and poor management. The state cotton company of Zimbabwe also went bankrupt (producers were not being paid the agreed amount or on time) though the event that probably triggered the reforms was the 1991/92 drought.

In Uganda three years passed before there was a supply response to the reforms (table A4). Production recovered in the 1999/2000 season and reached 20,000 tons, and producers' share in world prices rose from less than 50 percent to 70 percent. New traders and exporters entered the sector. In Zimbabwe production increased following the reforms, and producers received 80–90 percent of world prices. The emergence of private traders, exporters, and ginners has given new dynamism to the rural sector.

Reforms among the major producers have been less significant. Under the Common Agricultural Policy of the European Union ginners receive support payments, which are passed on to producers in the form of higher prices. Advance payments are based on estimates of seed cotton production and the difference between market prices and a guide (support) price. The policy also influences the quantity of cotton produced by providing assistance for a maximum guaranteed quantity of seed cotton (782,000 tons of seed cotton for Greece and 249,000 for Spain). Reforms in 1999 maintained the guide price level and the maximum guaranteed quantity of seed cotton for which assistance is provided while boosting penalties (reducing subsidies) for production over the maximum guaranteed quantity. For each 1 percent of excess production the level of

subsidy is lowered by 0.6 percent of the guide price, up from 0.5 percent. Between 1995/96 and 1999/2000 the budgetary expenditure on cotton aid ranged from 740 million euros to 903 million euros, implying that EU cotton producers received more than twice the A Index on average. In addition to output subsidies EU cotton producers receive input subsidies on irrigation and credit.

Cotton producers in the United States receive support payments through various programs, including direct income payments, market price payments, and export subsidies. Direct payments, introduced with the 1996 Farm Bill to compensate for the elimination of deficiency payments, are predetermined annual payments based on historical cotton production areas. Market price payments include the marketing assistance loan and loan deficiency payments programs. Export subsidies, or Step 2 market payments, are made to eligible cotton exporters and domestic end users of cotton when U.S. prices exceed Northern European c.i.f prices by a set level and the world price is within a set level of the base loan rate. The objective is to bridge the gap between higher U.S. prices and world prices so that U.S. exporters and mills can maintain their competitiveness. According to the International Cotton Advisory Committee, U.S. budgetary expenditures on cotton production (excluding Step 2) ranged from \$0.6 to 2.3 billion between 1997/98 and 2001/2002 (table A4). Adding in all expenditures on cotton supports, such as the insurance subsidy, emergency measures, and Step-2 payments, increases the total by an average of 60 percent. For example, support during the 2001/02 season exceeded \$3.7 billion (table A5).

The government of China protects its cotton sector through support prices, import tariffs, export subsidies, and public stockholding. The government sets a reference price for cotton, typically above the world price. Cotton exports are subsidized through direct payments by the central government to exporting agencies. China also maintains import tariffs that bridge the gap between domestic and world prices. Under its WTO accession arrangements the tariffs will be reduced to 15 percent while a tariff-related quota system will be implemented to manage imports. Conservative estimates by the International Cotton Advisory Committee indicate that budgetary support to the cotton sector in the last five seasons ranged from \$1.2 to \$2.6 billion (table A5).

In September 1999 the government of China announced reform measures intended to make the sector more efficient. The initial steps included creation of a cotton exchange to facilitate domestic spot trading, lower producer prices, and lower stocks. Following these reforms China's stocks declined from 4.1 million tons in 1998/99 to 2.3 million tons in 2000/01. (Note that the accuracy and quality of China's stocks are questioned within the cotton industry and their level appears to have been very high.)

At the international level the Multi-Fibre Arrangement effectively protected the textile industry in developed countries and distorted the location of textile processing. Martin (1996) estimates that the arrangement imposed an implicit tax of about 20 percent on cotton products relative to synthetic fiber products. In 1994 the Multi-Fibre Arrangement was replaced by the Agreement on Textiles and Clothing. All import quotas are to be eliminated by 2005. Their elimination is expected to encourage the relocation of textile processing facilities from developed to developing countries, reduce the cost of production, boost cotton demand, and consequently raise cotton prices. The cotton sectors of developing countries, especially in Africa, may be affected indirectly by the Cotonu Agreement (the successor of the Lomé Convention) of 2000 between the European Union and 77 African, Pacific and Caribbean countries, and the Africa Growth Opportunity Act recently introduced by the United States. These two agreements are expected to increase regional (but not global) demand for cotton.

