Quality Standard-Setting in the Global Cotton Chain and Cotton Sector Reforms in Sub-Saharan Africa

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This paper is part of an ongoing research of the global commodity chain for cotton focusing particularly on the effects of liberalisation and restructuring of the cotton sectors in many African cotton producing countries and current changes in the global cotton market. It is the third in a series. The first paper (Larsen, 2002) explores the Zimbabwean cotton sector after the onset of market liberalisation and privatisation of the former parastatal in mid-1990s. In particular it focuses on how important aspects of earlier systems of coordination have been maintained, preventing downgrading of Zimbabwean cotton lint after liberalisation. The second paper (Larsen, 2003) concerns the Tanzanian cotton sector in a post-liberalised era. The Tanzanian cotton sector presents a major contrast to the Zimbabwean counterpart. A large number of private companies entered the market in primary purchase, ginning and sales of lint, which undermined provision of inputs on credit to smallholders, while production and quality declined during the 1990s. The present paper takes a broader focus by examining developments in the international cotton market - notably recent developments in lint quality calibration and the significance of lint quality in end-markets - and the implications of this for African cotton producing countries. I am indebted to Peter Gibbon and Niels Fold for their valuable comments on earlier drafts of this paper.

Keywords:

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Abstract

Cotton is one of the rare recent agricultural success stories in Sub-Saharan Africa. Production has increased twice as fast as in the rest of the world over the past two decades and the continent has become the world's leading tropical region for cotton exports. Meanwhile, most public monopolies have been progressively abolished through privatisation and liberalisation, although to varying degrees. This paper focuses on the cotton-marketing chains originating in different Anglophone and Francophone countries. It considers the implications of restructuring and liberalisation for quality control procedures and provision of inputs as well as their consequences for the (group of) countries' respective position in the world market. It is argued that the differences between cotton sectors in terms of safeguarding the reputation of the national crop is - to a large extent - a consequence of the ability of their private players to maintain product quality, and of whether some form of private coordination has emerged as a 'substitute' to the former state-coordinated quality control and input supply systems.

Introduction

Agricultural marketing policies have changed substantially in most Sub-Saharan African countries since the introduction of structural adjustment and liberalisation in the 1990s. In Eastern and Southern Anglophone Africa, parastatal cotton marketing boards have been dismantled and private companies now dominate input supply, ginning (a simple mechanical process where lint is separated from seed) and marketing activities. The Francophone countries are still highly regulated, although here private companies have also entered at the ginning and marketing level and all countries are under increasing pressure to liberalise. Meanwhile, an animated debate has emerged over the nature of the changes brought about by market liberalisation. In general, it is accepted that policy changes have led to more efficient flows in the marketing channel and that farmers have benefited from prompter payments and now receive a higher share of the export price than they did before liberalisation - trends noted in different countries and for different export crops. On the other hand, one of the key issues in the current debate is whether crop quality and correspondingly, relative unit prices, has deteriorated as a result of the dismantling of the single-channel marketing systems.

An argument frequently advanced by the more pro-liberalisation literature is that 'producers, exporters and importers alike have adequate incentives to maintain minimum quality standards' (Gilbert and Tollens, 2002:4). It is further stated, that if export quality (and hence price premiums) does fall following market liberalisation, this would indicate that in the pre-liberalisation marketing system, parastatals were demanding too high quality level, than that for which the market was willing to pay. In this way, any recent changes in quality are a result of what industrial end-users are willing to pay for the product, i.e. market-driven (Gilbert and Tollens, 2002; Baffes, 2002).

In this paper, I argue that whilst this line of thought perhaps has some merit in relation to other agricultural export crops where there is a world-wide erosion of quality premiums (e.g. in the cocoa-chocolate chain[1]) recent changes in lint quality emanating from Africa are not as much a result of end-market 'demand' as of a failure to transfer quality control and input supply from public institutions to the private sector in most post-liberalised markets. Management of lint quality has actually become more important in the spinning market due to technological developments and increased competition, and spinners have imposed new demands for quality as well as for greater accuracy of assessment of fibre properties upstream[2] in the chain. At the same time, not only do premiums and discounts attached to internationally traded lint persist, but they derive (partly) from the reputation of *national* origins and once the reputation of a national crop has suffered it becomes difficult for it to re-enter or re-gain a specific market segment. Thus, in order to safeguard the reputation of the national crop, some kind of collective action – private and/or public coordination – is required in order to prevent the liquidation of public goods (i.e. quality reputation) and to ensure that short term interests do not undermine the long term profitability of the sector.

The paper examines developments in the international cotton market and the impact on African cotton producing countries through a Global Value Chain (GVC) approach. Since the approach was elaborated by Gereffi (1994) in the mid-1990s, the notion of chain governance structure has received much attention. Governance structure is defined as the 'authority and power relations that determine how financial, material and human resources are allocated and flow within a chain' (Gereffi, 1994:97). Some agricultural commodity chains tend to fall into what Gereffi defines as 'buyer-driven' chains, in the sense that buyers (in form of large retailers or merchandisers) perform the 'lead' coordinating role and shape the barriers to entry in the chains. At least for coffee and cocoa, recent studies[3] suggest a move towards increasing buyer-drivenness during the last two-three decades. The dismantling of the international coffee and cocoa agreements in the early 1980s was followed by the emergence of large retailers and/or branded merchandisers as the key agents in organising and coordinating the global chains. In other words, in the cocoa and coffee chains there are clear 'driving' agents/lead companies who are able to 'control the definition of the functions that other agents in the chain should perform' (Gibbon and Ponte, forthcoming). For instance in the global coffee chain, to use Ponte's words, 'the strategic decisions by coffee roasters in the last ten years have shaped barriers of entry not only in the roaster segment of the chain, but also in

[1] As noted by Fold (2002), as a result of new processing technique used by industrial consumers (grinders and chocolate manufactures) it is now technically possible to compensate for variations in cocoa bean quality, although within certain limits. Thus, intrinsic quality (and national origin) has become less important in the cocoa-chocolate chain (see Fold 2002 for a detailed discussion).

[2] 'Upstream' refers to proximity to the source of the chain, i.e. production of seed cotton. 'Downstream' refers to proximity to end-markets (i.e. spinners).

[3] See among others Fold (2002); Gibbon and Ponte (forthcoming); Ponte (2002); Raikes et al. (2000).

other segments upstream. The adoption of supplier-managed inventory has added new requirements that international traders must fulfil to be part of the game' (Ponte, 2002:254).

In the global cotton chain, however, control or 'drivenness' is less pronounced or less clearly imposed by a single group of agents in the chain. As will be elaborated in this paper, the relatively low level of drivenness and lack of any clear 'lead' agents defining and shaping the division of labour and entry barriers along the chain seems to rest upon specific features of the global cotton chain. One important feature is that there has been no marked trend towards global concentration, either in the trading segment nor immediately downstream in the spinning segment. This in turn reflects continued geographical fragmentation in cotton production and consumption world wide. A second, related feature is the large number of different cotton qualities produced (national origins) still recognised in end-markets (Heijbroek and Husken, 1996). International trading companies continue to play the traditional intermediating role between producers (ginning companies) and consumers by combining supply of a variety of qualities and grades with operation on a bulk basis, enabling economies of scale in market information (production and consumption markets), transport and storage. Although spinners increasingly impose new demands for detailed calibration of lint fibre properties upstream in the chain, international trading companies have so far resisted taking on or performing any new roles or functions (e.g. upstream quality management prior to sales to spinners) and the division of labour between ginning companies, trading companies and spinners has remained largely unchanged for several decades.

In this context, the relationships between the different agents in the chain continue to be of an 'arm's length' kind, based on temporary contract-based relations with particular suppliers and consumers and basically involving only the exchange of cotton lint (Daviron and Gibbon, 2002). To a large extent too, the coordinating mechanism of the chain is based on market principles (or market governance) as prices alone contain relevant information on lint fibre properties and hence serve as unambiguous signals of lint quality. Historically, this has been facilitated by the institutionalisation of an 'universal' cotton classification and grading system which has made quality information widely available through standards that can be understood and relatively easy verified by both producers and end-users (predominately by visual inspection of samples until recently). Contractual and pricing arrangements have been (and still are) supported by an institutionalised dispute settlement mechanism operating on a global scale. Samples from national lint standard grading boxes are distributed and kept at third party dispute settlement organisations such as the Liverpool Cotton Association (LCA), and these standards are used as point of reference in arbitrating dispute cases[4] (*pers. comm.* 2003).

[4] More than 60 percent of internationally traded lint is traded under the LCA's rule and by-laws and LCA keeps boxes for nearly all national origins traded internationally.

As quality parameters to a large extent determine prices obtained in international markets and as quality is the main source of differentiation in end-markets, quality management is perhaps the most important performance criteria that supplying countries have to match. As elaborated in detail below, the emergence of different types of cotton market organisation and coordination in Sub-Saharan Africa has had significant repercussions for the preservation of quality from farm level downstream, and hence for the premiums and discounts attached to lint exported from different national origins.

The paper starts with an outline of the global cotton market, focusing on the structure of world trade, price developments, and the function of international traders as bridges between spinners and ginners/exporters. It then discusses recent developments in lint quality calibration, the (changing) significance of lint quality in end-markets and the implications of this for international traders' and spinners' sourcing strategies in producing countries. Against the background of these considerations, the paper explores recent changes in the role of various Anglophone and Francophone cotton producing countries[5] in the world market. This reflects experiences with different types of cotton market organisation and coordination since the implementation of market reforms in the mid-1990s. This leads to some general reflections on the importance of quality attributes, the role of quality considerations in countries' respective positions in the world market (different market segments) as well their role in the longer-term development of cotton sectors[6].

The global cotton market

Production, trade structures and prices

Cotton is one of the rare agricultural products where both production and consumption is more or less global in extent. There are more than 70 cotton producing and exporting countries, while many developed and developing countries depend on imports of lint for their spinning/textile industry. World wide cotton production and consumption has increased significantly during the last four decades, from 9.8 million tons in 1960/61 to 18.5 million in 1998/99 and reached 21.1 million tons in 2001/02[7] (Badiane et al. 2002). The majority of world cotton production, however, is located in the developed world where the USA is far the largest producer. Other major national producers are China, India, Pakistan, Uzbekistan and countries in (Francophone) West Africa. Around 30 percent of world production is exported

[5] Zimbabwe, Zambia, Tanzania and Uganda in the Anglophone region and Mali, Cote d'Ivoire, Benin and Burkina Faso in the Francophone region.

[6] Part of the paper is based on interviews conducted with Liverpool-based international trading companies engaged in cotton purchase in Francophone and Anglophone countries as well as the Liverpool Cotton Association and Cotton Outlook. The latter company is the founder of the Cotlook A Index, the principal measure of international cotton prices (see below).

