

SPECIAL FOCUS

The Impact of Lower Cotton Fiber Prices on Polyester Fiber Demand

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Cotton has been losing market share to synthetic fibers for decades. But the price of cotton has recently reached historically low benchmark levels - a condition expected to persist. CMAI's forecast strength in fiber intermediates leads to the potential for cotton/synthetic substitution. But to what extent will this take place?

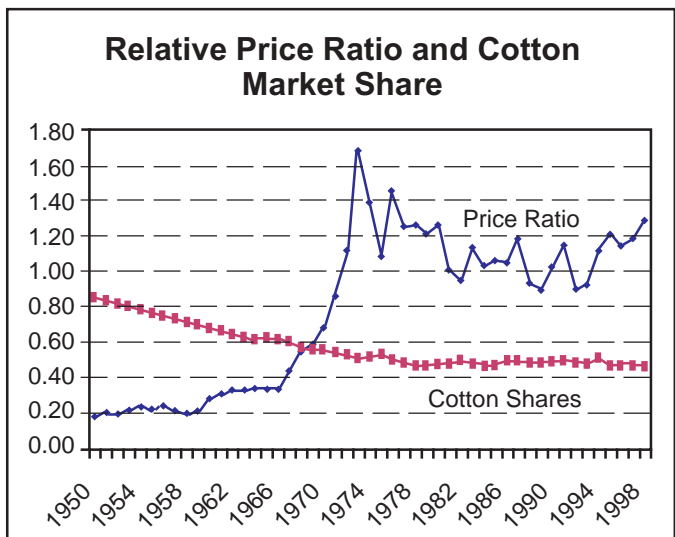
Recently, cotton prices have been at historically low levels and show no signs of rebounding, with the authorities in both the US and China supporting cotton production. The conventional wisdom is that as cotton prices fall relative to polyester, cotton gains market share.

Indeed from 1950 to the mid 1970s cotton's share certainly declined as polyester's price fell sharply in response to improved production efficiencies for the new fiber. However, as the price trend reversed in the 1970s, 80s and 90s with cotton becoming increasingly more price competitive, cotton's decline has at best stabilized with no sign of a recovery in its share.

Cotton prices are difficult to forecast as they depend on acreage planted and weather patterns, current prices are quite low, which is expected to continue at least through this year. Moreover CMAI forecasts are for polyester raw material and fiber prices to increase in the near term. Will the near future at last see polyester's relentless volume surge reversed and impact this projected price rise? Detailed analysis, supported by new statistics on fiber usage calculated by David Rigby Associates (DRA) and coupled with CMAI's views on polyester intermediates, suggest that any price-driven return to cotton will be modest, at best, and have little impact on the expected pricing profile for polyester fiber.

— Textile End-uses for Cotton and Polyester Fiber —

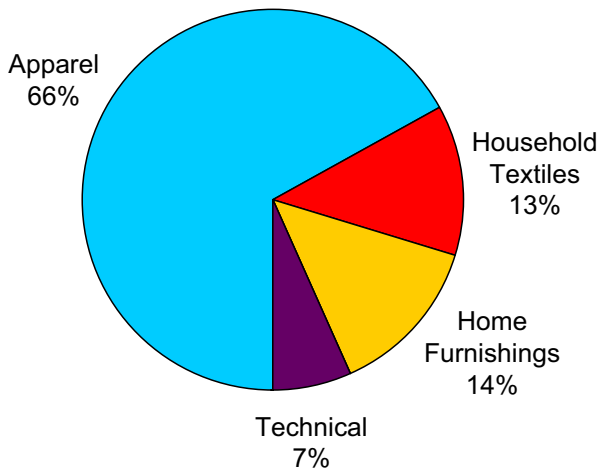
Polyester and cotton are by far the largest players in global textile markets with each accounting for over 30 percent of total fiber usage. However, the areas of



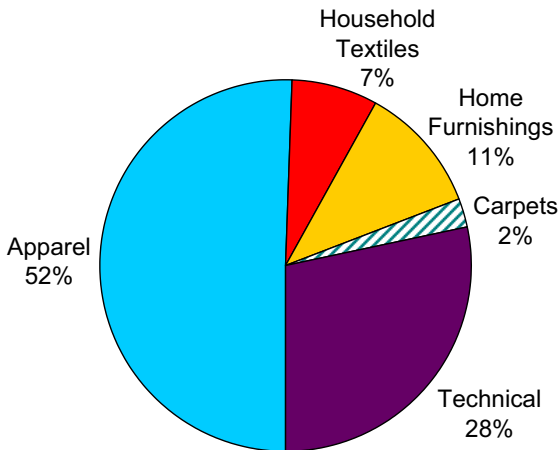
direct competition between the two fibers are surprisingly few. Firstly, cotton does not, in effect, compete with polyester in either its filament yarn form, which offers particular characteristics in terms of appearance, tenacity, etc, or as melt-laid nonwovens (which process is not open to cotton). This effectively eliminates well over half of polyester fiber from the direct threat of low cotton fiber prices.