Moderate Growth in the Long Term

The factors expected to influence the long-term outlook for cotton can be grouped into four categories: domestic policies of major producers, the international environment, profitability of the sector, and demand growth.

Domestic policies of major producers. Expectations for further policy reforms from major producers are mixed. The European Union is likely to support cotton for some time to come, though the support is unlikely to increase (new EU entrants are not cotton producers) or decline (current support supposedly goes to low-income areas and so is regarded as a welfare program). The United States took a step in the right direction by replacing deficiency payments to producers with direct income support in 1996, but all progress was eliminated with the 2002 Farm Bill, which gives much more support to cotton growers. The bill, intended to be in effect for the next 10 years, may not last that long because of the large budgetary outlays, but it is reasonable to assume that U.S. cotton farmers will be receiving very generous support for at least the next 2-3 years. China's reforms are the most promising. Early steps indicate that its cotton sector will soon be exposed to internal and external competition. In Uzbekistan not much is expected on the taxation side. In Francophone Africa, where reforms are under way, results are likely to emerge in the near term. In Benin, Côte d'Ivoire, and Mali, for example, the government has already withdrawn (to various degrees) from the marketing of cotton.

The international environment. While the phaseout of quotas under the Agreement on Textiles and Clothing is expected to end distortions in the location of textile companies, it is unclear whether the expected benefits will be fully realized. The agreement is back-loaded, with most reforms expected to take place in the last year,

thus increasing the risk of noncompliance. And several countries (mainly in the European Union) have repeatedly sought to impose antidumping duties on textile imports from Asia in recent years. The attempts were unsuccessful, but largely because the EU countries were not united in supporting this issue.

Profitability of the sector. Following impressive growth of 3.4 percent during the 1980s — reflecting mainly expansion of irrigated cotton — average world cotton yields stagnated at about 570 kg a hectare in the 1990s. With no major area with irrigation potential to be brought into cotton production (except in Turkey and the southeastern Anatolia irrigation project), yields are not expected to increase in the near future barring a major technological breakthrough.

Genetically modified cotton has the potential of reducing the cost of production and hence increasing profitability. Genetically modified cotton accounted for more than two-thirds of the area allocated to cotton in the United States during the 2000/01 season. The United States and to a lesser extent Australia and China are users of genetically modified cotton. But while resistance is less severe for genetically modified cotton than food products, consumer acceptance of genetically modified products has not been encouraging.

Organic cotton may be a small market niche that developing countries can exploit. With their low reliance on chemicals and fertilizer, they can be classified as “organic” cotton producers without altering their production practices. While many countries, including in Africa, have begun organic cotton initiatives, the scale is still insignificant compared with global production of conventional cotton, mainly because of the difficulty of the certification process (Ratter 1999).

Demand growth. Two factors are expected to influence cotton demand: the share of synthetics in total fiber consumption and world income growth. From more than 80 percent in 1950, cotton’s share in total fiber consumption fell to 50 percent by 1980 and to 42 percent by the end of the 1990s. A few industrial countries have tried to increase cotton’s share in fiber consumption through promotional activities. Results have been favorable, but developing countries have not engaged in similar activities. Even without such efforts, however, cotton’s share could increase because of consumers’ growing preference for natural over synthetic products. On the income growth side the picture is more optimistic. With annual world income expected to grow 2.9 percent for the remainder of the decade (World Bank 2002) and an estimated income elasticity of 0.6 (Reeves, Vincent, and Quirke 2001), cotton consumption could grow by as much as 1.7 percent a year during the decade.

