

# Major Factors Affecting World Cotton Price Behavior

## Prepared in Response to Brazil's WTO Challenge Of the U.S. Cotton Program<sup>1</sup>

### Executive Summary

In November 2002 the Brazilian government requested consultations with the United States concerning virtually all aspects of the United States cotton program, then in February 2003 requested the establishment of a Panel to hear the dispute. Among Brazil's claims was that the U.S. cotton program had depressed world cotton prices causing serious prejudice to Brazilian growers, especially during the years 1999-2002. The following analysis demonstrates that there were a number of influences, completely unrelated to the U.S. cotton program that served to depress world cotton prices during the 1999-2002 period.

Brazil's submission would have one believe that the world cotton situation began in 1998 and nothing influenced world cotton markets prior to that time, or that other countries even produce and export cotton. In fact, some context prior to 1998 is essential to understanding the unusual events that did occur between 1999 and 2002. Furthermore, 1998 was an unusual year for U.S. production, making it an inappropriate basis for comparison, as Brazil does whenever it is convenient.

World cotton prices fell steadily during the 7-year period from 1994/95, when the A-index reached a record of 91 cents, until 2001/02, when it averaged 42 cents, the lowest in 30 years. A number of economic and policy changes account for the persistence in recent years of unusually low cotton prices.

- The production of competing synthetic fibers, stimulated by subsidies for locating and operating plants, exploded during the 1990's, putting downward pressure on world cotton prices. World production of polyester alone increased from 39.7 million cotton bale equivalents in 1990 to 93.7 million in 2002.
- The world economy has struggled since the Asian financial crises in 1998. Since 1998, foreign GDP growth has been less than 2 percent in 4 out of 6 years, which directly affects the demand for cotton.
- Aside from the U.S., world retail consumption of cotton has been flat for over a decade. The U.S. retail market consumed at least 22 million bales in 2003 of which 88 percent was imported products. Outside the U.S., consumers added over 40 million bales to textile fiber consumption since 1990, and virtually the entire amount was accounted for by polyester.

---

<sup>1</sup> Analysis was prepared in the fall of 2003 in response to Brazil's WTO challenge of the U.S. cotton program. Excerpts of this analysis were included in the *U.S. Further Submission, United States -- Subsidies on Upland Cotton (WT/DS267)*, September 30, 2003 (available online at <http://www.ustr.gov>).

- Policy decisions in China regarding stockholding and imports have significantly influenced world cotton prices:
  - Between 1994 and 1996, China increased cotton imports at the same time its stocks were also increasing to excessive levels.
  - Following the large stock accumulation, China subsidized the release of 14 million bales of government stocks between 1999 and 2002, equaling as much as 7 percent of world consumption in 2000/01.
  - Both the stock accumulation and subsidized release were non-market actions that first supported the world cotton price and then depressed it.
  
- Weakness in competing crop prices affected cropping patterns:
  - Prices of the primary competing crops have also been at depressed levels since the mid-1990s. As a result, acreage has been slow to shift out of cotton due to the lack of attractive alternatives.
  - All commodities priced in dollars have seen prices depressed by the soaring U.S. exchange rate.
  
- Subsidized cotton yarn production:
  - Some cotton-producing countries subsidize the production of cotton yarn. These artificially low yarn prices keep downward pressure on raw cotton prices.
  - A combination of tax rebates, duty waivers and other fiscal measures in conjunction with export licensing on raw cotton have sometimes resulted in yarn prices equal to or lower than raw cotton prices.
  
- Unusually good weather in a number of key cotton-producing countries in 2001/02 boosted production just as the economic slowdown trimmed demand.
  
- Lack of adjustment in insulated domestic markets:
  - A number of countries important to the world cotton economy have partly insulated themselves from world prices, forcing the adjustment on the rest of the world to be larger than necessary.
  - West Africa's unprecedented devaluation, Central Asia's central economic planning, and China's import prohibitions cut these countries off from world price declines, driving prices down further.
  
- Improvements in production efficiency for cotton have lowered costs for major producers and pressured cotton prices.