In terms of the remaining staple fiber forms of both cotton and polyester, the following charts indicate that here, too, the fibers have very different end-use profiles, with technical applications accounting for 29 percent of polyester usage against only 6.5 percent for cotton, while home textiles and furnishings (including curtain linings and carpets) account for 27 percent of cotton but only 20 percent for polyester. Apparel applications also account for a much higher percentage of cotton (67 percent) than of polyester (51 percent), and, as explained below, the importance of individual fabric types within this category differ widely between the two fibers.

Cotton Staple by Main End-Use



Staple Polyester by Main End-Use



— Fiber Selection in Garment Markets —

While the relative price of a fiber has some affect on its usage, many other factors influence the fiber selection process.

— The Impact of Changes in Relative Fiber Prices on Overall Costs —

For virtually all garments, fiber represents only a small percentage of total cost; carding, spinning, weaving (or knitting), dyeing (or printing), finishing, fabric cutting and stitching are only some of the processes involved in the transformation from staple fiber to finished garment. It is true that in a cost-push supply chain (for example as still experienced in many segments of the

Japanese retail garment market) a 10 percent reduction in unit fiber costs can result in a similar percentage decrease in the final retail price. Hence a 10 cents cut in the cotton fiber content of a garment from 50 to 40 cents could in theory result in the price of a \$100 finished garment falling by \$20! However, textile processors face extreme price pressures in most product segments and are highly resourceful in “engineering” their products to meet target price points, while still meeting the required aesthetic, performance, tactile and other requirements for the finished product. It is therefore quite possible for an increased fiber price to be completely absorbed along the supply chain.

Moreover, polyester is an inherently easy fiber to process relative to cotton, certainly in terms of yarn spinning, fabric forming and preparation for dyeing or printing. As a result, any price advantage for cotton at the fiber level is often eroded at the finished fabric level.

— Fitness for Purpose —

Of more importance than relative fiber prices and processing costs in the fiber selection process is the need for the finished fabric to meet the aesthetic and performance requirements for its assigned end-use. These requirements include handle, drape, luster, performance in-use, easy-care, etc. While cotton has certain distinct characteristics such as a natural handle, dry, crisp touch, and breathability, which make it ideal for certain applications such as T-shirts, denim and woven shirting fabric, it has certain deficiencies in terms of easy care, drape, durability, processability, etc. Moreover, unlike polyester, whose success has been partly based on its versatility and consequent ability to replicate different looks, handles, etc, cotton is far more restricted in terms of its form and function. There are some efforts underway by various cotton associations to increase the demand for cotton via advertising and branding, which may help slow the decay. Any impact would likely be concentrated in the Western economies where cotton’s image is stronger and market penetration is greater. However, these same markets are also more mature, have lower population growth, and are therefore forecast to have a slower rate of growth in overall fiber consumption.

Looking more closely at the end-uses of cotton and polyester in apparel, it becomes apparent that the potential for cotton to take share from polyester in this

field is very limited. By dividing the global apparel fabric market into its component fabric types (or “stories”), it can be seen that there are few areas of overlap between polyester and cotton, with cotton heavily concentrated in seven key “classic” (i.e. non-fashion) areas which together account for some 76 percent of all cotton apparel usage. In comparison, polyester usage is split across numerous fabric stories, including a significant proportion in “fashion mixes”, reflecting its versatility and ability to reflect, either on its own or in blends with other fibers, many looks, including the fashion of the moment. Only in the areas of woven shirting, knitted “athleisurewear” (i.e. part sport, part leisurewear) topweight fabrics and woven casual bottomweights (e.g. chinos) do both cotton and polyester each have a significant presence. In these areas, significantly, polyester cotton blends are used. These are the areas of greatest potential for a switch in either direction between cotton and polyester in response to relative fiber price changes, since many processors are already dealing with both fibers and are able relatively easily to weaken or strengthen the cotton mix, for example from a 65/35 polyester/cotton blend to a cotton-rich 60/40 blend without major changes in the fabric’s overall characteristics. In other garment fabric stories where polyester has a presence, such as woolen/worsted-look fabrics and semi-formal bottomweights the fabric requirements are unlikely to be met by cotton; its use in these segments therefore will be extremely limited regardless of how low the fiber price falls.

