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**Cotton Sector Policies and Performance in Sub-Saharan Africa:
Lessons Behind the Numbers in Mozambique and Zambia**

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Abstract

Cotton is one of the most important smallholder cash crops in Sub-Saharan Africa (SSA). How to ensure input supply, credit recovery and competition is a subject of intense policy debate. This paper examines the performance of cotton sector development policies in Mozambique and Zambia. Both countries face the challenge of organizing input supply to farmers in the absence of rural credit markets, and competing in international markets distorted by production subsidies in developed countries. Both countries privatized cotton ginning in the 1990s. Emerging from civil war, Mozambique established geographical monopolies to interlink input and output markets and facilitate credit recovery. In Zambia, the government completely liberalized the cotton sector, forcing the private sector to deal with the problem of input distribution and credit recovery by itself. Despite being landlocked, Zambia's cotton sector has achieved better performance in terms of both value of cotton output per hectare and smallholder share of world market prices. An analysis of the institutional and technical factors behind the two countries' performance provides insights to guide the design of public/private partnerships relevant to many SSA countries.

Keywords: Cotton, Mozambique, Zambia, liberalization, agricultural policy

Introduction

Cotton is one of Sub-Saharan Africa's (SSA) rare success stories over the past 20 years. While the continent's share of world agricultural trade fell by half from 1980 to 2000, its share of world cotton trade rose by 30% (FAO, 2002). Cotton production grew three times more rapidly in SSA over the period than it did in the rest of the world (Goreux and Macrae, 2002). Moreover, cotton is a predominantly smallholder crop in SSA, with over two million poor rural households depending on it for their main source of cash income.

Because of the need for purchased inputs to achieve economic on-farm yields, and high quality requirements throughout the supply chain to be competitive in world markets, processed commodities such as cotton require a great deal of coordination to be produced, processed, and marketed competitively. Since most farmers in SSA require credit to access the needed inputs, one of the key coordination challenges is to ensure timely access to and use of appropriate inputs, and subsequently to recover the credit. Due to widespread credit market failure in SSA, most approaches to the input credit problem have featured *interlocked transactions*, often enforced by some degree of statutory monopoly, in which inputs are provided directly to farmers on credit and the credit is recovered upon purchase of the product (Dorward et al., 1998).

The weakness of contract enforcement mechanisms in most SSA countries has fueled concerns that the economic reforms sweeping the continent since the early 1990s may undermine credit recovery, leading to the collapse of cotton input systems and thus to the end of this remarkable success story. Depressed world market prices for cotton lint, caused in part by massive subsidies provided to cotton farmers in developed economies, exacerbate these concerns.¹ With a decade of experience of cotton sector reform in SSA, it is now possible to review the empirical record and begin drawing lessons for future policy. In this paper, we examine the experience of Mozambique and Zambia, whose contrasting policy approaches and performance appear to challenge concerns that liberalization inevitably leads to the collapse of input systems for crops like cotton. We first place these countries in context by providing a brief empirical overview of the performance of cotton sectors in seven SSA countries of Southern, Eastern, and West Africa. We then focus on Mozambique and Zambia, reviewing their differing initial conditions at the outset of reform, the divergent policies that each has put in place, and their relative performance. We conclude that a simple policy choice between liberalization or regulated monopoly is not sufficient for either cotton sector to achieve desired performance in the absence of rural input and credit markets, and identify the elements of joint public/private strategies necessary to improve performance in each country.

Cotton Sector Performance in Seven SSA Countries

Two key performance dimensions for any agricultural commodity chain are 1) the levels of productivity and quality achieved throughout the chain, and 2) the extent to which it pays farmers a competitive share of the chain's total value-added. We focus on these two dimensions to develop a simple graphical assessment of the performance of seven SSA countries over the harvest years 1995 through 2002. The first performance dimension is generally associated with *coordination* of activities throughout the chain, while the latter typically depends on *competition* among firms for seed cotton purchase. Thus, this assessment may also shed light on the extent to which countries are balancing the frequently conflicting needs for both competition and coordination.