The Cotlook A and B Indices

The Cotlook A Index is the average of the 5 lowest quotations of 16 styles of cotton (Middling 1-3/32'') traded in North European ports from the following origins: Australia, Brazil, China, Francophone Africa, Greece, India, Mexico, Pakistan, Paraguay, Spain, Syria, Tanzania, Turkey, the United States, and Uzbekistan. The Cotlook B Index is the average of the three lowest quotations of eight styles of coarser grades of cotton from Argentina, Brazil, China, India, Pakistan, Turkey, the United States, and Uzbekistan.

The indices are compiled daily by Cotton Outlook, a private company in Liverpool. Staff collect quotations by interviewing cotton traders and merchants in North Europe, and they also look at other market developments likely to affect cotton prices. These offering prices and the day's indices are published at about 2:30 p.m. UK time.

The prices are expressed in U.S. cents per pound, c.i.f. North Europe, cash against documents on arrival of vessel, including profit and agent's commission. When a particular cotton growth is not offered in large volume, the quotation is still reported, but it is not eligible to participate in the index. The index is based on the three or five least expensive quotations because quotations reflect offering prices, not the level at which business has been arranged, so a buyer would normally expect to succeed with bids that are slightly lower than quoted.

The quotations represent nearby delivery, normally between two and four months. A dual quotation is reported when information on supply conditions of the next cotton season is readily available: one for nearby delivery and one for forward delivery. For example, quotations on July 12, 2001 refer to July/August 2001 delivery (nearby) and October 2001 to May 2002 delivery (forward). Table A6 depicts the composition of the Cotlook A and B Indices for three randomly selected dates: July 12 (nearby and forward delivery), August 30 (nearby delivery), and October 18, 2001 (nearby delivery).

Cotton Price Risk Management

Cotton was one of the first commodities to be traded in futures markets. Earlier in the 20th century there were at least 10 active cotton futures exchanges (Baffes and Kaltsas 2002). Currently, there is only one major cotton futures and options contract, which is traded at the New York Board of Trade. The New York contract, whose size is 50,000 pounds, uses Memphis No. 2 cotton as the cash price equivalent for quality specification and delivery purposes. There are five delivery months (March, May, July, October, and December), and the nearest 10 delivery months are available for trade, extending the

time span of the contract to almost two years — a July 2001 contract could be traded as early as August 1999. Table A7 reports the closing futures prices for the March, May, and July 2002 contracts on January 3, 11, and 13, 2002. It also reports the strike prices and costs for the corresponding put options.

The New York contract is appropriate only for U.S. cotton, however. Non-U.S. cotton traders and merchants have no access to a hedging instrument. *Cotton Outlook* (December 12, 1997, p. 3) observed that the lack of an international trading instrument — one that consistently reflects broad world cotton market developments but is capable of being used as hedge — continues to be a shortcoming of the current pricing system. The 59th ICAC Plenary Meeting in Cairns reached a similar conclusion (ICAC 2001):

Futures contracts traded in New York are limited to the delivery of U.S. cotton to U.S. locations. Accordingly, prices in New York reflect primarily U.S. conditions. As a consequence, prices for cotton in non-U.S. locations can diverge from New York futures prices, limiting the utility of the New York market for many in the world industry.

Comovement between the New York contract and the Cotlook A Index is low, confirming the inadequacy of the New York contract as a hedging tool for traders and merchants of non-U.S. types of cotton. As an example, in December 31, 1990, the May 1991 New York contract closed at 76.19 cents a pound, 8.21 cents below the Cotlook A Index, and it expired on May 8, 1991, at 92.22 cents a pound, 8.92 cents above the Cotlook A Index. In a study using an error-correction specification and weekly cotton prices (components of the A Index) from August 1985 to December 1987 and August 1995 to January 1997, Baffes and Ajwad (2001) found that, unlike Central Asian, West African, and (to some extent) Greek prices, U.S. prices moved relatively independently of other prices.

Several efforts have been made since the late 1990s to establish an international trading instrument for cotton. Brazil reintroduced its cotton contract in 1996 and India in 1998. China, Euronext (the European Trading Alliance), Turkey, and the United States are also contemplating new initiatives. The Cotton Exchanges in Brazil and India are not used by foreign traders, but the one in Europe, if launched, is expected to trade Central Asian and West African cotton, making it a useful hedging tool for traders and merchants of non-U.S. cotton. The Common Fund for Commodities has recently launched a project investigating ways to manage cotton price risk in Tanzania, Uganda, and Zimbabwe, with the Cotton Company of Zimbabwe as the project executing agency.