Clearly, the recent fall in world cotton prices has occurred for many reasons unrelated to U.S. commodity policy. U.S. domestic programs did not cause this unprecedented decline. The U.S. cotton program expenditures are a response to — not a cause of — depressed world prices. World cotton prices did not fall because of the increase in U.S. cotton exports. The increase in U.S. exports reflects the shifting conditions in world textile and apparel production. Burgeoning U.S. textile imports, reflecting the strong U.S. dollar and declining U.S. competitiveness in textile and apparel production, have fundamentally shifted the use of U.S. cotton production from domestic mills to export markets.

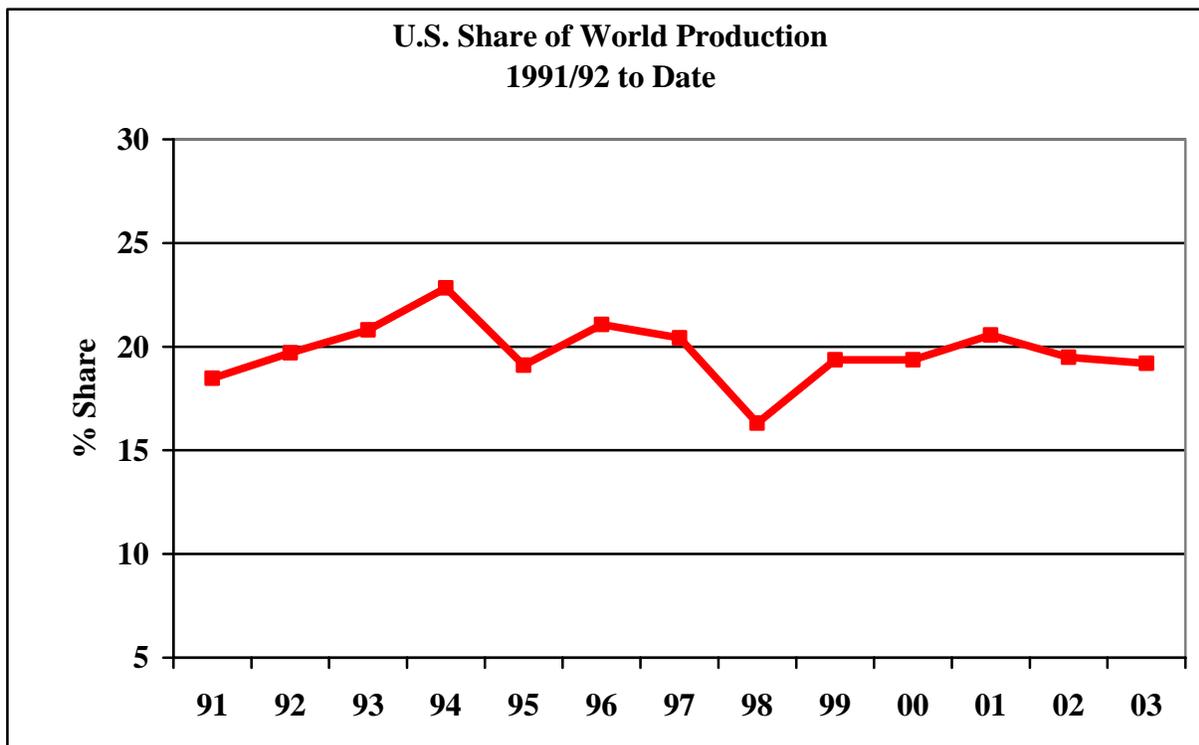
## Cotton Market Analysis

### Understanding Factors Driving World Cotton Markets Is Crucial For Explaining What Affected World Cotton Prices and U.S. Production and Exports between 1995-2002

The following chronological narrative tracks developments in world cotton markets since 1994 to provide the context completely missing from Brazil's submission. After the narrative, additional analysis is provided on some of the key developments to further explain what really affected and drove world cotton prices during this unusual period.