[7] The international market season begins August 1st and ends July 31st the following year.

internationally every year, and four dominant exporters – USA, Francophone Africa, Uzbekistan and Australia - account for more than two-thirds of exports. The past decades have been characterised by major shifts in trade flows as a result of a geographical shift in international cotton yarn and fabric production. The main cotton trade flows are now from the four main exporting countries/regions, to countries in Asia. The latter region has become the leading importer of cotton in line with its expansion in spinning and textiles. This is especially true of Thailand and Indonesia. Asia's import share has expanded steadily, from 35 percent at the beginning of the 1980s to 46 percent in 1995. In general, the structure of lint imports is less concentrated than exports. Eight countries - Indonesia, India, Mexico, Thailand, Turkey, Russia, Italy and the Republic of Korea – accounted for half of world imports in 2000/01 (Heijbroek and Husken, 1996; ICAC, 2001).

Although cotton remains the world's most important fibre in textile production, with a share of about 40 percent in recent years (Badiane et al. 2002) world cotton prices have been under intense pressure with a downward turn since the mid-1990s (see figure 1, below). The instability and significant downward trend in prices are caused by a number of factors. Firstly, fluctuation in world marked prices is influenced by unpredictable fluctuations in production in and export from India, Pakistan and China. All three countries are major cotton producers but they are also major consumers of their own cotton, hence lint is only exported when the cotton harvest is larger than domestic demand. China in particular, is the main 'swing' factor in world cotton trade and therefore has a very strong impact on cotton prices. In the end of the 1990s, the country became a net exporter after several seasons of high imports and negligible exports and as a result of the on-going reforms in Chine, exports are likely to continue to increase[8] (ICAC 2001).

Secondly, cotton prices have been pushed down by increased government support to cotton exporters, notably in the USA[9]. Cotton producers in the US receive support payments through various programs, but their scale has increased notably with the introduction of the 2002 Farm Bill. The latter ensures that farmers receive at least 52 cents per pound lint, despite much lower world market price (Minot and Daniels, 2002). This has led to increasing production in and export from the USA, from levels that were already historically high. In 2001 consequently, the USA reported record cotton production and near-record export volumes, accounting for 30 percent of world export. According to one estimate, Africa is losing US$300 million a year because of export subsidies, especially those of the USA (Oxfam, 2003). Other estimates suggest, that the removal of US subsidies would led to a substantial

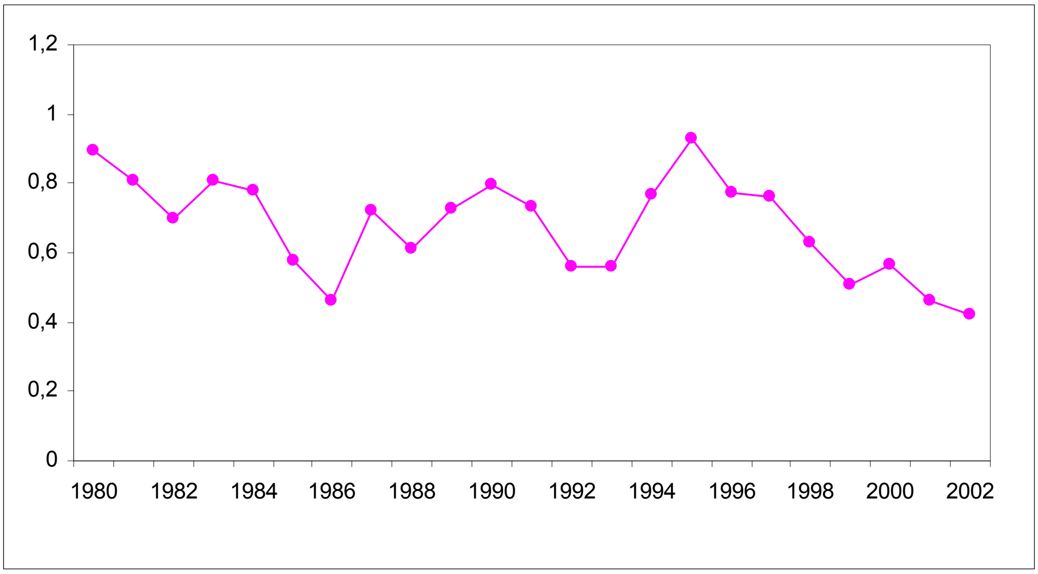
[8] Cotton imports by China averaged 680,000 tons per year between 1994 and 1998 and the country accounted for an average of 10 percent of world cotton trade in this period.
[9] Several other major producing countries – for instance China - subsidise cotton production. But cotton subsidies in China are likely to decline as a result of on-going reforms to meet requirements of WTO entry.

fall in US production, resulting in a rise in the international price in the short term by as much as 12 cents per pound (Badiane et al. 2002)[10].

Thirdly, the downward trend in world price has been closely related to the stock-demand ratio. World cotton demand has stagnated at approximately 20 million tons and stocks increased to a record of 9.8 million in the 1997/98 season in the wake of the financial crisis of 1997 in Asia (particularly in Indonesia, the Republic of Korea, and Thailand, which jointly account for more than 15 percent of cotton import demand). Cotton prices increased in 2000, but because of a 2001/02 world production of 21.1 million tons and consumption levels of only 19.9 million tons, prices remain under intense pressure. Levels of stocks will therefore reach a record level at the end of 2002, thus preventing much recovery in prices for the next couple of seasons. Finally, synthetic fibres have increased their share of the textile fibre market from 48 percent in 1995 to 55 percent in 1999 (Minot and Daniels, 2002:1), partly as a result of devaluations in several East Asia producing countries. This has depressed demand for cotton and cotton prices further (Baffes, 2002).

There are a variety of pricing systems for world cotton, but in general the Cotlook A Index is considered to be the most authoritative (Heijbroek and Husken, 1996). The A price Index is an index of the level of offering prices on the international market. The daily quotation is an average of the cheapest five quotations from a selection of sixteen upland cottons traded internationally[11]. Prices are expressed in US dollars (or cents) per lb, c.i.f. (cleared, insured and forwarded) for delivery at a Northern Europe port.

Figure 1: A Index prices, 1980-2002 (US dollars per pound)



Source: Cotton Outlook, op.cit. Baffes, 2002.

[10] Recently, Brazil has complained against the USA cotton subsidies in the World Trade Organisation (WTO) and requested a panel to be established in the Dispute Settlement Body of WTO. Benin has taken 3rd party status.
[11] US California, US Memphis, US Orleans, Australian, Brazilian, Tanzanian, Turkish, India, Sudan, 'Franc Zone', Uzbekistan, Greek, Mexican, Chinese, Paraguay, Pakistan.

Premiums and discounts above or below the A Index are obtained in relation to various components. For instance, higher or lower grades originate from different aspects of lint preparation – from crop management practices and agro-climatic conditions to type of gin technology – whereas other premiums are obtained as a result of inherited characteristics of the fibre (e.g. seed variety). Moreover, price premiums can be obtained according to a number of quality-neutral criteria including timing and forms of sales. It should further be noticed that premiums and discounts are not fixed but change according to overall supply and demand changes. The latter may increase or diminish the spreads between specific premiums/discounts, as well as the overall price spread. The A Index, however, does not reflect volumes sold at any one time, which may be small at the extremes of prices.

In addition to the A Index, there are quotations for coarser quality of cotton (the B Index), which is the average of the three least expensive of eight styles[12]. As figure 2 shows, although the B Index quotations moved more or less in tandem with the A Index between 1997 and 2003, price differentials between A and B index quotations seem to have widened in the last couple of seasons. The Cotlook B Index discount was 2 percent below the A Index in 1996/97, increased to 5 percent in 1997/98 and has averaged 10 percent below the A Index in the early 2000s.

Figure 2: Cotlook A and B Indices, 1997-2003 (US cents per pound)

Source: Cotton Outlook, 2003 (note: figures for 2002/03 until 31 January 2003).

Plentiful supply of subsidised US lint, as well as lint from China and more generally a saturated world market may have resulted not only in increasing downward pressure on prices but also to higher price differentials between high and low grade cotton. At the same time as price spreads between the A and B Index seem to have increased recently, the premium for extra fine cotton (represented by American Pima) over the A index was nearly 100 percent, or double the A index in 2000, compared with an average Pima premium during the 1990s of 70

[12] US Orleans, Brazilian, Uzbekistan, Indian, Pakistan, Turkish, Chinese, Argentine.

percent (Townsend, 2000). In other words, although poor quality lint may find a market even in the current situation of over-supply, lower quality is punished increasingly hard on price (the hierarchy of the various national origins will be returned to in the last section).

International trading companies

International trading companies play a key role as bridges between producers (ginning companies) and spinning mills, although it is also common for spinners to source directly from ginning companies in exporting countries. Nevertheless, the majority of internationally traded lint is handled by trading companies. The International Cotton Advisory Committee (ICAC) has studied the structure of world trade since 1994. In the list complied by ICAC every year companies are divided into four categories defined by their relative size: the group of largest companies defined as companies handling an estimated 200,000 tons a year or more; large companies handle from 50,000 to 200,000 tons; medium-sized companies handle between 20,000 and 50,000 tons, and finally smaller specialized companies handle less than 20,000 tons. According to the latest survey, 25 government organisations, 9 cooperatives and 442 private companies are currently engaged in the international lint trade (ICAC, 2002). Although the study only points towards minor overall changes since 1994, several new tendencies can be observed.

The number of *largest* cotton trading companies has remained steady at 19 companies (private or government owned), but these handled 39 percent of world production in 2000, an increase from 35 percent in 1994. Among the 19 largest companies in 2000, 16 are private or cooperative-based companies handling 35 percent of world production, as opposed to 14 companies handling 29 percent in 1994. In addition, the group of *large* companies has changed significantly since 1994. The number in this category fell from 51 - including 15 owned by governments - in 1994 to 43 companies including only 5 owned by governments in 2000. The volume handled by this group declined from 4.1 million tons to 3.6 million tons in 2000. Most of the decline took place in a group of large government (mostly African government) organisations as a result of liberalisation.

Thus, some concentration has occurred among the group of largest and large international trading companies and the number of privately trading companies and the volume that they handle have increased at the expense of state-owned companies. The majority of the large and largest international trading companies are either US-based (seven of the world’s largest cotton trading companies), Europe-based (mainly UK/Liverpool and Switzerland), Japanese or Australian (see table 1, appendix). Only smaller changes took place in the group of *medium sized* international trading companies. The combined volume (1.5 million tons) and number of firms (around 50) is unchanged but changes in individual companies comprising the group may have occurred. The last group representing *smaller* (and specialised) companies entailed 365 trading companies in 2000, handling 1.8 million tons (ICAC, 2002).