TABLE A1**GLOBAL BALANCE OF THE COTTON MARKET (THOUSAND TONS), 1960-2002**

	1960 ^a	1970	1980	1990	1998	1999	2000	2001	2002
PRODUCTION									
United States	3,147	2,219	2,422	3,376	3,030	3,835	3,818	4,393	4,436
China	1,372	1,995	2,707	4,508	4,501	3,830	4,350	5,100	3,825
India	1,012	909	1,322	1,989	2,710	2,650	2,350	2,459	2,377
Pakistan	306	543	714	1,638	1,480	1,800	1,750	1,743	1,683
Uzbekistan ^b	1,491	2,342	2,661	2,593	1,000	1,150	960	1,055	991
Franc Zone	63	140	224	562	897	928	700	991	972
Turkey	192	400	500	655	871	826	740	900	917
Brazil	425	549	623	717	420	648	848	725	798
Australia	2	19	99	433	726	733	704	658	542
Greece	63	110	115	213	405	428	420	410	341
Egypt	480	509	529	296	230	229	206	279	264
World	10,201	11,740	13,831	18,970	18,551	18,887	18,901	20,856	19,076
ENDING STOCKS									
United States	1,574	915	653	510	849	860	1,174	1,826	2,222
China	0	412	299	1,550	4,124	2,814	2,263	2,347	1,949
India	635	376	59	539	1,011	910	848	812	583
Brazil	144	321	391	231	317	370	505	536	401
Pakistan	52	55	204	313	353	463	353	616	373
Australia	5	13	61	150	424	431	371	378	348
World	4,643	4,605	5,152	6,653	9,699	8,710	7,917	9,896	9,092
EXPORTS									
United States	1,444	848	1,290	1,697	915	1,481	1,470	2,134	2,056
Franc Zone	48	137	185	498	843	769	704	804	985
Uzbekistan ^b	381	553	616	397	900	900	820	718	717
Australia	0	4	53	329	650	710	720	650	609
Greece	33	0	13	86	230	294	293	257	249
Syria	97	134	71	91	210	180	245	220	171
World	3,667	3,875	4,414	5,081	5,274	6,054	5,875	6,167	6,256
IMPORTS									
Indonesia	7	36	106	324	500	455	520	559	537
India	204	155	0	0	136	200	340	425	509
Mexico	0	1	0	43	302	436	473	396	352
Thailand	4	46	86	354	271	302	360	387	356
Turkey	0	1	0	46	250	459	285	385	358
Russia ^b	0	238	28	37	179	284	325	341	338
Italy	218	178	193	336	330	365	310	323	315
Korea, Rep.	51	121	332	447	330	350	315	318	298
Japan	800	796	697	634	270	276	242	247	240
Taiwan (China)	47	160	214	358	293	322	269	225	214
World	3,804	4,086	4,555	5,222	5,429	5,811	5,875	6,167	6,256

a. The crop year begins August 1.

b. Data for Uzbekistan and Russia are based on USSR data up through 1990.

Source: ICAC, *Cotton: Review of the World Situation*, various issues.

TABLE A2: COTTON PRICES, 1960-2002 (US DOLLARS PER KILOGRAM)