#### 1994/95 through 1996/97

World cotton prices rose to record highs in the 1994/95 season—the A-index exceeded \$1.20 per pound in May 1995 and remained above 80 cents through July 1997. World cotton consumption was recovering from the stagnation that resulted from the break-up of the Soviet Union in the early 1990's, reaching 87.6 million bales in 1996/97. China's imports averaged about 3.5 million bales per year for the 1994/95 through 1996/97 seasons, triple the level of the early 1990's. The U.S. and producing countries outside of China added about 2.5 million bales, respectively, to their average production of the early 1990's. U.S. upland cotton production averaged approximately 18.5 million bales during this period, which coincided with the lifting of supply restrictions and de-coupling of program payments under the Federal Agriculture Improvement and Reform Act of 1996. Despite the significant program changes of the mid-1990s, the U.S. has maintained a relatively constant share of world production since 1991/92.



### 1997/98

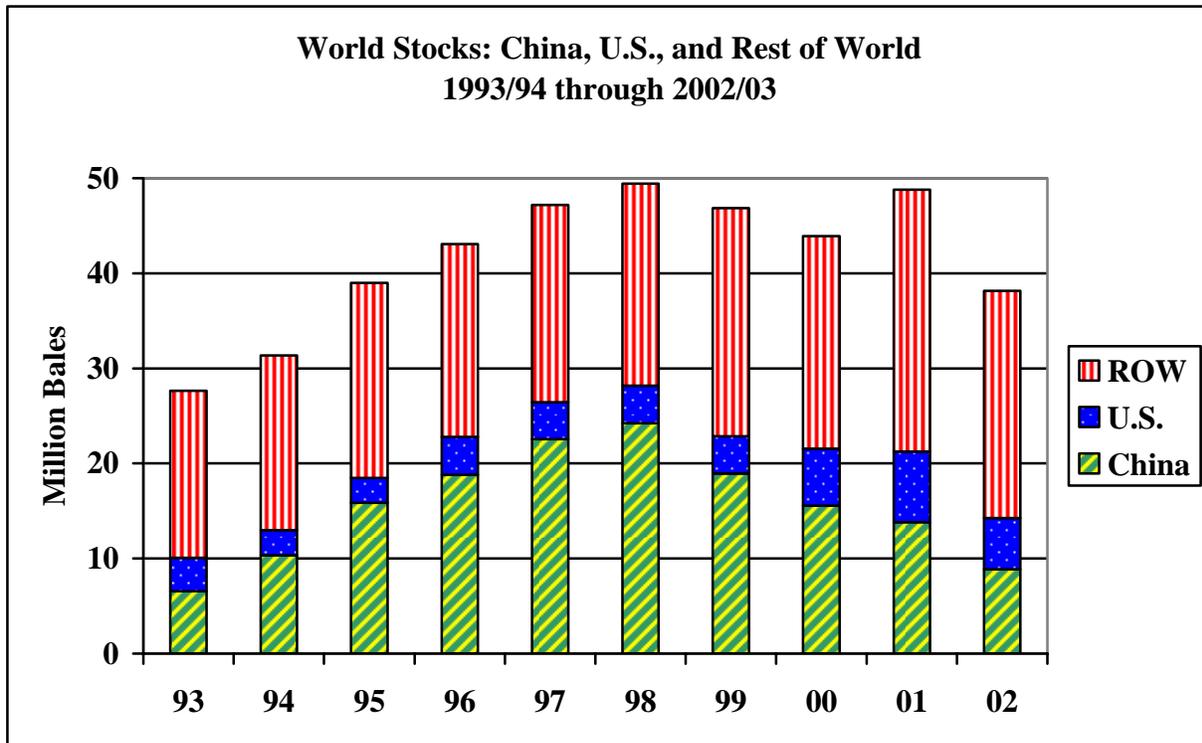
U.S. cotton production was stable in 1997/98, while increases in China and other foreign countries, including Brazil, boosted world production 2.3 percent. World consumption fell slightly. World stocks became increasingly excessive, due almost entirely to the continued accumulation of stocks in China, which held 47 percent of the world's stocks at the end of the 1997/98 season. China also cut its import level in half from the preceding year. Lower world consumption, combined with rising stocks, reduced world prices for the third consecutive season, and the A-index averaged 72 cents.