In Figure 1, the horizontal axis measures *mean gross export value per hectare*, and is the multiplicative result of indicators of farm-level productivity (seed cotton yield), productivity in processing (ginning outturn ratio), and lint quality (premium or discount relative to the Cotlook Index A benchmark price). The export value achieved depends on the effectiveness of short-term coordination within production and marketing seasons, and also the success of the country over time in supporting research, extension, varietal zoning agreements, and other dimensions that provide the base for productivity and quality. To simplify the presentation, we use the average export value per hectare for each country over the eight years in our analysis. Our vertical axis is the *producer price share* of the sales price realized by ginning companies when they export cotton lint. Both the mean and range in producer price share are plotted for each country.²

Figure 1 is broken into quadrants using median annual values of export value per ha (US\$134/ha) and producer price share (0.473) for all seven countries over the 1995-2002 period. Countries in the south-west quadrant are the worst performers in each dimension, while those in the north-east quadrant are the best in each. Three patterns of performance emerge from this analysis:

- Mali, Benin and Zimbabwe achieved higher average export values per hectare than the seven-country median. This performance reflects effective vertical coordination, strong research and extension systems, and significant subsidies that have helped to maintain production levels during world market price downturns;³
- Zambia paid the highest average producer price share of any country over the period (0.566) while achieving an average export value close to the median. Tanzania achieved a slightly better average export value than Zambia, but with a markedly lower average producer price share;
- Mozambique paid the lowest average producer share of any country over the period, despite the advantage of coastal access, and achieved the second lowest average export value per hectare.

In the next section we focus on Zambia and Mozambique and take a closer look behind the numbers to better understand their contrasting performance.

A tale of two cotton sectors

Mozambique: from post-war recovery to regulated stagnation

Cotton production was introduced to Mozambique by the colonial government in the early part of the last century and grew to an annual average of 120,000 tons of raw cotton at independence in 1975. Immediately after independence production fell by two thirds, and continued to fall as a result of armed civil conflict to 10,000 tons in 1985 (Ofiço and Tschirley, 2002). Clearly, Mozambique initiated reform under very unfavorable circumstances.

The top of Table 1 lists the chronology and path of cotton sector reform in Mozambique. Following the end of the civil war, the government and private sector formed joint-venture companies (JVCs) to rehabilitate the cotton sector. In the absence of rural credit markets, JVCs were responsible for providing inputs and technical assistance to all smallholders wishing to grow cotton in their exclusive areas of geographical influence (termed “concessions”), and received long-term leases on land for direct production. JVCs were also responsible for road

maintenance and security. With the exception of minimum prices, determined each year through negotiations between the companies and government, JVCs were largely free of government involvement in their operations. The Mozambique Cotton Institute, part of the Ministry of Agriculture and Rural Development, is responsible for oversight of the sector and is funded in part by an export tax.

Although area cultivated and production increased very rapidly in the post-war period, almost reaching pre-independence levels in 1999, the impressive post-war recovery masks low and stagnant productivity and serious difficulties in implementation of the regulatory framework (see Table 1). New entrants have periodically challenged the geographical monopsonies of the JVCs and other licensed companies, resulting in intense price competition, serious credit recovery problems, and incidents of civil unrest. Attempts to partially liberalize the sector during the 2000/2001 season, by allowing farmer associations and/or communities to contract with the cotton company of their choice, were not successful in eliminating “pirate buying”. Lobbying by ginneries resulted in a return to clearly demarcated geographic concessions for all ginneries. Farmer associations were also denied their earlier right to negotiate with other companies, and the limited number of small competing firms are kept in line by the need for authorization from the concession company to market their raw cotton to third parties.

The focus of ginneries and policymakers on conflict resolution and minimum prices has detracted from technology development and the emergence of alternative sources of input supply. National average farm-level yields have stagnated at between 300-400 kg/ha, and a survey of 900 cotton farmers in Nampula found deficiencies in seed quality and technical assistance (Pitoro et al., 2001). No seed treatment is offered despite its proven effectiveness in neighboring countries. Though the Agence Française de Développement has been supporting two companies in varietal development and strengthening of farmer associations, no new varieties have been released.