YEAR	MONTHLY												ANNUAL	
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	NOMINAL	REAL ^A
1960	0.65	0.65	0.65	0.64	0.65	0.66	0.66	0.65	0.66	0.67	0.67	0.66	0.65	2.81
1961	0.66	0.68	0.67	0.67	0.68	0.68	0.68	0.67	0.67	0.68	0.66	0.66	0.67	2.85
1962	0.66	0.66	0.66	0.66	0.66	0.66	0.65	0.64	0.63	0.63	0.63	0.65	0.65	2.73
1963	0.66	0.65	0.65	0.64	0.64	0.64	0.64	0.64	0.65	0.65	0.64	0.64	0.65	2.71
1964	0.66	0.66	0.65	0.65	0.66	0.66	0.65	0.64	0.65	0.65	0.64	0.64	0.65	2.68
1965	0.64	0.67	0.65	0.65	0.65	0.63	0.63	0.63	0.63	0.62	0.62	0.62	0.64	2.59
1966	0.62	0.62	0.64	0.62	0.62	0.62	0.62	0.62	0.61	0.63	0.63	0.63	0.62	2.42
1967	0.64	0.66	0.66	0.66	0.66	0.67	0.67	0.68	0.69	0.70	0.71	0.72	0.68	2.57
1968	0.72	0.71	0.71	0.71	0.71	0.70	0.69	0.68	0.66	0.66	0.63	0.62	0.68	2.68
1969	0.63	0.63	0.63	0.63	0.63	0.62	0.61	0.60	0.61	0.63	0.65	0.66	0.63	2.31
1970	0.64	0.65	0.66	0.66	0.66	0.67	0.67	0.68	0.69	0.70	0.71	0.72	0.63	2.25
1971	0.73	0.74	0.73	0.73	0.75	0.79	0.80	0.83	0.83	0.82	0.82	0.85	0.74	2.51
1972	0.89	0.90	0.87	0.87	0.86	0.83	0.78	0.74	0.73	0.78	0.81	0.86	0.79	2.46
1973	0.89	0.91	0.96	1.03	1.15	1.22	1.46	1.67	1.91	1.93	1.75	1.82	1.36	3.63
1974	1.99	1.84	1.69	1.61	1.47	1.40	1.32	1.33	1.32	1.26	1.17	1.09	1.42	3.11
1975	1.05	1.06	1.09	1.16	1.22	1.23	1.25	1.31	1.33	1.32	1.30	1.35	1.16	2.30
1976	1.47	1.52	1.54	1.56	1.61	1.80	2.00	1.92	1.88	1.92	1.91	1.84	1.69	3.31
1977	1.75	1.86	1.92	1.89	1.78	1.61	1.57	1.51	1.43	1.39	1.41	1.42	1.55	2.81
1978	1.46	1.53	1.58	1.60	1.63	1.60	1.55	1.59	1.63	1.67	1.73	1.71	1.57	2.45
1979	1.68	1.67	1.69	1.64	1.68	1.70	1.70	1.71	1.72	1.72	1.77	1.82	1.69	2.36
1980	1.94	2.13	2.06	1.99	1.95	1.85	1.94	2.11	2.22	2.18	2.16	2.18	2.05	2.60
1981	2.18	2.12	2.04	1.98	1.95	1.93	1.89	1.77	1.70	1.67	1.65	1.58	1.85	2.34
1982	1.55	1.54	1.55	1.58	1.69	1.67	1.73	1.66	1.60	1.55	1.52	1.54	1.60	2.09
1983	1.58	1.64	1.74	1.77	1.81	1.90	1.95	2.00	1.98	1.94	1.97	1.97	1.85	2.49
1984	1.93	1.93	1.95	1.96	1.97	1.85	1.74	1.66	1.61	1.62	1.60	1.59	1.79	2.45
1985	1.57	1.51	1.48	1.46	1.43	1.39	1.34	1.26	1.18	1.08	1.06	1.06	1.32	1.83
1986	1.14	1.20	1.15	1.07	1.00	0.90	0.83	0.82	0.96	1.13	1.16	1.30	1.06	1.27
1987	1.45	1.45	1.39	1.46	1.69	1.75	1.84	1.91	1.84	1.68	1.67	1.66	1.65	1.81
1988	1.59	1.49	1.46	1.45	1.45	1.52	1.40	1.27	1.25	1.27	1.29	1.35	1.40	1.45
1989	1.39	1.39	1.46	1.63	1.71	1.74	1.83	1.83	1.80	1.81	1.81	1.71	1.67	1.74

Continues on next page

TABLE A2 (continued): COTTON PRICES, 1960-2002 (US DOLLARS PER KILOGRAM)