U.S. stocks were nearly unchanged from 1996/97 and exports were slightly below the preceding 3-year average. The 1997/98 season saw the all-time record for U.S. domestic mill use, which reached 11.2 million bales for upland cotton.

### 1998/99

The 1998/99 season was unusual in several respects. World production fell nearly 7 million bales—severe drought in the U.S. reduced production nearly 5 million bales, accounting for 70 percent of the world's decline. In fact, U.S. cotton supplies were so tight that the U.S. imported 427,000 bales in MY 1998, the largest in 70 years. World consumption also fell as a result of the effect of the Asian financial crisis, which had drastic impacts on the major cotton importers of South Korea, Indonesia, and Thailand. World GDP growth was reduced by 1.3 percentage points, from above 4 percent to below 3 percent, according to the IMF. The decline in world cotton production did not offset the combined effects of higher beginning stocks and lower consumption, and ending stocks rose again -- to 48.1 million bales, which to date are the largest on record. China held 23 million bales, about half of the world total. U.S. upland cotton exports fell to 4.0 million bales, a 45-percent reduction from the preceding 5-year average while U.S. ending stocks remained about the same as the preceding year. The A-index fell for the fourth consecutive season to 59 cents per pound, a six-year low.

Given the severe drought in the U.S. and the effects of the Asian financial crisis on world consumption, Brazil's use of the 1998/99 season as a base year for subsequent comparisons is seriously misleading.



#### 1999/2000 and 2000/01

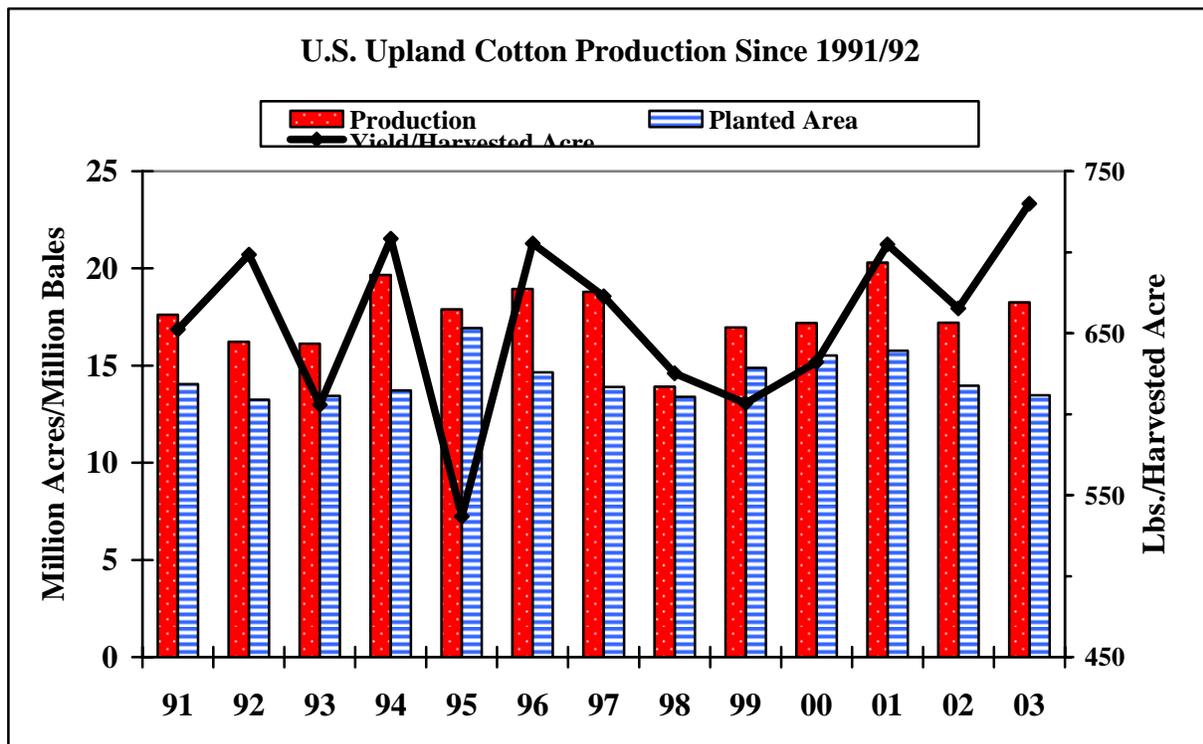
In the fall of 1999, China began a four-year program to reduce its domestic prices to bring them closer to world market-clearing levels, while disposing of the surplus stocks accumulated during the preceding four years. By restricting imports to negligible levels and bringing government-held stocks to auction, China reduced its large surplus by about half between 1999 and 2002. China's program kept world prices under pressure, and the A-index fell again in 1999/00 to about 53 cents, despite a rebound in world consumption and a 5-percent reduction in world ending stocks. U.S. 1999 cotton production recovered from the 1998 drought, but was still 7 percent below the average of the 5 years preceding 1998. U.S. upland cotton exports of 6.3 million bales were also 7 percent below the 1993/94-1997/98 average. U.S. ending stocks of upland cotton were virtually constant for the fourth consecutive year at 3.7 million bales.