Another recent trend is that the group of largest and large trading companies (privately or government owned) expanded their operations significantly during the 1990s in terms of increases in number of supplying countries they purchase from and also upstream in terms of investments in ginneries and involvement in in-country marketing. This has happened in a context where many cotton producing countries in the southern hemisphere liberalised their markets and partly reflects a reaction to deregulation in those countries. After liberalisation of national cotton sectors, international traders have found themselves dependent on multiple, and often small- and medium-sized local private companies (as opposed to a few parastatals and/or Cooperative Unions prior to liberalisation). This has prompted international traders to become more involved in producing countries in order to assure constant supply of a variety of origins and sufficient volumes to spinners[13]. For instance, Hohenberg and Ralli, owned by Cargill, now own and operate ginning companies in Zimbabwe and Tanzania, while Reinhart established one ginning company in Tanzania and has joint ventures in companies in Uganda and Cote d'Ivoire. Another strategy entails development of long-term relationships with reliable local suppliers/ginners (or a combination of the two strategies) involving pre-finance of seasonal purchases (this will be returned to in the last section).

As already indicated, international trading companies are (still) the key agents in cotton trade and the functions they perform have remained largely unchanged for several decades. These functions are to act as intermediaries between producers/ginning companies and the immediate downstream consumer (spinners). Traders provide the services of purchasing when producers/ginning companies want to sell; bulk cotton supplies (volume and national origins) to provide lots demanded by spinning mills, hedge price risk and arrange transport to destination (Heijbroek and Husken, 1996). Although some consolidation in the trading segment has occurred during the last decade, trade is far less concentrated than in the international trade of other agricultural commodities. In the global cocoa-chocolate and coffee chains, international traders played a significant role until the early 1980s, but have either been marginalised by direct purchasing by lead agents downstream in the chain or have had to considerably redefine their role and take on the provision of additional services. At the same time they have gone through considerable restructuring and corporate concentration/ consolidation during the last two decades[14].

Why have international trading companies survived as key intermediate agents in the cotton trade? There are a number of possible (and interrelated) reasons. The first relates to the geographical and economic fragmentation in cotton production and spinning world wide, in

[13] Several of the large and largest international trading companies have initiated out-grower or input credit schemes to assure sufficient volumes of a particular national origin (see below).
[14] See for instance Fold (2002) on the structure of international cocoa trade; Ponte (2002) on that for international coffee.

comparison with other (or at least cocoa and coffee) global commodity chains. As mentioned above, both cotton producers and end-users are many and dispersed and according to Heijbroek and Husken (1996:47-48), it would be impossible for producers and consumers alike to oversee the entire market and perform all trade functions themselves. In addition, spinners tend to favour blends of different national origins and qualities in order to obtain the right blend demanded by variations in yarn quality (see below). Thus, spinners would have to invest considerable resources in obtaining market information and managing the sourcing process directly if they were to supply their own needs.

A second (related) foundation for the continued significance of international traders as intermediaries between producers and spinners is that, while performing the same range of tasks as traditionally, they have shown flexibility in expanding the scope of some of these tasks in parallel to spinners' changing preferences. As a result of falling lead times for spinning and textile producers and their desire to decrease stocks, spinners have increasingly 'out-sourced' their storage functions to the trading segment. According to some international traders, spinners now order supplies for more or less immediate delivery, as they have reduced their inventories from around six to less than three months (*pers. comm.* 2003). For traders, this implies securing greater access to pre-export storage and expending more working capital on holding large volumes of various national origins for a longer time as stocks have to be finance up to the moment spinners order supplies of a particular national origin. Thus, working capital costs (and financial risk) are increasingly transferred to international traders - who on the other hand reduce risks and increase cash flow by hedging on the futures markets.

Although spinners increasingly impose new demands for detailed assessment of lint fibre properties upstream in the chain, many international trading companies have been apparently reluctant to perform some kind of quality management prior to sales to spinners. The next section discusses developments in the arbitration of lint quality and the (changing) role of quality management in the global cotton chain as well as its implications for international traders' sourcing strategies in producing countries.

The notion of lint quality and fibre calibration

Cotton lint exhibits considerable variations in quality and tends to have multiple quality attributes, some of which are associated with seed variety and with crop management practices, others with post-harvest practises and with ginning. In general, 'fibre quality' is a complex of physical and microbiological properties like fibre length, fineness, maturity, strength, colour and trash content. The naturally wide variations in fibre quality, in combination with differences in end-use requirements result in significant variability in the value of cotton lint to processors. Therefore a system of premiums and discounts has been established to denote a specified ‘base’ quality (as represented by the Cotlook A Index, see above). In general however, cotton fibre value increases as the bulk-average fibres increase in whiteness, length, strength and micronaire (Bradow and Davidonis, 2000:35).

Until around the 1980s, lint properties were commercially assessed in a manner largely unchanged since the beginning of the century. An international cotton classification system was initially developed and promoted by the US Department of Agriculture in the 1920s and accepted as the base for an international grading system[15]. This ‘universal’ classification system was used as a reference for drafting national standards and grading systems (Daviron, 2002). Thus, lint traded on the international markets was differentiated according to national origin, by grade (according to colour, trash content and gin preparation) and by length. Generally, classification by *visual* and fairly simple measures of the fibre properties took place prior to sales on domestic or export markets, and public institutions (e.g. marketing boards in Africa) assured the quality of lint according to national grades. The variety of lint ‘products’ traded on the market was narrow and reflected the relatively low and undifferentiated quality requirements of the user industry (spinners) at that time.

Since the late 1970s however, spinners have searched continuously for improved consistency of fibre measurement and have imposed new demands for quality and for accuracy of assessment of fibre properties. This has followed from two (distinct but interrelated) developments. The first follows from technological development in spinning, e.g. automation of spinning processes. For instance, recent developments in high-speed yarn spinning technology make detailed measurement of the strength of fibres much more important, because the inherent breaking strength of individual cotton fibres is now considered to be the most important factor in determining the strength of the yarn spun from these fibres (Bradow and Davidonis, 2000). The second is related to increased competition in spinning and textile markets and follows from a move away from scale of relatively homogenous commodities to product differentiation (and more sophisticated textiles) as a basis for competition.

Against this background, the ‘old’ classification system provided only very limited information about the industrial relevant characteristics of fibre properties (Daviron, 2002:178). Manually operated instruments to measure strength and micronaire began to penetrate the commercial arena and became used in some contractual, pricing arrangements in some markets during the 1960s and 1970s. This laid the foundation for the development of a new system of mechanical classification, the so-called High Volume Instrument (HVI). The latter is able to measure virtually all main fibre characteristics - fibre length, micronaire, strength, trash content and colour (see box 1, appendix, for a description of the main fibre properties) - using only one automatic operation and in a very short time, giving users more exact descriptions of the relevant properties of the lint. The mechanical classification system

[15] See e.g. Daviron (2002) for a historical review of developments in (international) cotton standards.

was designed and promoted by the US Department of Agriculture during the 1980s and since 1993, samples from all cotton bales produced in the USA have been HVI calibrated and classified prior to sale. More recently, the entire Australian, Brazilian and Israeli cotton crop has been HVI calibrated, while HVI machines have been installed in several (African) developing countries.

Thus, assessment of fibre properties have to some extent changed from a subjective visual inspection of 'search' characteristics to an objective (technical and measurable) calibration of each bale of cotton. Apart from the availability of accurate and detailed information on the traditional fibre properties (grade and length) the number of measured properties has increased significantly, providing greater scope for differentiation of the cotton product traded on the market. As a result, batches of cotton can now be separated and sold to spinners on a more customised basis. This seems to suggest that classification of fibre properties is moving towards a more technical calibration of the industry-relevant properties of fibres. It also indicates a demise of the former classification system, where differentiation occurred mainly according to national origin and correspondence to a category defined by national (public) classification system.

Against this background, two tendencies are envisaged: firstly, a trend towards 'privatisation' of the arbitration of quality, where trade agreements are based on arrangements between individual companies and lint is supplied according to HVI specifications, using the universal (US) standard as a point of reference (Daviron and Gibbon, 2002). In this case, producers/ginners are able to by-pass or leap-frog international traders by selling directly to spinners and offering detailed HVI assessment of the quality of lint based on the spinners' demands for specific qualities. Some ginners/exporters, notably in the northern hemisphere, have taken on this function.

Secondly, there is a tendency towards reducing the role of quality management and control upstream in the chain now that, to use Daviron's wording, 'quality management can be based on *ex post* selection, that is, after agricultural production' (Daviron, 2002:181). For instance, lint contaminated by stickiness or neps which traditionally have caused major problems in the spinning process (and traditionally downgraded cotton with these properties on the world market) can – in theory - be blended into a mix which will be harmless for the spinning process, as long as the spinners knows the exact level of stickiness in the bale of lint (Mor, 2001).

Mechanical calibration systems in combination with improvements in spinning technology have to some extent facilitated a higher degree of substitution of different lint qualities at the spinning level and thereby increased the flexibility and scope to blend bales of different average fibre properties. As such, spinners may not only be able to reduce the costs of lint[16] but tend also to be less vulnerable to shortages of particular national origins. In this case, the ability to substitute higher quality lint with lower quality lint (and consequently declining quality premiums attached to higher quality lint) may support the argument touch upon in the introduction, i.e. that declining quality in cotton producing countries is a result of what spinners are willing to pay for the lint. Nevertheless, the degree of inter-substitution and flexibility in blend formulas is apparently lower relatively to for instance blends of coffee and cocoa, where processors (roasters and grinders respectively) have become decreasingly dependent on national origins and/or associated traditional quality standards[17]. According to international traders, some spinners are able to compensate for variations and/or substitution in quality and fibre properties, but most spinners normally favour specific blends of different national origins in order to obtain desired yarn properties. This is frequently referred to by international traders in terms of *'spinners are conservative – they don't want to change their blend'* (*pers. comm.* 2003). This 'rigidity' in substitution implies that there has not been any significant reductions in entry barriers in different spinning end-markets. At the same time, it also signifies that producers of seed cotton and lint may experience difficulties in regaining or re-entering a specific market-segment once the reputation of a 'national crop' has suffered and former customers have changed their blend. Thus, whilst the HVI system provides a potential means to calibrate strictly industry-relevant fibre properties, the reputation of national origins and preservation of quality upstream in the chain is still a source of differentiation in end-markets.

Moreover, uncertainties about reliability of test results and dependency of calibration of *samples* as opposed to assessment of the entire bale of lint add a further limitation to adaptation of HVI classification system in 'global' contractual pricing arrangements. It further points to the continued reliance on and the importance of the reputation of national origins as the main source of differentiation in end-markets. In relation to reliable test results, it apparently depend critically on calibration methods, procedures and samples and demands at least accurate control and/or measurement of atmospheric conditions, in particular relative humidity and temperature. Even if standardised procedures are followed, results are not necessary comparable when tested in different laboratories or at different points in time (LCA, *pers. comm.* 2003). A related issue concerns the degree of accuracy in test results for fibre properties such as colour, which somehow depends on the seed cotton variety[18] (national origin). As noted by an international trading company sourcing lint world wide: *'available*

[16] According to Hijbroek and Husken (1996), the cost of lint is the largest cost determinant in spinning; an average of 48 percent of total costs in the 1990s. Hence, spinners seek to mix the right blend of lint to meet processing (and final product) requirements at the lowest possible cost.