YEAR	MONTHLY												ANNUAL	
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	NOMINAL	REAL ^a
1990	1.66	1.68	1.74	1.83	1.89	1.99	2.01	1.79	1.79	1.79	1.82	1.85	1.82	1.82
1991	1.85	1.87	1.86	1.83	1.82	1.78	1.70	1.62	1.55	1.50	1.40	1.36	1.68	1.64
1992	1.31	1.24	1.22	1.28	1.34	1.41	1.44	1.32	1.25	1.17	1.16	1.20	1.28	1.21
1993	1.26	1.33	1.36	1.35	1.33	1.30	1.27	1.22	1.22	1.21	1.21	1.31	1.28	1.20
1994	1.53	1.78	1.80	1.85	1.90	1.89	1.80	1.69	1.66	1.63	1.71	1.92	1.76	1.60
1995	2.11	2.23	2.44	2.51	2.53	2.00	1.93	1.88	2.01	2.01	1.97	1.94	2.13	1.82
1996	1.90	1.87	1.83	1.83	1.83	1.83	1.76	1.68	1.66	1.66	1.68	1.75	1.77	1.59
1997	1.76	1.77	1.78	1.74	1.75	1.78	1.79	1.79	1.76	1.72	1.70	1.64	1.75	1.69
1998	1.59	1.52	1.51	1.45	1.42	1.52	1.54	1.50	1.46	1.36	1.24	1.23	1.44	1.45
1999	1.23	1.24	1.25	1.27	1.32	1.29	1.20	1.12	1.09	1.05	1.02	0.97	1.17	1.18
2000	1.05	1.18	1.26	1.29	1.33	1.31	1.29	1.34	1.36	1.34	1.41	1.45	1.30	1.34
2001	1.41	1.33	1.20	1.13	1.10	1.05	1.00	0.96	0.91	0.82	0.84	0.95	1.06	1.14
2002	0.96	0.94	0.93	0.91	0.88	0.96	1.03	1.09	1.08					

Note: Mexican c.i.f. North Europe up to December 1966; A Index since January 1967.

a. Deflated by manufacturing unit value (1990 = 1.0).

Source: World Bank *Commodity Price Data*.

TABLE A3**DIRECT GOVERNMENT ASSISTANCE TO COTTON PRODUCERS, 1997/98-2001/02**

COUNTRY	1997/98	1998/99	1999/20000	2000/01	2001/02 ^a
Total production assistance (million US dollars)					
United States	597	1,480	2,056	1,020	2,291
China	2,013	2,648	1,534	1,900	1,196
Greece	659	660	596	537	537
Spain	211	204	287	179	179
Turkey	na	220	199	106	59
Brazil	29	52	44	44	50
Mexico	13	15	28	23	23
Egypt	290	na	20	14	18
Total	3,812	5,279	4,764	3,822	4,353
Assistance per kilogram produced (U.S. dollars)					
United States	0.15	0.49	0.56	0.27	0.52
China	0.44	0.59	0.40	0.43	0.22
Greece	1.94	1.85	1.37	1.27	1.31
Spain	1.82	1.96	1.51	1.90	1.67
Turkey	na	0.25	0.36	0.12	0.07
Brazil	0.07	0.10	0.06	0.05	0.07
Mexico	0.06	0.07	0.21	0.19	0.20
Egypt	0.85	na	0.09	0.11	0.07
Cotlook A Index (July/August Average, U.S. dollars per kilogram)					
	1.60	1.30	1.16	1.26	0.91
Assistance as a percentage of the Cotlook A Index					
United States	9	38	48	22	57
China	27	45	35	34	25
Greece	121	142	118	101	144
Spain	114	151	130	151	184
Turkey	na	19	31	10	7
Brazil	4	8	6	4	7
Mexico	4	5	18	15	22
Egypt	53	Na	7	9	8

na. Not applicable.

a. Data for 2001/02 are preliminary.

Source: International Cotton Advisory Committee (2001, 2002).