In 2000/01, both U.S. and world production were relatively stable. (Brazil's cotton production increased 34 percent from the preceding year, more than doubling its mid-1990s level.) World stocks fell, but China accounted for more than the total world decrease. U.S. stocks rose 60 percent, due mainly to a significant decline in domestic mill use. The U.S. apparel industry eroded throughout the 1990's due to difficulties competing with developing countries' lower labor costs. The loss of the apparel industry was exacerbated by the Asian financial crisis of 1998, which enhanced the competitive position of several major Asian apparel producers by devaluing their currencies and making them prime candidates for investment in more capital-intensive spinning equipment. With the loss of its apparel customer base, the U.S. spinning industry entered a period of rapid decline.

2001/02

The extremely low world prices of 2001/02 resulted from the same pressures that reduced prices in five of the six years after 1994/95, especially the continued disposal of surplus stocks by China. What distinguished the 2001/02 season in addition to these factors was: (1) very good weather in nearly all of the world's major cotton-producing countries, resulting in a record world yield; combined with (2) the effects of recession, especially the crisis in U.S. consumer confidence which followed the terrorist attacks of September 11, 2001.

World cotton area rose 5 percent in 2001/02, but production rose 11 percent, as nearly all of the world's major cotton-producing regions experienced good-to-excellent weather. The 2001 growing season marked the first time in 17 years that yields rose simultaneously in the U.S., China, Central Asia, India, the African Franc Zone, and Australia, which collectively account for more than 70 percent of world production. This was a highly unusual circumstance, since typically problems in one region offset favorable conditions somewhere else. U.S. upland cotton area was virtually the same as in 2000/01, but production rose 17 percent as a result of near-record yields. The U.S. is more susceptible to yield fluctuations than many other cotton-producing countries because a high proportion of its cotton relies on rainfall rather than irrigation. The history of U.S. cotton production since 1991 shows greater stability in planted area than production, due to the volatility of yields.



While the U.S. economy showed signs of weakening in early to mid-2001, the terrorist attacks of September 2001 pushed the U.S. into a full-blown recession, and precipitated a crisis of confidence in world textile demand. At the retail level, U.S. consumers annually consume over