[17] According to Ponte (2002), new processing techniques have allowed roaster to substitute more easily some types of coffee with others and as a result 'roasters seem to be decreasingly committed to particular origins' (and less vulnerable to shortages of them) (Ponte, 2002:260). As already indicated, the same tendency is observable in the cocoa-chocolate chain, where grinders are able to compensate for lower level of quality through new processing technology (for details see Fold, 2002).

[18] Seed varieties developed for e.g. Africa are rather different from American ones, even though they are based on the same 'original stock'.

HVI machines are more suitable to calibrate colour grades on for instance American Upland, Australia and some African varieties [e.g. Zimbabwean lint] *than on lint emanating from Francophone cotton producing countries. In this case, results would turn out as grades below what the lint actually fetches on the world market'* (*pers. comm.* 2003). Doubts about the reliability of HVI results is one of the main reasons why some of the large international trading companies are reluctant to integrate this form of quality measurement as part of the services offered to spinners. Inconsistency in testing results is probably also the main reason why spinners still depend on the results obtained from HVI machine installed in their own mills, even though the lint has been HVI calibrated prior to sale.

Although HVI machines are able to measure average trash content (at the bale level) the accuracy is limited and measurement of contamination is still done by visual inspection or by a combination of mechanical assessment and visual inspection (LCA, *pers. comm.* 2003). In all cases, the assessment of contamination is based on samples that may not adequately represent or quantify the magnitude and distribution of trash in each bale of lint (Hunter and Barkhuysen, 1999). Meanwhile, according to the International Textile Manufactures Federation the overall level of contamination has increased during the last decades (ITMF, 2001[19]) at the same time as control of contamination has become more important for spinners because downstream yarn processing is increasingly performed by machines, which are not able to detect contamination or foreign matter let alone eliminate it. Among the most serious problems affecting the spinning industry world-wide appear to be stickiness (still) and the presence of different kinds of foreign matter (organic and inorganic)[20], associated with crop husbandry and agro-climatic conditions as well as post-harvest practices.

In the case of lint contaminated by insect honeydew deposits (which cause stickiness) insect droppings become randomly distributed on the lint in heavy droplets, cause costly disruption in yarn-spinning processes and may actually damage the processing machinery itself (Ethridge, 1998; Bradow and Davidonis, 2000). As noted by Bradow and Davidonis (2000:55) the cost of clearing and cleaning processing equipment halted by sticky cotton is so high that some international traders (on behalf of spinners) have included honeydew free clauses in purchase contracts and have refused cotton from regions known to have insect-control problems. In the case of foreign matter damage from for instance strings of polypropylene or small particles of leaves (referred to as pepper trash[21]) becomes visible only

[19] ITMF has conducted regular surveys since 1982 on spinners' perception of the problem of cotton contamination and foreign matter.

[20] Organic matter refers to leaves, feathers, paper, leather, strings made of jute, hessian etc. Inorganic matter refers to sand, dust, plastic film and strings/fabrics made of woven plastic (ITMF, 2001).

[21] Pepper trash significantly lowers the value of the lint to the spinner, and is more difficult and expensive to remove that the larger pieces of trash (Bradow and Davidonis, 2000).

after dyeing or at the time the fabric leaves the final finishing process. In this case it is too late to apply any remedy. Besides, as mentioned above, spinners normally favour blends of different national origins. In incidents of defects in yarn and fabric, spinners' possibility to establish the source of contamination, isolate a particular batch of contaminated lint and subsequently make claims against international traders and/or exporters are limited. According to the Liverpool Cotton Association and international traders, claims and arbitration about contamination are very rare, which partly reflects difficulties in identifying the exact source and national origin of contaminated lint.

In summing up, at least two sets of tendencies can be identified which might have significant repercussions for African cotton producing countries. Firstly, world cotton prices have declined persistently during the last decade and although current projections by ICAC indicate a slight recovery of world prices from their very low levels in 2002, the long-term trend for cotton (as for other traditional export crops) is of decreasing prices, primarily driven by increases in production throughout the world (Zulu and Tschirley, 2003). A second tendency is that detailed calibration of performance related properties of the lint and product differentiation have become increasingly important at the spinning level. At the same time and despite recent developments in mechanical calibration of fibre properties, certain kind of fibre properties remains 'experience' attributes - in particular degrees and types of contamination. As a result, international traders are more reluctant to source lint in countries which have a reputation of high levels of contamination. Since some forms of contamination are most easily checked at the first point of sale and since others can be best minimised by insistence on the use of specific packaging materials at the first point of sale, this suggests that quality controls at farm level remain critical. Meanwhile, producing countries obtain national reputations for higher or lower export crop quality and quality premiums (and discounts) in end-markets remain - to an extent - attached to *national* origins. Once the reputation of a national origin has suffered it becomes difficult to re-enter or re-gain a specific market segment. Thus, there are significant benefits for collective action in producing countries to ensure the reputation of the national crop and to maintain compliance with processing requirements at the spinning level.

Against the background of these considerations, the next section moves on to the African context. It starts with an outline of recent changes in the organisation of marketing systems in Francophone and Anglophone cotton producing countries in the wake of implementation of structural adjustment programmes. In particular, the focus is on quality control procedures and organisation of input provision to smallholders as two of the key issues in maintaining high lint quality. Against this background, quality outcomes will be discussed. The section ends with some broader reflections on possible changes in the (groups of) countries' respective positions in the world market, as a result of tendencies/developments in the 'global' cotton market and restructuring of marketing channels in the Africa cotton producing countries.

Sector organisation in Anglophone and Francophone cotton producing countries

Historically, cotton production was promoted in Africa through state monopolies, in Francophone West Africa by the French Government owned 'Compagnie Francaise pour le Development des Fibres Textiles' (CFDT) and in the Anglophone countries in East and South Africa, by parastatal marketing boards and/or cooperative unions. After independence in West Africa, the CFDT remained a shareholder in each 'cotton-to-textile' parastatal, while each parastatal benefited from a monopsony for purchasing seed cotton and most had a monopoly in ginning and marketing. The parastatals were responsible for organising virtually all services associated with cotton production and marketing, from research and extension to sale of the fibre.

As in the case of the Francophone region, the state-dominated single-channel marketing system was sustained after independence in the Anglophone region. Farmers were guaranteed fixed producer prices and output markets, prices were set in advance of each planting season on a pan-territorial and pan-seasonal basis while parastatal cotton boards or cooperatives had effective monopolies in primary purchase and ginning. In both regulatory regimes, governments attempted to overcome widespread credit market failure either by interlocked transaction where input credits were repaid by deducting their costs from the value of the seed cotton delivered to the ginnery or through offering various soft credit facilities[22]. Governments - through the parastatals or marketing boards - performed and managed the quality control system from primary marketing to ginning as well as coordinated sales of lint on domestic and export markets. As the parastatals had predictable volumes and qualities of seed cotton, they were able to sell on forward basis or via tender sales, thus capturing additional margins on the world market.

During the 1990s, public monopolies have been progressively abolished through privatisation and liberalisation, although to varying degrees. To a large extent, the Anglophone countries' cotton sectors have been fully liberalised and private companies now dominate input supply, primary purchase, ginning and marketing activities. The Francophone countries represent a contrast to their Anglophone counterparts, because the cotton sector continues to be dominated by state agencies (or managed coexistence between public and private companies), due mainly to vigorous resistance from governments in the region and from the French state-owned CFDT to liberalise the sectors (CFDT is still a major shareholder in all the Francophone African cotton-to-textile parastatals apart from Benin and Togo).

[22] For instance, the Zimbabwean parastatal cotton board did not provide inputs directly to farmers on credit, but credit was available through the Agricultural Financial Corporation.

Organisation of the cotton sector in the Francophone region

A comprehensive and efficient input-credit system in combination with extensive research in seed varieties suitable to local conditions as well as the provision of support services and infrastructure, have been largely responsible for the rapid expansion of cotton cultivation by smallholder farmers in the Francophone region, with high average crop yields (by international standards) and consistently good quality cotton. Production has grown five-fold over two decades, making the region as a whole the third (and occasionally second) largest current exporter of lint. At the beginning of the 1980s the Francophone region accounted for only 4 percent of total world exports, but approximately 15 percent of total world exports emanated from this region at the end of the 1990s (ICAC, 2001). In 2001/02 the region accounted for 13 percent of world cotton exports, second to only the US.

Nevertheless, the Francophone region is under increasing pressure to liberalise its cotton sectors as part of the World Bank launched structural adjustment programme and some recent changes have emerged as several countries have opened up for private participation at the ginning level and marketing of lint on export markets. The only country where cotton ginning and export marketing is still managed by a single company is Mali, where the parastatal 'Malienne pour le Development Textile' (CMDT) still operates a monopoly and structural adjustment programmes have not yet affected the production-marketing chain for cotton, except in a few marginal aspects. The CMDT still manages input distribution and credit recovery, but private companies are allowed to bid to import inputs and supply CMDT with them. Producer prices are still set by CMDT within the framework of a policy of price stabilisation. As a result, gains from increases in world market price go to CMDT, but when prices fall, the CMDT absorbs the losses, thus protecting farmers from sudden drop in income. However, the system in Mali has imposed heavy subsidy costs on the government and in recent years with decreasing world lint prices the CMDT deficits have piled up (Goreux and Macrae, 2003).

In the other major cotton producing and exporting countries - Cote d'Ivoire, Benin, Burkina Faso - the sectors are characterised by concentrated local monopolies, where the sector has been 'privatised' but not fully liberalised. In general, the former parastatals' monopsonistic positions have been broken by privatising (putting up for sale) some of the gins and/or allowing private companies to enter the ginning market. In Burkina Faso, a producers' association acquired a 30 percent share in the parastatal SOFITEX and it was recently decided to break SOFITEX's monopsonistic position by putting up two gins for sale. In Cote d'Ivoire, the CIDT was broken up into three companies in 1998. One is still jointly owned by the CIDT and the state (CIDT Nouvell) while the two other companies (with three ginneries each) were sold to private international trading companies[23] and granted geographical monopolies in

[23] L'Aiglon (see below) and IPS. The latter is a holding company based in Abidjan and owned by Aga Khan in partnership with Reinhart (Levin, 1999).

primary purchase of seed cotton. Hence, the quantity of seed cotton that a company receives is in principle determined by the level of production within its assigned geographic area (Levin, 1999). In Benin several private ginning companies exist together with the former (and somewhat reformed) parastatal and ginning companies are allocated seed cotton market shares proportional to their installed capacity. Hence in these countries there are alternative forms of administrative allocation of seed cotton. The sectors remain heavily regulated in all cases and producer prices are still set centrally; they are either announced before the start of planting or before the start of marketing of seed cotton - after negotiations between the government and the private sector.