Zambia's emerging success story

The bottom of Table 1 presents a chronology of key events in Zambia's cotton sector reform. Zambia's cotton sector was liberalized in late 1994 when the state monopoly (Lintco) was sold to two private companies. Cotton production had been trending downwards under Lintco and the company had accumulated debts, but the sector remained functional. Following liberalization, production rose from 20,000 mt to surpass 100,000 mt in the 1998 harvest year, and has averaged about 80,000 mt per annum since, nearly all by smallholders. During 1998-2000, exports of cotton and textiles were first among all agricultural exports in value (Export Board of Zambia, 2001). Zambia is unique among the countries analyzed in the almost complete absence of government in production, marketing, regulation, or direct financial contribution to the sector (Govereh et al., 2002, Zulu and Tschirley, 2002).⁴

The performance of Zambia's cotton sector compares favorably with its neighbors in Southern and Eastern Africa (SEA). Mean export values per hectare were well above those in Uganda and Mozambique, higher than Tanzania by the end of the period, and producer price shares exceeded those in all SEA countries. This success has been achieved despite historically low cotton prices in the world market over the past four years, serious problems of credit default during the late 1990s, and the departure in 1999 of the sector's biggest company, Lonhro.

The level of concentration among ginners in Zambia appears to be an important factor underlying the sector's relatively good performance under liberalization. Following the exit of Lonhro, two large companies (Dunavant and Clark Cotton) have between them maintained an 80 - 90% market share. Competition from smaller companies, from each other in one key producing area, and the lack of any government role regulating that competition, combine to encourage innovation in credit recovery systems, while the size and resources of the two large companies make it possible for them to innovate. Other countries with liberalized cotton sectors, such as Uganda and Tanzania, have been unable to sustain private sector input distribution on credit because of the intense rivalry in seed cotton purchase between many competing buyers, none with a dominant market position. Zimbabwe, where the private sector has also achieved

good credit recovery in a liberalized environment, had until recently only three ginners, and one of these had a 70% market share (Tschirley and Zulu, 2002).

The Dunavant Distributor System is good example of private institutional innovation under liberalization. The company has no extension agents; instead, independent “Distributors” contract with the company to receive inputs on credit and deliver them along with extension assistance to farmers. Distributor’s earnings are a function of credit recovery; to maximize their earnings, Distributors must balance the number of farmers against the probability of repayment. Under the system, credit repayment rates for Dunavant rose from about 60% to 85% by 2001. Yields rose from 450 kg/ha to 600 kg/ha.(See Zulu and Tschirley, 2002 for more detail).

The gap in export value per hectare between Zambia and Zimbabwe suggests that there is significant room for improvement in the former. Until recently, Zimbabwe had a number of advantages in terms of functioning credit and input markets, a legal system that enabled the recovery of assets from credit defaulters, and a strong public research system. Improved varietal development, dissemination, and maintenance could significantly improve Zambia’s competitiveness, but will require effective coordination within the sector backed by substantial financial resources over long periods of time. In the current international market environment, adequate funding will be difficult to ensure through levies on the private sector.

Implications for improved competitiveness of SSA cotton sectors

Cotton is critical for improving rural household incomes and facilitating the emergence of a viable commercial smallholder agriculture in SSA. Demand from spinners within SSA is likely to expand due to the opening of developed country markets for cloth and garments made in Africa. But in an environment in which SSA competitiveness is undermined by subsidies to developed country cotton farmers, a proactive approach to private/public partnerships is necessary to maintain and improve the profitability of cotton for producers and ginners alike. A mix of public and private goods and services will be needed to resolve endemic rural credit market failure, acquire and diffuse technical innovations, and ensure the necessary coordination

to meet the strict quality requirements of modern spinning and weaving technology. How to proceed?

First, in the presence of rural credit and input market failure and weak contract enforcement, liberalization appears to be most effective when the ginning sector is relatively concentrated. Yet this concentration can have negative implications for rural poverty reduction if it depresses prices to farmers (Tschirley et al. 2002, Badiane et al 2002). This suggests that governments have an important role to play in monitoring sector performance.