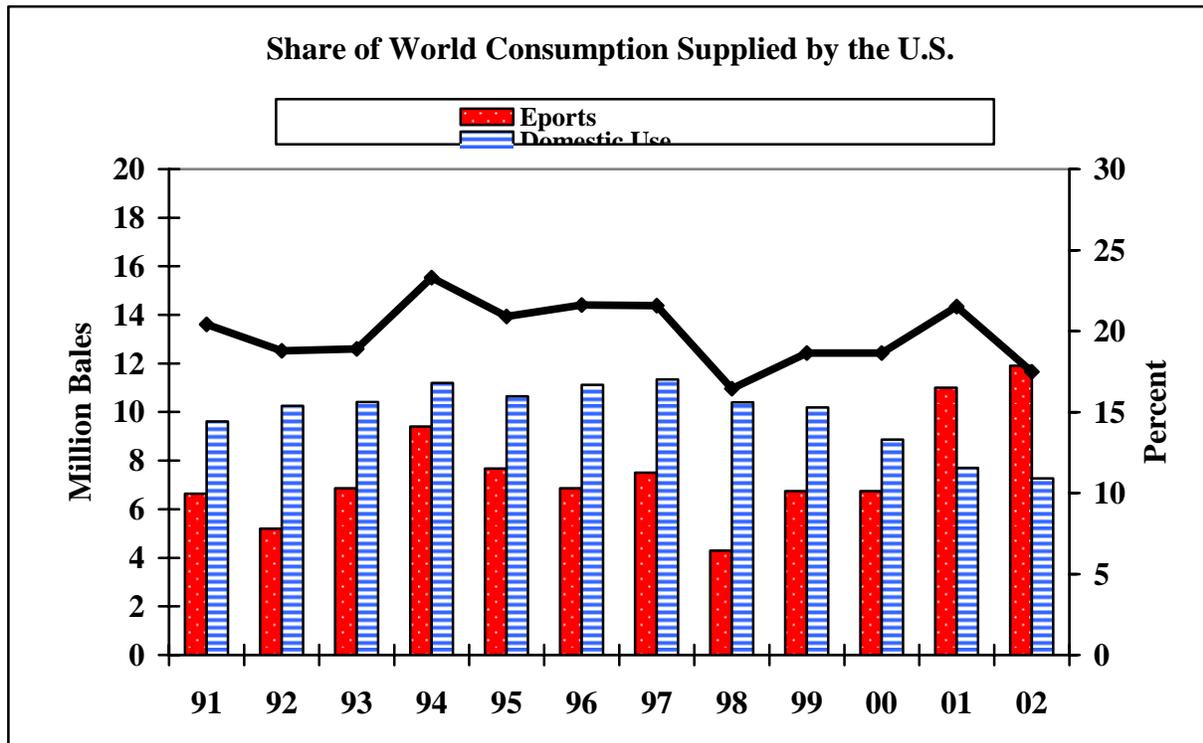
20 percent of the world's cotton and, in the aftermath of the attacks, there was serious doubt about how much the U.S. would consume and to what extent the crisis would extend to other countries. The A-index reached a 30-year low of just under 35 cents per pound in early November 2001, the point at which qualms about consumption prospects coincided with evidence that large crops would be produced in most northern hemisphere countries. As it turned out, the U.S. recession was milder than many expected and world consumption rebounded, allowing the A-index to recover to 45 cents per pound by the end of the season.

It is important to note that the cataclysmic drop in prices in the fall of 2001 occurred just prior to the planting of cotton crops in the Southern Hemisphere. Thus, all of the major southern hemisphere cotton-producers—Argentina, Australia, Brazil, Paraguay, and Zimbabwe—made sharp reductions in area in response to market information that was not available to their northern hemisphere counterparts six months earlier.

While world cotton consumption recovered quickly from the 2001 crisis, the same cannot be said of U.S. domestic mill use. The unanticipated weakness in U.S. consumer spending in the fall of 2001 exacerbated longer-term issues of exchange rate pressures, the loss of the apparel customer base, and the ongoing liberalization of textile import quotas, forcing many mills to close and/or declare bankruptcy. Approximately 75,000 jobs were lost in the U.S. textile industry in 2000 and 2001. Foreign mills were the main beneficiaries, as U.S. net cotton textile imports nearly doubled in five years, reaching almost 12 million bale equivalents in 2001/02, up from 6.2 million in 1996/97.



With foreign consumption capturing an ever-increasing share of world consumption, U.S. cotton, which formerly was mostly used by domestic mills, began to find markets overseas. U.S. exports of all cotton rose sharply in 2001/02 to 11.0 million bales, about 38 percent of world trade, a share it maintained in 2002/03 and is expected to reach again in 2003/04. Higher exports simply offset the loss of domestic mill use, leaving the share of world consumption supplied by U.S. cotton roughly the same since 1991/92.



Despite larger exports, U.S. upland cotton stocks at the end of 2001/02 rose to 7.1 million bales, about 70 percent above the preceding 5-year average, owing to the surplus of cotton in the world and China's continued stocks-reduction program. World stocks rose 4.5 million bales from the preceding year, and the U.S. accounted for about 30 percent of the increase. Foreign stocks outside of China also rose to burdensome levels.