The export segment, nevertheless, has become somewhat more competitive due to the entry of private (domestic and international) ginning and trading companies. Nearly all cotton lint produced in the region is exported, and a large share of exports is still marketed by the CFDT's affiliated trading arm COPACO (the 10th largest international trading company). Yet, COPACO has recently lost substantial market shares to new private trading companies, notably L'Aiglon (a Swiss-registered but Malian-owned company founded in 1994). L'Aiglon has established a major presence in West Africa and is COPACO's direct competitor now, and L'Aiglon is thought to have grown in recent years to become one of the largest trading companies world wide (ICAC, 2002:3). The company is currently involved in cotton lint trading in Mali, Benin, Togo and Cote d'Ivoire as well as ginning operations in the latter country. In addition, Reinhart operates ginneries in Cote d'Ivoire through a joint venture and the company trades cotton lint from the other major producing countries as well. Several Liverpool-based trading companies have expanded trade operations in West Africa, including Plexus and Bauman Hinde. Smaller and less know trading companies are also involved in cotton trade in West Africa, for instance Mambo Commodities, a relatively new trading company (founded in 1994), based in France and operating at least in Cote d'Ivoire, while a Singaporean trading (and spinning) company Olam International has extended its trading operations to Benin, Togo and Cote d'Ivoire.

As already indicated, the increase in cotton production in the Francophone region has been associated with national schemes that enable efficient provision of quality-inducing inputs (fertilizers and pesticides in particular) under favourable credit terms to smallholders. Despite recent changes at the ginning and export levels, input credit systems have been maintained in all but one country (Benin). Ginning companies, public or private, are expected to provide input credit to all cotton farmers in their respective concession areas and recover it by making deductions at point of sale (Badiane et al. 2002). This system can be preserved mainly because effective competition in seed cotton market shares among ginning companies does not yet exist. In Cote d'Ivoire, however, increasing conflicts between various actors in the sector may result in the collapse of the input credit system based on exclusive purchasing agreement within zones. According to Goreux (2002), one of the largest farmers' associations URECOS-CI (claiming to represent around 80 percent of the producers) expressed an interest to purchase one of the ginneries presently owned by the parastatal CIDT Nouvell, but failed to reached an agreement. Instead, the association build a new ginnery in 2002 and started purchasing and ginning seed cotton without having been allocated a zone (Goreux and Macrae, 2003:17). This appears to create an incentive for farmers to side-sell seed cotton in order to avoid repaying credit (and hence undermine the input credit scheme), although the results still remain to be seen.

The most far-reaching reforms have been implemented in Benin. Until 1999, private companies could obtain licenses to import inputs, but the parastatal SONAPRA remained responsible for distribution and credit recovery (as the parastatal continued to collect seed cotton and allocated agreed volumes among the ginning companies). Apparently, in order to reduce problems of rent seeking, responsibilities for bid selection and distribution of inputs were transferred from SONAPRA to CAGIA (a cooperative of producers) in 1999. But the 'de-linking' of the provision of inputs from seed cotton purchase and ginning created a major problem of credit recovery. The problem of side-selling was solved in 2000 when the CSPR (Centrale de Sécurisation des Paiements et des Recouvrements) became the sole agency responsible for recovery of credit. On the input side, the CSPR has to register every input sale from input providers to producer groups and every credit extended for purchasing these inputs. On the output side, it is mandated to register sales of seed cotton from each farmer group to each ginning company. Although there are several thousand village groups to monitor, the problem remains manageable because the data required can be collected from a small number of financial institutions, input suppliers and cotton ginning companies (Minot and Daniels, 2002; Goreux and Macrae, 2003). The system is based on the ginneries' geographical monopolies, and cotton farmers are not allowed to sell seed cotton outside the specified zones or to purchase inputs from suppliers of their own choice. Recovery of credit is carried out through a series of contracts between the private sector operators that are involved (via comprehensive regulation imposed on the players) and does not exclusively involve ginning companies in credit recovery.

Organisation of the cotton sector in the Anglophone region

In the major Anglophone cotton producing countries considered here - Zimbabwe, Zambia, Tanzania and Uganda - privatisation and liberalisation of the cotton sector have been completed. Two distinct market structures are observable within the cotton systems: Concentrated, market-based sectors (Zambia and Zimbabwe) and multiple small players (Tanzania and Uganda). In all four countries, private companies are allowed to compete for seed cotton market and ginning share and prices are determined by prevailing market conditions[24].

[24] Although the Cotton Board in Tanzania and the Cotton Development Organisation in Uganda announce a floor or indicative price before the marketing season starts.

Since liberalisation in the mid-1990s, the Zambian and Zimbabwean cotton markets have been dominated by a few large private companies. In Zambia, international companies entered the market in ginning and marketing when the former cotton parastatal was sold in two parts, one to the international trading company Lonrho Cotton (which subsequently sold out to one of the largest international trading companies Dunavant) and the other to Clark Cotton (South Africa). In the first few years after liberalisation competition in cotton purchasing was minimal as the companies operated in different areas of the country. Since 1997, the expansion in the national cotton production has attracted several other ginning companies and seed cotton traders, but the two companies still dominate the sector with a combined market share of 90 percent (Zulu and Tschirley, 2002). In Zimbabwe, the former Cotton Board (privatised in 1997 and renamed Cottco) remained the major player after liberalisation. Two other ginning companies entered the market, the international trading company Cargill and Cotpro (formed by a consortium of large-scale cotton growers and two French-based cotton trading companies). Cottco subsequently took over Cotpro in 2000, when it ran into liquidity problems (Larsen, 2002). Cottco and Cargill continue to dominate the seed cotton market with a combined share of 90 percent in 2000/01, but the sector has recently become less concentrated. Several new companies have entered the market in primary purchase and invested in gins, at least two established by domestic capital while the international trading company, Plexus, operates a ginnery through a joint venture with domestic capital (Hanyani-Mlambo et al. 2002).

Uganda and Tanzania are the only sectors where a large number of private companies entered the market in primary purchase, ginning and sales of cotton lint (multiple small players). In Tanzania over 20 new private ginneries had been built by 2002 and the number is still increasing (Maro and Poulton, 2002; Larsen, 2003). One of the results of this development is that total ginning capacity has now expanded to around three times the level of the highest seed cotton crop since liberalisation. The sector is characterised by a large number of small and under-capitalised ginning companies, with average market shares of less than one percent (Gibbon, 1998). Only one ginnery has been established in Uganda since 1994, but 23 ginneries that were formerly in cooperative hands have been rehabilitated or otherwise upgraded by new private owners (Poulton et al, forthcoming). Apparently, only two international trading companies are engaged in ginning in Tanzania and Uganda (Cargill built two gins and Reinhart one in Tanzania, while the latter company has a share in a ginnery in Uganda), but several of the largest international companies are engaged in trading of lint in both countries (Plexus, Baumann Hinde, Olam in Uganda; Cargill, Reinhart and Olam in Tanzania to name a few).

The liberalised cotton sectors in the Anglophone region have contrasting experiences in the area of quality control and provision of inputs. Again, a division between less concentrated (Uganda and Tanzania) and concentrated (Zambia and Zimbabwe) sectors can be made.

On paper, the former system of quality control has been preserved in Tanzania and Uganda, where buyers and ginners are obliged to purchase seed cotton on the basis of two grades AR and BR. In practice quality control at the primary level has broken down. High levels of ginning over-capacity have created a scramble for cotton among a large number of traders and ginning companies in the sector and a large number of buyers purchase seed cotton regardless of quality, forcing others to use the same strategy. In both countries, grading has disappeared at first point of purchase and different grades are purchased and ginned together. In Tanzania at least, the proportion of lower grade seed cotton is almost certainly increasing due to declining input use and mixing of cotton seed varieties since liberalisation[25].

In addition, competition in the seed cotton market has undermined the links between input supply on credit and output marketing, by increasing the scope for side-marketing by farmers. After a failed attempt to launch an input credit scheme by one of the largest private ginning company in Uganda, the Uganda Ginners and Exporters Association (UGEA) collectively initiated such a scheme in the 1998/99 season. The UGEA financed procurement of chemicals by a Bank of Uganda loan and the Cotton Development Organisation (a parastatal formed when the sector was liberalised) coordinated the distribution of cotton seed and chemicals on credit to smallholders (Gordon and Goodland, 1999). Ginning companies were responsible for loan repayment and each company paid a levy to the UGEA based on the volume of seed cotton ginned. Ginning companies were free to compete on seed cotton market shares (including seed cotton prices), while average unit input costs were deducted from the price paid to farmers. In this way the problem of side-marketing was formally avoided (ibid:28). However, a combination of a very bad season (in terms of weather conditions) and diversion of inputs by CDO staff resulted in very low production in the scheme's first year of operation. Only part of the loan could be repaid by ginning companies. The scheme was abandoned after the following season because it still did not yield the desired results (although the CDO's distribution system was more tightly monitored) and in the 2000/01 season, ginning companies provided inputs only on cash terms (Poulton et al. forthcoming).

In Tanzania, the Regional Cooperative Unions stopped providing inputs on credit to farmers (through the primary societies) a few years after liberalisation due to very low credit recovery rates. As the Regional Unions also reduced their input procurement levels while only a few private input traders entered the market, the availability of inputs was severely reduced. Gibbon (1998) estimated that insecticide use had probably fallen by two-thirds between 1994/95 and 1997/98. Recently, several new measures were taken by the Tanzanian Cotton Board to address prevailing problems in the sector. With effect from 2000, enforcement of statutory quality regulations and data collection at ginnery level was contracted out to private companies. Meanwhile, chemicals were imported by the Cotton Board and distributed

[25] Historically, seed varieties were developed to suit different sub-zones, but as cotton buyers moved across former distinct ginning zones in order to increase market share, different seed varieties suitable only for specific agronomic zones were mixed, as were disease and non-diseased seed.

through district and village government at a heavily subsidised price at least in the first two seasons of operation (1999-2002). Both initiatives are financed by levies imposed on the private sector, including the Regional Unions. The availability of chemicals has increased significantly as a result of this intervention, but probably at the expense of developing private sector supply. Moreover, since inputs are mainly available on cash terms the input scheme does not solve farmers' general problem of lack of purchasing power immediately before and during the season. Although the measures taken to enforce quality regulations may result in improved quality practices at the ginnery level, there is no evidence that this has lead to tighter quality control at the primary marketing level and enforcement of quality regulations is still afflicted by numerous problems (for a detailed discussion see Larsen, 2003; Maro and Poulton, 2002; Poulton et al. forthcoming).