— Household Textiles and Home Furnishing Markets —

Similar fiber selection criteria apply to home furnishing and household textile markets, but with more emphasis on performance (especially easy-care). It is its ease of washing and ironing and crease-resistance that has enabled polyester, mostly in blends with cotton, to take a major share of the bed- and table-linen market. For the same reason its share is largely protected against lower priced cotton, although at the margin there could be a weakening of polyester in the mix as in the case of shirting fabric. In the case of solid curtains (drapes) and curtain linings, where performance requirements are less rigorous, polyester’s share is less well protected and it could be vulnerable to cotton purely on price grounds. The volumes involved in this instance, however, are relatively small.

— Technical Textile Markets —

In the field of technical textiles fiber price usually plays an even less important role in determining fiber shares, since in most cases product performance is critical and often fiber-dependent. In this field, polyester and cotton rarely compete head-on. Where they do, polyester’s position is generally secured by its physical characteristics, for example its tenacity (for use in sewing thread) or its abrasion resistance (furniture components). In the largest single technical end-use for staple polyester, fiberfill, cotton retains only a niche position – for example in Japanese futons - and cannot compete in performance terms with the lightness and easy-care characteristics of polyester.

Similarly in shoe linings and other components where large volumes of polyester are used in either nonwoven or knitted form, cotton cannot meet the abrasion requirements for most specific end-uses. Moreover, footwear is a good example of an industry which has established supply chains based on the long term development of certain fibers (polyester) and fabrics (nonwovens) which is unlikely to suddenly make a fundamental change in its manufacturing practice for what might be only a temporary price advantage offered by cotton.

— Conclusions —

In summary, the relative insignificance of fiber prices on overall textile costs, the low processing costs of polyester, the unsuitability of cotton to meet the needs of many end-uses where polyester is strong, and supply chain rigidities all mitigate against a significant loss of polyester fiber in the face of any likely cotton price reduction. This is represented by a low price elasticity of demand for polyester relative to cotton – which we estimate to be around -0.3 - indicating that a 10 percent decrease in the relative price of cotton goods would lead to only a 3 percent switch from polyester. Assuming that a 20 percent price reduction in cotton fiber price would generate a 10 percent reduction in finished fabric price relative to polyester, we calculate, using latest figures derived from DRA’s model on world fiber usage by market segment, that this would result in less than 250,000 tons of polyester switching to cotton (see table).

CMAI’s worst case envisages a relative price difference increasing by double this amount. The implied 500,000

ton temporary shift of market share is equivalent to about 25 percent of one year's "normal" global growth for polyester, but would still not be enough of a demand shift to impact the forecast tightness in polyester feedstocks (and therefore fiber), though it could delay the advance slightly.

This dynamic model of the impact of polyester's and cotton's market shares on the outlook for polyester pricing, which involves an iterative assessment of both demand and supply issues, provides another demonstration of the unique strength of the synergistic alliance between CMAI and DRA.

TABLE: SENSITIVITY OF POLYESTER FIBER VOLUME TO CHANGES IN RELATIVE FIBER PRICE

Segment	Cotton Staple Usage (Tons)	Polyester Staple (Tons)	Cotton Substitutability for Polyester	Estimated Polyester Price Elasticity	Potential Polyester Loss Assuming 20% Cotton Fiber Price Decrease ('000 Tons)
Garments					
casual trousering	2.4	0.6	medium	-0.5	-30.0
denim	1.9	0.0	very low	0.0	0.0
shirting	1.7	0.3	medium/high	-1.0	-30.0
T-shirts	1.2	0.0	very low	0.0	0.0
cotton type underwear	1.1	0.1	low	-0.1	-1.0
socks	0.9	0.0	very low	0.0	0.0
knitted staple athleisurewear	0.8	0.3	medium/high	-1.0	-30.0
semi-formal bottomweights	0.0	0.9	very low	0.0	0.0
fashion mixes	0.1	1.1	low	-0.1	-11.0
wool type	0.0	0.3	very low	0.0	0.0
other garments	3.1	0.5	low/medium	-0.3	-15.0
Total Garments	13.2	4.1		-0.3	-107.0
Household/Home Textiles					
bed, table linen	1.3	0.5	medium/high	-1.0	-50.0
other household textiles	1.2	0.1	low	-0.1	-1.0
drapes	1.4	0.2	high	-1.5	-30.0
other home furnishings	0.6	0.5	low	-0.1	-5.0
curtain linings	0.7	0.2	high	-1.5	-30.0
Total Household/Home Textiles	5.2	1.5		-0.8	-116.0
Technical Textiles					
shoe components	0.0	0.4	low	-0.1	-4.0
fibrefill	0.1	0.9	low	-0.1	-9.0
other technical textiles	1.2	1.0	low	-0.1	-10.0
Total Technical Textiles	1.3	2.3		-0.1	-23.0
Carpets	0.0	0.1	very low	0.0	0.0
TOTAL	19.7	8.0		-0.3	-246