2002/03 and 2003/04

World production fell sharply in 2002/03, as planted area responded to lower prices, and weather conditions returned to normal. World production declined by 11 percent, or about 10.5 million bales, with the U.S. accounting for about 30 percent of the reduction. World consumption rose an unusually large 3.5 percent, as economic conditions improved, and textile production increased to restock inventories that were depleted in 2001/02. With stocks in China threatening to fall below the level needed to sustain its rapidly growing textile production, Chinese net imports surged to 2.4 million bales, the highest level in 6 years, signaling an end to the surplus disposal program. Ending stocks in the U.S., China, and the rest of the world returned to normal or near-normal levels, and the A-index rose 35 percent to an average of 56 cents per pound.

While still early in the 2003/04 season, USDA's September forecast put world stocks at their lowest level since 1994/95, raising the specter of a world cotton shortage for the first time in nearly a decade. World production is currently forecast to rise 6 percent, with all of the increase expected to occur in countries outside the U.S., including about half in China. However, the increase in production will not be adequate to compensate for lower beginning stocks, and world supplies will fall. World consumption is expected to increase but at a slower growth rate, as higher cotton prices may begin to ration demand. U.S. domestic mill use is expected to fall another 10 percent, but all-cotton exports are forecast at 12 million bales, maintaining the approximate share of world trade of the past two seasons. Ending stocks of upland cotton are indicated at a relatively tight 3.7 million bales, which would be the lowest level in five years.

### **Further Analysis Of Key Factors Affecting World Cotton Markets Demonstrates Brazil Has Seriously Overestimated The Impact Of U.S. Cotton Programs On World Prices**

The following information and analysis further demonstrates how the major economic and policy factors affected world cotton prices during the unusual situation prevailing between 1999 and 2002.

### **Competition With Synthetic Fibers Has Pressured World Cotton Prices**

Cotton is an input in the textile manufacturing process. The primary competitor to cotton is polyester, both in staple fiber and filament forms. Other fibers such as acrylics, nylon, rayon, wool, mohair, and silk are less substitutable for cotton in many textile applications and their total share of the world fiber market remains less than 25%. Asian production of textile polyester grew tremendously throughout the decade of the 1990's stimulated by subsidies for locating and operating polyester plants. Such subsidies include guaranteed energy delivery at low prices and waivers of corporate, export and value-added taxes. Asia (Korea to the Indian sub-continent) added more polyester production capacity between 1991 and 2001 than existed in the entire world in 1990. The largest polyester producing countries are Korea, Taiwan, India, China and Indonesia. China manufactured 5 million 480-lb. bale equivalents of polyester in 1990 and today manufacturers over 37 million bale equivalents. China alone accounted for two-thirds of the increase in textile polyester production between 1991 and 2001. This increase is of unprecedented proportions. World production of textile polyester was 39.7 million bales in 1990 and China accounted for just over 12% of production. By 2002, China alone was producing 37 million bales and held 39.5% of the world's production.