The two concentrated sectors have performed better as a result of their greater ability to achieve coordination amongst private ginners. In Zimbabwe, a very elaborate grading system imposed by the Cotton Board prior to liberalisation was continued afterwards by the dominant companies in the sector (Cargill and Cottco). The National Cotton Council, a policy discussion forum representing all stakeholders in the sector, has played a vital role in coordinating quality control and grading procedures. The existing companies have committed themselves to follow common grading procedures, where classification and purchase of seed cotton is based on four different grades and a price premium attaches to higher quality seed cotton[26]. In both Zimbabwe and Zambia the problem of seed cotton contaminated by plastic fibres has to a large extent been eliminated. In Zimbabwe, all companies agreed to discount by the same amount seed cotton contaminated by plastic fibres and polypropylene-free bags were distributed (for rent) at every depot and buying post, regardless of ownership. The dominant ginning company in Zambia, Dunavant, refused to purchase any seed cotton that did not arrive at their buying posts in specified bags and the company has established cleaning stations at the entrance of the gins in order to remove polypropylene fibres (see Zulu and Tschirley, 2002).

Despite the entrance of other ginning companies in Zimbabwe, Cottco has continued to provide inputs on credit to smallholder farmers since liberalisation and its recovery rates have been remarkably high (above 95 percent over a number of years). Cottco's scheme has expanded significantly during the decade[27], covering approximately 70,000 farmers (around 28 percent of all cotton farmers) in the 1999/2000 season. The other major player, Cargill, operated an input voucher scheme until 2002/03 when the company decided to launch its own input credit scheme (covering 10,000 farmers), apparently for the first time in the company's long history of cotton trade and ginning worldwide. At least two new entrants have also initiated their own credit scheme, but emerging side-marketing has resulted in lower

[26] The NCC legislation committee has recently drafted a statue to reinforce grading standards, though this still needs approval by parliament (Larsen, 2002).
[27] The input credit scheme commenced in 1992/93 when the Cotton Board still operated a crop purchase monopoly.

repayment rates (Hanyani-Mlambo et al. 2002). Nevertheless, until recently these interventions had resulted in record levels of production of good quality cotton and rising yields for smallholder producers.

After the entry of several smaller buyers in the Zambian cotton market, Lonrho abandoned its input credit scheme due to increased loan default rates. Instead Lonrho (and subsequently Dunavant) launched a 'distributor system' where the company lent inputs to independent agents, who then themselves on-lent them to (selected) farmers. According to Zulu and Tshirley (2002), Dunavant had nearly 1400 distributors during the 2001/02 season, each working with an average of 40 farmers. The credit repayment rate has improved considerably from around 65 percent to 85 percent. With the exception of Clark Cotton (which continues to operate a 'traditional' input credit scheme) other ginning companies have followed an approach similar to Dunavant (ibid).

The brief examination of the case studies illuminates on the one hand that, although liberalisation has taken place in most producing countries, the results have not been uniform. Reforms went further in the Anglophone countries, but this have not necessarily led to high levels of competition between private companies as Zimbabwe and Zambia illustrate, although here too several new players have entered the sectors. On the other hand, different kinds of market organisation have different consequences for provision of inputs to smallholders and preservation of quality upstream in the chain to farm level. This – as will be elaborated in the next section – has significant repercussions for the reputation of the national crop in the world market and hence for the premiums (and discounts) attached to exported lint.

Possible changes in the (groups of) countries' respective positions on the world market

As mentioned earlier, premiums and discounts above or below the A Index are triggered in relation to various 'components' of quality, as well as by other factors. On the other hand, it is difficult to distinguish the precise balance between purely quality components and other quality-neutral components of prices at any one time. This is mainly because of the supply-demand balance positions of national origins during and between marketing season(s). In respect of purely quality components, different national origins can be categorised as belonging to one of four distinct quality 'classes' in the global cotton quality hierarchy: Extra fine cotton, fine and high-medium cotton, medium cotton (the A Index) and coarse count cotton (the B Index).

Figure 3: Outline of the global cotton quality hierarchy

Extra fine cotton (long staple)	
US Pima, Egyptian, Sudan, Central Asia	
Fine and High-Medium cotton	
(Strict Middling, 1-1/8")	
US SJV, Zimbabwean, Australian, 'Franc Zone'	
A Index: Medium cotton (middling, 1-1/32")	
Saw ginned cotton	*Roller ginned cotton*
US California	
US Memphis	
Australian	
	Tanzanian AR, 2
	Turkish (Izmir)
	Indian
	Sudan (Acala)
Brazilian	
US Orleans	
'Franc Zone'	
Spanish	
Uzbekistan	
Greek	
Mexican	
Chinese (329)	
Paraguayan	
Pakistan (1503)	
B Index: Coarse count cotton (Strict low middling)	
US Orleans/Texas	
Brazilian	
Uzbekistan	
Indian (J-43 saw gin)	
Pakistan (1503 saw gin)	
Turkish (Adana, roller gin)	
Chinese (527)	
Argentine	

Source: Adapted from Cotton Outlook (various years); ICAC (various years); Heijbroek and Husken (1996).

As figure 3 shows, only a few countries produce and export extra fine (long staple) cotton world wide. US Pima is the leader among the world's extra fine cotton, not least because it has an international reputation of contamination free relatively to the other major producing countries as Egypt and China (Suh, 2002). As noted above, the premium attached to extra fine cotton (as represented by US Pima quotations) averaged 70 percent above the A Index during the 1990s and nearly 100% or double the A Index in 2000/01 (see also table 2, appendix). In the category of fine cotton US SJV cotton stands as the superior quality followed by high-medium cotton represented by Australian, Zimbabwean and Franco-phone cotton. The premium for cotton lint in this category has average 16 percent above the A Index in the late 1990s and early 2000s (table 3 and 4, appendix). The majority of the world's cotton production tends to fall into the category of medium cotton quality defined by the colour grade (strict middling) and staple length (1-3/32").

As mentioned, medium cotton represents the 'base quality' and the A Index is based on an average of five quotations out of a selection of sixteen national origins – all with more or less similar colour grade and staple length. The majority of cotton produced in Sub-Saharan African is ranked as medium cotton, and as such competes not only with each other but also with cotton emanating from developed countries in end-markets. Hence, apart from timing of sales, specific national advantages (e.g. seed variety, gin preparation) as well as degrees and types of contamination are important competitive aspects in end-markets.

In general terms though, a quality premium is attached to lint emanating from African cotton production countries because it is hand-picked. This is because hand-picking theoretically reduces the incidence of for instance stain compared with machine-picked cotton from Australia and the USA. The latter generally contains more trash than hand-picked and the subsequent cleaning processes then necessary before ginning adversely affect the incidence of short fibres. In addition, as the African ginning process is relatively slow compared with its US and Australian counterparts, there is less stress on the fibre and the frequency of neps is reduced significantly (whether it is saw or roller gins).

Besides these general advantages of 'African lint' in the world market, Uganda and Tanzania have traditionally occupied an unique position in the world market as two of only a few countries exporting roller ginned lint globally[28] (see figure 3). Turkey and India, the other major roller ginners, consume a majority of the roller ginned cotton domestically. Roller gins as apposed to saw gins are superior in terms of maintaining fibre length during the ginning process, an attribute spinners have been inclined to pay a premium for. Until the cotton sector was liberalised in the mid-1990s, Tanzanian lint qualified for a premium of 5-7 US cents/lb for being roller ginned. After liberalisation, however, Tanzania (and to a lesser extent Uganda, see below) has lost this unique position on the world market. At least half of the new private ginneries installed in Tanzania are saw gins, which conventionally produce lower cotton quality – or rather, cotton to which no premium is attached *per se*. Thus, as a rising proportion of Tanzanian lint is saw ginned, Tanzania has lost part of its 'original' roller ginned premium (Larsen, 2003; Gibbon, 1998).

Perhaps more seriously, the former grading system at the first point of purchase disappeared in the mid-1990s and an absence of price differentiation between grades removed important price-based incentives for farmers to improve seed cotton quality and to grade properly before selling their produce. Poor harvesting practices and storage facilities at farm and buying post level are also prevailing problems in the sector and ones which cause serious contamination of seed cotton. This is reflected in lint quality and influences the broader reputation of Tanzanian lint and the premiums and discounts with which it is associated[29]. According to the latest ITMF survey (2001), Tanzanian lint is ranked as the twelfth most contaminated out of thirty national origins reported. Although poor(er) quality cotton may still normally find a market, it will be increasingly harder punished on price. In the Tanzania case its prevalence has led to a downgrading of the position of local producers/exporters on the world market. When a percentage of a country's output is of recognisably poor quality (as in Tanzania) this tends to drag down prices paid for the rest, even if this is of good quality, because of the risk that spinners/international trading companies feel they are taking (Shepherd and Farolfi, 1999). In other words, the reputation of Tanzanian lint has suffered and export has shifted to a lower market segment, as explained by one international trader:

[28] More than 80 percent of internationally traded lint is saw ginned.
[29] Although this fall to some extent has been mitigated by a premium associated with a time-specific 'market window' (Gibbon, 1998; Larsen, 2003).

> *'Tanzania has a reputation for very contaminated lint. The most serious problems are polypropylene and all sorts of foreign matters. The amount of trash has increased tremendously. Some of the spinners who traditionally used and required roller ginned lint from Tanzania have changed their blend – they have just experienced too many problems. So, demand for Tanzanian lint has declined (and hence with it the premium they used to get) and even though we are able to offer 'high' quality roller lint to our customers, they are more reluctant to purchase it now (...) Tanzanian has lost its reputation' (pers. comm. 2003).*

On the other hand, Uganda still occupies a special niche-market position by supplying mainly roller ginned lint (only four out of approximately 35 operational gins are saw gins (Lundbæk, 2002)) and according to international trading companies, the quality is still considered relatively high *vis-à-vis* Tanzanian lint. Nevertheless, due to relatively low (albeit increasing) lint production and a large number of ginning companies, it has become increasingly difficult for international traders to obtain interesting magnitude of lint. Under these circumstances, more spinners are likely to exclude Tanzanian and Ugandan lint from their blends. At least one of the largest international trading companies (Cargill) has recently lost interest in Tanzania. This company entered the market after liberalisation and built two large (saw) ginneries. It withdrew in 1998 because of the low quantity and quality of the national crop, returned again in 2001 (against a background of very high crop volume expectations and improved quality due to new initiatives by the state as mentioned above) but withdrew again in 2002.