Second, governments and donors should exploit the capacity of private sector companies to deliver public services without expecting them to do so free of charge or diverting them from commercial principles. In Mozambique, the Cotton Institute in collaboration with the European Union, has recently launched a competitive grant program to enable cotton companies to facilitate diversification of smallholder crop production and marketing (MADER, 2001). The program is motivated by the fact that the extension and input distribution networks of the companies provide a delivery channel for non-cotton crop production technologies at lower cost than establishing new channels. The companies are encouraged to partner with NGOs and other organizations with capacity in farmer association development and marketing, and crop production technology development and transfer.

Third, while projects aimed at diversification will bring benefits to smallholders in cotton growing areas, they cannot substitute for technical and institutional innovation in the cotton sector itself. Innovation requires both funding and private incentives. Funding is urgently needed in Mozambique and Zambia in three areas: 1) investment in development and multiplication of new varieties, 2) improved pest management, and 3) updated raw cotton grading systems. In Mozambique, incentives for private innovation may have been reduced when the country returned to a rigid concession system with no rights by farmer associations to deal with any but the existing concession holder.

Fourth, to achieve effective mixes of public and private provision it is important to engage all actors in a dialog to build institutional and policy environments that encourage

technological renewal. Mozambique's experience shows that a high level of policy-induced coordination is a necessary but not sufficient condition for innovation where participation is imbalanced and dialog is not transparent. Two new institutional innovations that might help are 1) incentive-driven performance contracts between government and the cotton companies with transparent reporting of results, and 2) the transfer of government's shares in JVCs to farmers, with support from a cotton trust to act on behalf of the new farmer shareholders.

Finally, both countries need seriously to assess the potential impact of Bt cotton on profitability for smallholders and cotton companies. Work on this issue in Zambia in 1999 was abandoned due to the lack of a biosafety regulatory framework; an effort by top public and private agricultural sector leaders in Mozambique to begin testing in 2002 failed to make progress for the same reason. A key step forward in each case would be to recognize that biotechnology in a non-food cash crop like cotton raises fewer controversial issues than it does in maize, and to move forward with a "fast-track" framework that would allow the testing of Bt cotton.

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Figure 1. Plot of mean cotton export value/ha against mean producer price share for seven countries of SSA, harvest years 1995 - 2002