TABLE A4
PRODUCTION AND AREA UNDER COTTON IN UGANDA, ZIMBABWE, AND
TANZANIA, 1970/71-2001/02

YEAR	UGANDA		ZIMBABWE		TANZANIA	
	OUTPUT (thousands of tons)	AREA (thousands of hectares)	OUTPUT (thousands of tons)	AREA (thousands of hectares)	OUTPUT (thousands of tons)	AREA (thousands of hectares)
1970/71	75	877	49	85	76	283
1980/81	4	312	62	134	43	387
1990/91	8	89	72	273	51	320
1991/92	7	134	88	235	106	450
1992/93	9	174	75	246	48	430
1993/94	5	71	60	230	43	344
1994/95	6	74	38	194	94	172
1995/96	10	120	104	246	84	344
1996/97	20	95	101	313	66	283
1997/98	7	38	105	315	45	350
1998/99	25	250	130	320	55	350
1999/2000	22	202	128	250	36	250
2000/01	24	206	152	363	40	215
2001/02	28	243	131	400	91	525

Source: International Cotton Advisory Committee, *Cotton: Review of the World Situation*.

TABLE A5

TOTAL GOVERNMENT ASSISTANCE TO U.S. COTTON SECTOR, 1996/97-2001/02
(millions of U.S. dollars)

PROGRAM	1996/97	1997/98	1998/99	1999/2000	2000/01	2001/02
Loan Deficiency Payments	0.0	2.2	323.0	687.3	151.4	732.1
Marketing Loan Gains	0.0	26.2	239.8	859.8	390.3	1,512.8
Forfeitures	1.6	0.3	3.3	1.1	17.2	0.1
<i>All Loans</i>	<i>1.6</i>	<i>28.7</i>	<i>566.1</i>	<i>1,548.2</i>	<i>558.8</i>	<i>2,245.0</i>
Production Flexibility Contract	698.8	597.0	637.0	614.0	575.2	473.9
Market Loss Assistance	0.0	0.0	316.2	613.5	612.8	523.6
Insurance	157.2	147.7	154.9	223.3	215.8	266.4
<i>All Other</i>	<i>856.0</i>	<i>744.7</i>	<i>1,108.1</i>	<i>1,450.7</i>	<i>1,403.8</i>	<i>1,264.0</i>
<i>Step-2</i>	<i>na</i>	<i>156.0</i>	<i>116.0</i>	<i>180.0</i>	<i>85.0</i>	<i>197.0</i>
Total	857.6	929.3	1,790.3	3,178.9	2,047.6	3,705.9

Source: United States Department of Agriculture.

TABLE A6

COMPOSITION OF THE COTLOOK A AND B INDICES (U.S. cents per pound)

ORIGIN	JULY 12, 2001 (nearby)	JULY 12, 2001 (forward)	AUGUST 30, 2001 (nearby)	OCTOBER 18, 2001 (nearby)
Australia	50.00	52.25	51.50	44.25
Brazil	46.50	46.00 ^a	43.00 ^a	nq
China	nq	nq	nq	nq
Africa, Franc Zone	47.00 ^a	45.50 ^a	43.25	38.00 ^a
Greece	44.00 ^a	44.75 ^a	42.00 ^a	35.25 ^a
India	nq	nq	nq	nq
Mexico	nq	nq	nq	nq
Pakistan	nq	nq	nq	nq
Paraguay	45.00 ^a	nq	nq	nq
Spain	49.50	46.00 ^a	43.00 ^a	38.25 ^a
Syria	47.00 ^a	46.50	42.00 ^a	36.00 ^a
Tanzania	nq	49.00	47.00	nq
Turkey	nq	nq	nq	Nq
United States (California/Arizona)	50.50	53.75	50.50	42.25
United States (Memphis/Eastern)	52.00	53.00	49.75	40.50
Uzbekistan	47.00 ^a	45.50 ^a	42.50 ^a	36.00 ^a
A Index	46.00	45.55	42.50	36.70
Argentina	45.50 ^b	nq	nq	Nq
Brazil	nq	43.50 ^b	40.50 ^b	37.00
China	nq	nq	nq	Nq
India	nq	nq	nq	Nq
Pakistan	nq	44.50 ^b	41.50	33.50 ^b
Turkey	nq	nq	nq	Nq
United States (Orleans/Texas)	43.00 ^b	45.00	41.25 ^b	34.00 ^b
Uzbekistan	45.00 ^b	44.00 ^b	41.00 ^b	34.50 ^b
B Index	44.50	44.00	40.90	34.00

nq. No quotation is available from this origin that week.

a. One of the five least expensive.

b. One of the three least expensive.