The ability to maintain quality control upstream in the marketing chain is significantly higher in the Zimbabwean and Zambian concentrated market systems. In both countries, the majority of the ginning companies impose uniform grading procedures at the primary purchase stage, according to nationally defined standards. In Zimbabwe, the elaborate grading system (laid down by the now defunct Cotton Marketing Board) was sustained after liberalisation, while in Zambia the largest ginner (Dunavant) has recently added a superior grade (A+) to the official three grades (A-C). Price differentials between grades provide important incentives to farmers to aim for high quality seed cotton. Zambian Dunavant estimates that 60 percent of seed cotton purchased is graded either as A or A+ (op.cit. Zulu and Tschirley, 2002), while more than 80 percent of seed cotton emanating from farmers under Cottco's input credit scheme is in the superior A and B grades. At the same time, apart from preservation of a detailed grading system, the dominant ginners have taken a leading role in controlling or eliminating the problem of lint contaminated with polypropylene. These initiatives would have been much difficult to implement for a small company facing fierce competition to secure sufficient volumes of seed cotton in order to fulfil contacts with international traders (see below). Besides, obtaining agreements on uniform quality control procedures (as in Zimbabwe) is generally easier where there are fewer agents involved and where they have a greater chance of capturing the returns from investment in such measures.

Other factors behind the sectors' ability to maintain higher quality cotton lint is the nature of competition for seed cotton and composition of ginning companies relatively to its Tanzanian and Ugandan counterparts. The composition of companies in Zimbabwe and Zambia has already been touched upon, suffice it to say that the dominant ginning companies in these countries (two-three companies controlling around 90 percent of the seed cotton market) have made huge fixed investments in ginneries and/or developed input credit schemes in order to obtain sufficient supply of (high quality) seed cotton. Thus, they have a sunk cost in maintaining volume levels and grading procedures that will safeguard the reputation of the national origin. Until recently, Zimbabwean ginneries mainly competed around market coverage and provision of inputs, rather than on price. In Zambia, the two largest ginning companies (Clark and Dunavant) only compete in one province (and only against each other), while Dunavant has a dominant market position in the other provinces.

Against this background, Zambia and Zimbabwe have the most secure position in relation to crop reputation in the Anglophone region. Ginning companies are able to offer interesting volumes of a range of standardised and homogeneous lint quality endowed with traditional quality parameters whilst the risk of contaminated lint is significantly reduced. During the last decade Zimbabwean lint has commanded a premium around 10 percent above the A Index[30]. According to two international traders, however, the reputation of Zimbabwean lint as contamination free has recently been questioned by some Asian and South African spinners and apparently the premium has declined slightly. This might be associated with weather-related factors as the last two seasons have been drought years. On the other hand, this has happened at the same time as several new companies have entered the market in ginning and primary purchase, some of them apparently attracted to the sector by the prospect of 'easy money' due to the possibility since 2000 of arbitraging between the fixed exchange rate and the emerging parallel market[31]. This may point towards emerging difficulties in sustaining uniform quality procedures in a context where competition over market shares is increasing. It could also indicate that the price differentials between the higher grades (A,B,C) have narrowed, which may reduce incentives for farmers to grade properly before selling their produce (see Hanyani-Mlambo et al. 2003).

[30] Zambian lint is not included in the selection of national origins quoted in the A Index. However, some international traders suggest that Zambian lint obtain a significant premium above the A Index (see also Zulu and Tschirley, 2002).

[31] In 2002, while the official exchange rate stood at Z$55:US$1, the currency was trading at Z$1 250 to the US dollar on the unofficial parallel market (Hanyani-Mlambo et al. 2002). Although exporters have to exchange 25 percent of their earnings at the official exchange rate, they can be paid the remainder in US$.

Traditionally, cotton lint emanating from the Francophone region has either been of high-medium or medium quality. One of the key questions raised in relation to complete liberalisation of cotton sectors in this region has been whether unrestrained competition in seed cotton market shares and ginning may undermine quality control procedures throughout the marketing chain and lead to deteriorating quality of cotton lint (Levin, 1999; Goreux and Macrae, 2003). So far at least, the past practice for the (parastatal) ginning companies to impose publicly determined grades and classification procedures persists in all the Francophone countries, although private companies have entered the market in some of them[32].

At present, lint emanating from Francophone countries is still remunerated as of high quality. On average, Francophone cotton lint commands a 9.3 percent quality premium above the Cotlook A Index[33], where part of the premium derives from very low count of neps and short fibre content. Further, the region's lint has a reputation for (relatively) low levels of contamination. Obviously, this can to a large extent be ascribed to the fact that the former quality control system in this region is still preserved despite recent initiatives towards liberalisation. Until the export stage, the sectors are either completely controlled by a parastatal (Mali) or a few ginning companies including the reformed parastatals, and in no case is competition in the purchasing segment allowed. At the same time, although the ginning and export segment is more competitive now, international traders and spinners are still largely able to obtain interesting volumes of lint, as described by one trader sourcing lint in Uganda, Tanzania and West Africa:

> *'We have to distinguish between West and East Africa. It is much easier to purchase and trade lint from West Africa. In most countries - except for Ivory Coast because of the conflict at the moment - we are sure we get the right volume and we can rely on the quality standards* [i.e. less claims over quality] *so we can fulfil our contracts with spinners. We don't have to deal with a lot of smaller ginning companies and we don't have the same kind of risk associated with lint trade'* (*pers. comm.* 2003).

A wish to preserve quality, combined with West Africa's still unchallenged position as the major cotton producing region in Africa seems to be a strong incentive for international traders and spinners alike to increase sourcing in this region and probably also to rely less on lint emanating from at least Tanzania until the country regains its former position in end-markets.

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[32] Assessment and classification of seed cotton quality is carried out prior to ginning, according to three distinctive categories of grades and staple length.

[33] It is worth noting that there are significant differences between lint emanating from different Francophone countries and hence they obtain various prices on the world market. The A Index, however, only reports a 'West Africa' c.i.f. price.

In broader terms, tighter quality requirements in end-markets as well as the continued emphasis on specific national origins (and quality characteristics) are transmitted upstream to African producing countries and results in differentiation between countries. This differentiation is reinforced by issues of volume. Within cotton producing countries themselves one can further identify a secondary division or stratification between smaller ginning companies/exporters (often domestic capital) and larger companies (domestic and foreign/international capital) in terms of capacity to make remunerative sales agreements. As mentioned above, price premiums would normally be attached to forward sales agreements, but only those ginning companies/exporters who can guarantee interesting magnitudes of crop in advance can qualify to sell forward. In the countries characterised by numerous small and medium-sized ginners, it tend to be only the largest companies who are able to guarantee delivery some months in advantage. These companies often obtain lint prices above the market average and avoid the risk of high month-to-month fluctuations in prices.

In addition, partly as a result of high levels of competition in domestic markets, some international traders have become more reluctant to pre-finance seed cotton purchase against delivery of a certain volume of lint. Pre-finance arrangements between ginning companies and international traders (or spinners) have been a common solution post-liberalisation to absence of local financial markets. Since liberalisation however, high competition in primary purchase makes domestic purchasing prices unpredictable. Besides, seed cotton prices normally increases substantially during the marketing season, and this imposes constraints on smaller companies' possibility of offering competitive prices. Hence they are often not able to fulfil contracts with international traders. As a result, international traders are more selective in screening and monitoring ginning companies during the season in order to assure recovery of credit (in the form of lint).

Nevertheless, this is not to argue against (further) liberalisation and deregulation of cotton sectors in Sub-Saharan Africa. Clearly, whilst the former single-channel marketing system had several advantages (e.g. credit-based input systems for smallholders and maintaining national reputations on the basis of a single, mandatory system of quality control) it was also afflicted by several problems notably excessive taxation (as the Malian case illustrates), rent seeking and low producer prices. Note however, that the broader 'sector revenue' is not taken into consideration here. Investment in infrastructure (roads), schools and health care systems are an important component of national cotton industry activities in the Francophone region and may explain some of the difference in rations of farm prices to export prices. However, the case studies reviewed here suggest that the implications of further liberalisation of cotton sectors have to be considered thoroughly prior to additional opening of markets. Notably, as preservation of quality is a key parameter in end-markets this needs to be transmitted all the way down the marketing chain to farmers, as the average quality of seed cotton determines the maximum level of final quality product that can be achieved and hence the premium or discount obtained on export markets (Poulton, 2002:8). Experiences notably from Tanzania (but also to some extent Uganda) suggest that liberalisation should be preceded by the establishment of an effective regulatory framework and/or a strong (private) coordinating institution. Recent steps have been taken to re-regulate the cotton sector in Tanzania, while there are similar initiatives planned in Uganda and Zambia. In the Tanzanian case as argued elsewhere (Larsen, 2003), the measures taken so far to enforce quality regulations are broadly positive, but on their own they are insufficient to improve quality and reverse the reputation of Tanzanian lint on the world market, particularly in relation to level and sources of contamination. It is also clear that it is more difficult to re-regulate a sector after several years of unrestricted competition and characterised by a high number of undercapitalised small ginning companies than it is to establish an effective regulatory framework prior to liberalisation.

Concluding remarks

Although recent developments in mechanical classification (HVI) systems have increased the number of measured fibre properties as well as facilitated more accurate and detailed information on the traditional fibre properties, producing countries (still) command reputations for higher or lower export crop quality and quality premiums and discounts in end-markets remain attached to *national* origins. At the same time, most spinners are still dependent on the use of national origins and associated traditional quality standards as they tend to define desired yarn properties in terms of specific national origins. This implies that once the reputation of a national crop has suffered and former customers have changed the composition of their blends, it becomes difficult to regain a specific market segment.

As elaborated above, the management of lint quality has become increasingly important for spinners due to technological developments (e.g. automation of the spinning process) and increased competition. Despite recent developments in mechanical calibration of fibre properties, crucial fibre properties remain tested on an ‘experience’ basis because calibration is based on samples from each bale of lint and some properties – notably contamination – needs to be tested for more generically. In addition, there are uncertainties about the reliability of test results. In any case, international traders and spinners are reluctant to source lint in countries which have a reputation of high levels of contamination even if quicker and cheaper ways have been found to segregate more and less contaminated product. Hence, as tighter quality requirements in end-markets and the continued emphasis on specific national origins are transmitted upstream in the chain there are significant benefits for collective action in producing countries to maintain compliance with processing requirements at the spinning level and to preserve the national reputation.

Meanwhile, most public monopolies in Sub-Saharan Africa have been progressively abolished through privatisation and liberalisation. The Anglophone countries’ cotton sectors have been fully liberalised while the cotton sectors in the Francophone region continue to be dominated by state agencies, although also here private companies have entered the market in ginning and export. So far at least, however, public input supply schemes and quality control systems have been preserved in the Francophone region despite recent initiatives towards liberalisation. As such the region still occupies a position in the world market as a producer of interesting magnitudes of medium and high-medium quality cotton. Nevertheless, the region remains under pressure to liberalise its cotton systems as part of structural adjustment programmes launched by the World Bank.