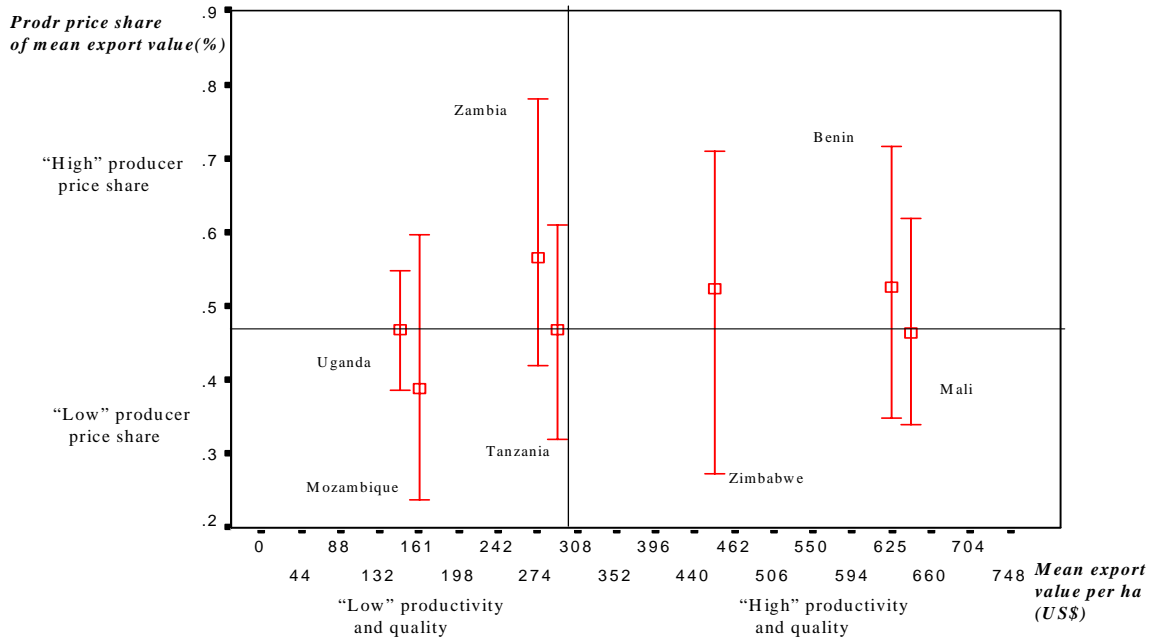


Table 1. Summary chronology of cotton sector reform in Mozambique and Zambia

Year	Event/Action Taken	Comments
----- Mozambique -----		
1975-89	Independence, nationalization, civil war	Cotton production collapses from average of 138,000 mt seed cotton 1972-1974 to under 20,000 mt 1986-1988.
1989	Three Joint Venture Companies awarded "concessions" in north of country	Seed cotton production is relaunched after falling to a low of 15,000 mt/year over past four years
1989-95	JVC model with closed concessions remains dominant approach in the sector	Seed cotton production rises to over 50,000 mt in 1995, due primarily to area expansion. Sporadic problems of credit default.
1996-99	Three private companies awarded concessions	Seed cotton production surpasses 100,000 mt in 1999 on large increases in number of smallholder producers and area. Yields remain stagnant around 300-400 kg/ha. New entrants without concessions create major credit default problem.
1998	Producer associations with ≥ 20 ha cotton allowed to contract with cotton company of their choice	Measure taken in response to, helped fuel, rapid growth in farmer associations. Many contracted with cotton companies for more favorable terms. New entrants formed large fictitious associations to purchase within concession areas.
2000	Government announces "open concession system"	Credit default problems continue. Major outcry from concession holders threatening to leave the sector.
2001	Government returns to closed concession system, awards concession to largest new entrant, eliminates right of associations to freely contract for input provision.	Farmer associations report that concession companies discontinue pricing premia. Indications of continued credit default, unrest among farmers.
----- Zambia -----		
1977-94	State-owned LINTCO runs single channel cotton system	Production trends downward from mid-1980s but does not collapse. Public debt accumulates.
1994	Lintco sold to private companies Lonrho and Clark Cotton	Companies operate for two years in separate areas of country. Production booms, aided by high int'l prices.
1997-99	Four new ginning companies enter market, independent traders also emerge. Government does not intervene	Combined Dunavant and Clark market shares fall to 80%. Competition increases. Charges that new entrants provide few if any inputs to farmers. Credit recovery falls to < 60% during 1997/98.
1999	Lonrho, citing input credit losses of US\$2m, leaves Zambia. Assets purchased by private company Dunavant.	Lonrho had begun to launch "Distributor System", Dunavant (under same management) continues to develop it. Credit recovery rises above 60%.
1999-2001	Dunavant fully develops Distributor System.	Credit recovery improves to 85%. At least one recent entrant falters but does not leave market.
2001/2	Drought in southern areas of country	Indications that credit recovery rate decreased
2002	New government enters late 2001, launches "Food Security through Cotton" program mid-2002	Program still taking shape. Publically funded credit line for input provision, being developed in collaboration with ginners. First direct government involvement in sector since 1994.

ENDNOTES

¹ ICAC estimates that subsidies reach 50% of world prices in the USA, 20% in China, and over 100% in the EU.

Elimination of U.S. subsidies would raise world prices by US\$0.12/lb.

² Price share varied much more for each country than did export value per ha.

³ Subsidies in Zimbabwe include a 30 year loan from the World Bank to the Cotton Marketing Board in 1992, and financial injections from government as late as 2001. Farmers in WCA received subsidies US\$50m-60m during the last cropping season (Badiane, et al., 2002)

⁴ The Cotton Development Trust has to date focused on technical issues. Mulungushi Textiles is a joint venture between the governments of Zambia and China (Mainland), but has a very small market share and has no coordinating or regulatory role.