Source: *Cotton Outlook*, July 13, August 31, and October 19, 2001 issues

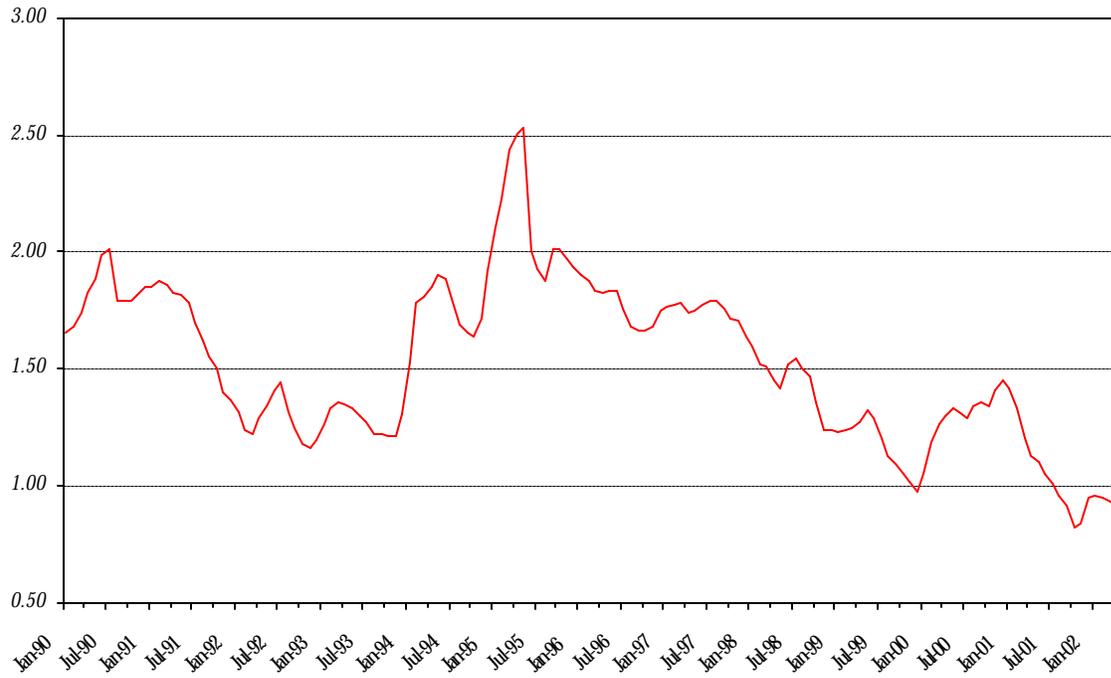
TABLE A7

INDICATIVE COTTON FUTURES AND PUT OPTIONS STRIKE PRICES AND
COSTS (cents per pound)

	MARCH 2002	MAY 2002	JULY 2002
JANUARY 3, 2002	CLOSING FUTURES PRICE		
	36.46	37.90	39.30
STRIKE PRICE	COST OF PUT OPTION		
38.00	2.44	2.58	2.50
36.00	1.29	1.64	1.70
34.00	0.56	0.95	1.10
JANUARY 11, 2002	CLOSING FUTURES PRICE		
	37.40	38.88	40.40
STRIKE PRICE	COST OF PUT OPTION		
40.00	3.15	3.15	2.69
38.00	1.75	2.08	2.04
36.00	0.83	1.26	1.33
35.00	0.53	0.95	1.04
JANUARY 13, 2002	CLOSING FUTURES PRICE		
	36.80	38.30	39.80
STRIKE PRICE	COST OF PUT OPTION		
40.00	3.43	3.32	3.20
38.00	1.84	2.18	2.22
36.00	0.75	1.30	1.45

Source: New York Board of Trade.

Figure A1: Monthly Cotton Prices (US dollars per kilogram)



Source: World Bank, *Commodity Price Data*

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