The experiences of the Anglophone countries examined in this paper suggest that the ability to maintain quality control and to provide quality-inducing inputs on credit terms to smallholder farmers are significant advantages of concentrated market systems over markets composed of numerous small or medium-sized players. In Zimbabwean and Zambian concentrated market systems the dominant ginning companies operate input credit schemes as means of securing a sufficient supply of good quality seed cotton. In addition, the major ginning companies impose uniform grading procedures (with price premiums attached to higher quality seed cotton) and have taken coordinated initiatives to control the problem of lint contaminated with polypropylene. These initiatives would have been more difficult to implement in a highly competitive environment consisting of numerous small-sized companies as in the Ugandan and Tanzanian cotton sectors, as here each company's chance to capture the returns from investment in such measures is (relatively) lower. Thus, Zimbabwe and Zambian seem to have the most secure position in relation to crop reputation in the Anglophone region and lint emanating from the two countries still commands a quality premium in the world market. In contrast, the quality control system collapsed in both Uganda and Tanzania after liberalisation, as a result of a 'scramble for cotton' among a large number of small private ginning companies. At least for Tanzanian lint, the national reputation has suffered and prices now reflect a lower market segment, while in the Ugandan cotton sector, it has become increasingly difficult for international traders and spinners to obtain interesting magnitude of lint due to relatively low lint production and the latter's dispersal between a large number of ginning companies. In both cases, spinners are more reluctant to buy lint emanating from Tanzania and Uganda, at least until the countries have restored their international reputation (in terms of quality and/or production level).

Indirectly, the case studies examined in this paper also indicate that, although market liberalisation has taken place in most cotton sectors in Sub-Saharan Africa, the results have not been uniform and the dismantling of parastatal marketing boards has not *per se* led to higher levels of competition in ginning and marketing activities. More directly, experiences in the Anglophone and Francophone regions indicate that different kind of market organisation have different kind of consequences for provision of inputs to smallholder farmers and for the preservation of quality upstream in the chain at farm level. They also indicate that different kinds of liberalised market systems demand different kinds of state support and/or private sector coordination and collaboration. Some steps have been taken in Zambia, Uganda and Tanzania either to re-regulate the sector (Tanzania and Uganda) or to re-establish a form of national input credit scheme (Zambia). Given the problems of sectors characterised by numerous small ginning companies, it seems that the efforts in Zambia stand a higher chance of success.

The paper also sheds light upon some broader theoretical issues related to degrees of ‘drivenness’ and forms of governance (and their consequences) in global commodity chains. In contrast to the global cocoa and coffee chains, there is no clear tendency towards increasing buyer-drivenness in the global cotton chain. The division of labour between the main agents in the global cotton chain (producers/ginning companies, traders and spinners) has remained largely unchanged for decades. International trading companies still perform their traditional role as bridges between producers/ginning companies and spinners. Apparently most trading companies have been reluctant to supply new types of ‘services’ to spinners, although spinners are increasingly impose new demands for detailed calibration of lint fibre properties upstream in the chain. To a large extent though, relationships between the different agents in the chain still consist of ‘arm’s length’ transactions, based on short-term contracts between particular suppliers and consumers. Thus, the global cotton chain embodies market form of governance, where quality-related prices are the main coordinating mechanism in the chain. As quality is the main source of differentiation (and barriers to entry) in end-markets, preservation of quality upstream in the chain to farm level is a prerequisite for the longer-term development of cotton sectors in Sub-Saharan Africa.

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Appendix

Table 1: Cotton trading organisations in 2000*, arranged by size (estimates made by ICAC) (total volume, 8 million tons)

Company name	Country of registration	Type
Dunavant, incl. Australia	USA	Private
Allenberg & Dreyfus, owned by Dreyfus	France	Private
Hohenberg & Ralli, owned by Cargill	USA	Private
Uzagroimpex	Uzebekistan	Government
Plains Cotton Cooperative Association	USA	Cooperative
Staple Cotton Cooperative Association	USA	Cooperative
Calcot Ltd.	USA	Cooperative
Reinhart, incl. US	Switzerland	Private
Queensland Cotton Corporation Limited	Australia	Private
COPACO	France	Private
Weil Brothers-Cotton, Inc.	USA	Private
L'Aiglon Ltd.	Switzerland	Private
Ecom USA	USA	Private
Colly Cotton	Australia	Private
Plexus Cotton	UK	Private
The Cotton Marketing Organization	Syria	Government
Toyo Cotton Co	Japan	Private
Chinatex	China	Government
The Cotton Corporation of India Ltd.	India	Government
Toyoshima & Co. Ltd	Japan	Private
Namoi Cotton Cooperative Ltd.	Australia	Cooperative
Société d'importation et de Commission	France	Private
Baumann Hinde	UK	Private
Meredith Jones	UK	Private
Volcot America	USA	Private

* Organisations engaged in international trade and handling at least 100,000 tons lint per year, including both international and domestic sales. Estimates of size are approximate and actual rankings may vary from the order shown.

Source: ICAC, 2002.

Box 1: Cotton fibre classification – main fibre properties

Cotton fibre classification is based on the properties of lint according to four main properties: grade, length, strength, and micronaire.

Grades defined by the US Department of Agriculture are generally accepted as the world standard.
Cotton is usually graded on the basis of three features: trash content, colour and gin preparation. *Trash content* describes the quantity of foreign matter in the lint, which may be either organic or inorganic in composition. The quantity depends critically on the harvesting method (e.g. machine or hand-picked), initial trash content (neps (seed-coat fragments), dead/immature fibres) and the number of mechanical cleaners before ginning. The *colour* of lint is measured by the degree of reflectance and yellowness. Reflectance indicates how bright or dull a sample is, and yellowness indicates the degree of colour pigment. There are 25 colour grades and five categories of 'below grade colour'; one of them is yellow stained lint, caused by attacks of cotton stainer (USDA, 2002). *Gin preparation*: Generally, there are two different ginning technologies, roller ginning and saw ginning. Roller gins are superior in terms of maintaining the fibre length during the ginning process (gentler on cotton fibres) compared with saw gins. Roller gin is suitable to gin longer staple cotton, and roller ginned lint is (generally speaking) rewarded by a premium.

There are four categories based on **length**: short, medium, long, and extra long staple, ranging from less than 26 mm for short staple cotton and 39 mm or more for extra long staple. The length of the fibres will vary in a given bale, but the bale is categorised according to the dominant fibre length. Fibre length is considered the premier fibre quality because staple length is closely correlated with processing efficiency and the quality of the yarn produced (Bradow et al, 1997). Fibre length is basically an inherited/genetically character of the seed variety, but also related to the ginning process (see above).

The **strength** of cotton fibres is measured by grams per square cm or inch. The inherent breaking strength of individual cotton fibres is considered to be the most important factor in determining the strength of the yarn spun from those fibres. Fibre strength is primarily determined by 'genotype'(seed variety), but also to some extent influenced by climatic conditions.

Micronaire is a measure to determine fibre maturity and to ascertain how the fibre is filled out. This is done by measuring the air permeability of a specified sample of cotton fibres. Low values indifine and /or mature fibres (Bradow and Davidonis, 2000).

Table 2: Pima ratio to the A Index

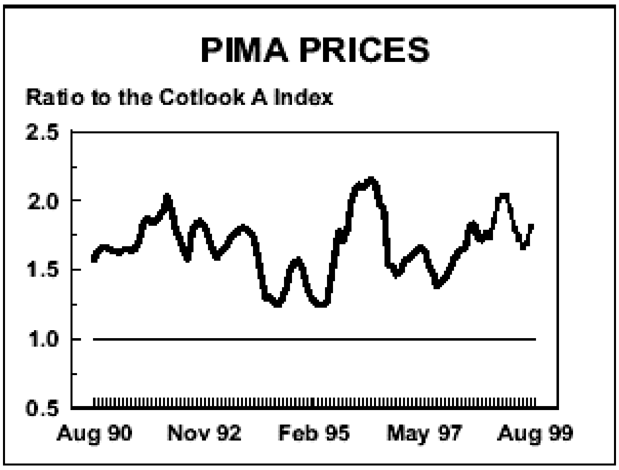

Table 3: US SJV ratio to the A Index

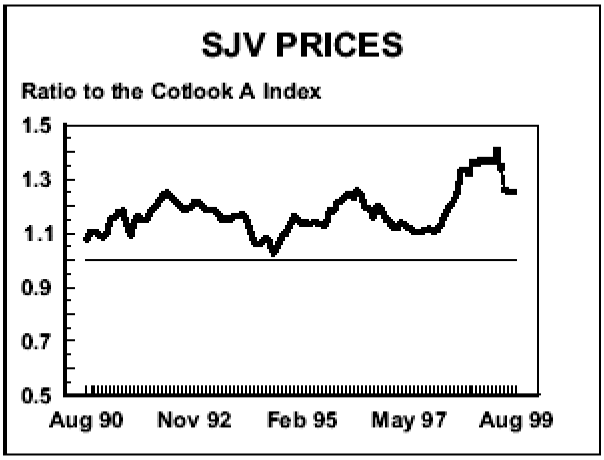

Table 4: High-medium ratio to the A Index

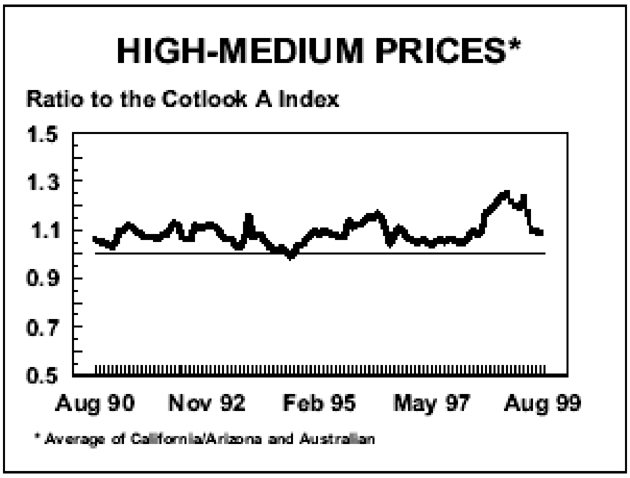

Table 5: Uzbek ratio to the A Index

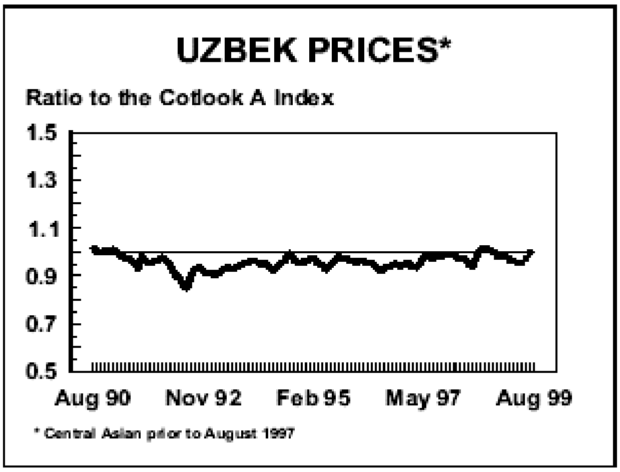

Table 6: Franc. Zone ratio to the A Index