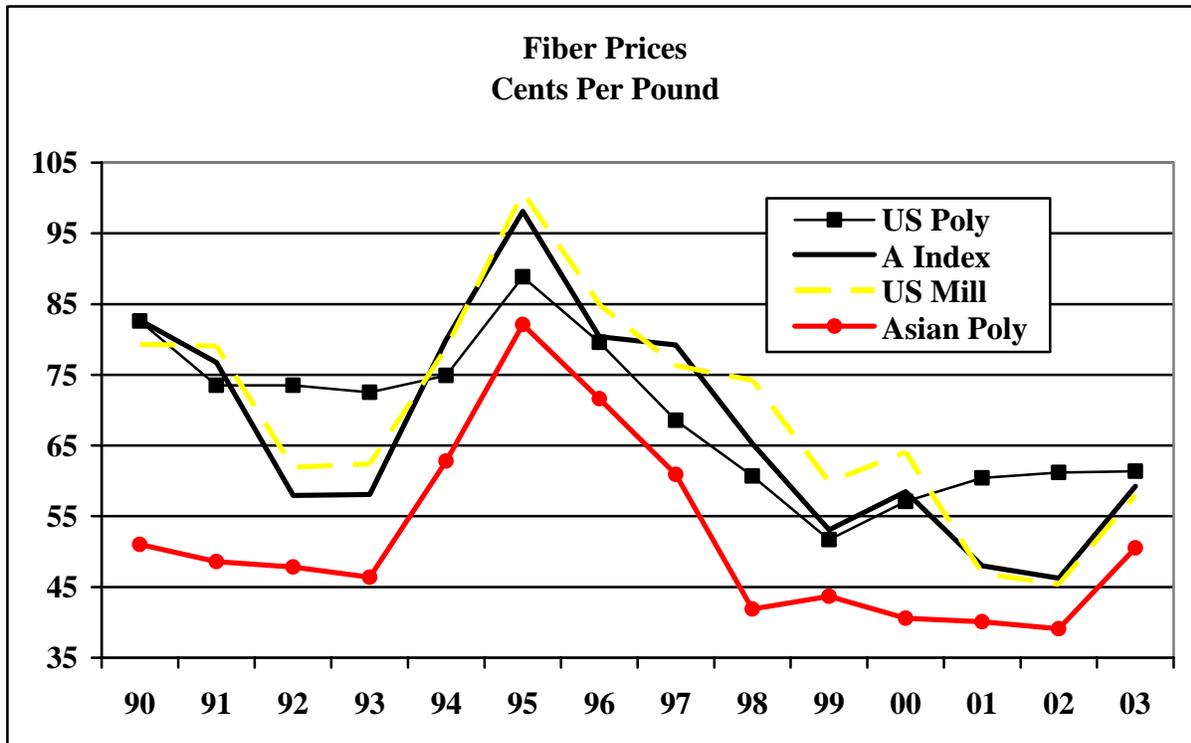
| <b>World Fiber Production</b> |                  |                     |
|-------------------------------|------------------|---------------------|
| <b>Million 480-lb. Bales</b>  |                  |                     |
|                               | <b>Cotton 1/</b> | <b>Polyester 2/</b> |
| <b>1990</b>                   | 87.2             | 39.7                |
| <b>1991</b>                   | 95.4             | 42.3                |
| <b>1992</b>                   | 82.3             | 46.1                |
| <b>1993</b>                   | 77.5             | 48.2                |
| <b>1994</b>                   | 85.9             | 53.2                |
| <b>1995</b>                   | 93.4             | 56.2                |
| <b>1996</b>                   | 89.9             | 60.5                |
| <b>1997</b>                   | 92.0             | 70.8                |
| <b>1998</b>                   | 85.3             | 75.5                |
| <b>1999</b>                   | 87.5             | 82.0                |
| <b>2000</b>                   | 88.7             | 87.9                |
| <b>2001</b>                   | 98.5             | 89.0                |
| <b>2002</b>                   | 87.9             | 93.7                |

1. Source: USDA  
2. Source: PCI

Polyester is formed from petrochemicals. Despite the volatility of petroleum prices since 1990, textile polyester remained at or below raw cotton prices since 1990. For calendar years 1995, 1997, 1998, 1999 and 2000 the per-pound value of polyester was below US and world prices for raw cotton. Asian polyester prices remained below world cotton prices from 1990 to 2001. The incredible increase in polyester production has contributed to weakened prices for the fiber across all markets. By 2002, cotton lost the position as the world's dominant fiber and slipped below polyester's market share.

The attached chart shows the average annual Asian and US mill delivered polyester as reported by Cotton Outlook Ltd, and the National Cotton Council, respectively. USDA reports cotton prices for US average spot price for 4134 cotton, US mill delivered cotton prices and the "A" Index. In general, Asian mill delivered polyester prices, as reported by Cotton Outlook, Ltd, run about 7 to 10 cents per pound below U.S. mill delivered polyester prices.

Given that the vast majority of the world's yarn spinning and textile manufacturing is located in Asia, the fiber price differentials are extremely important in determining fiber use.

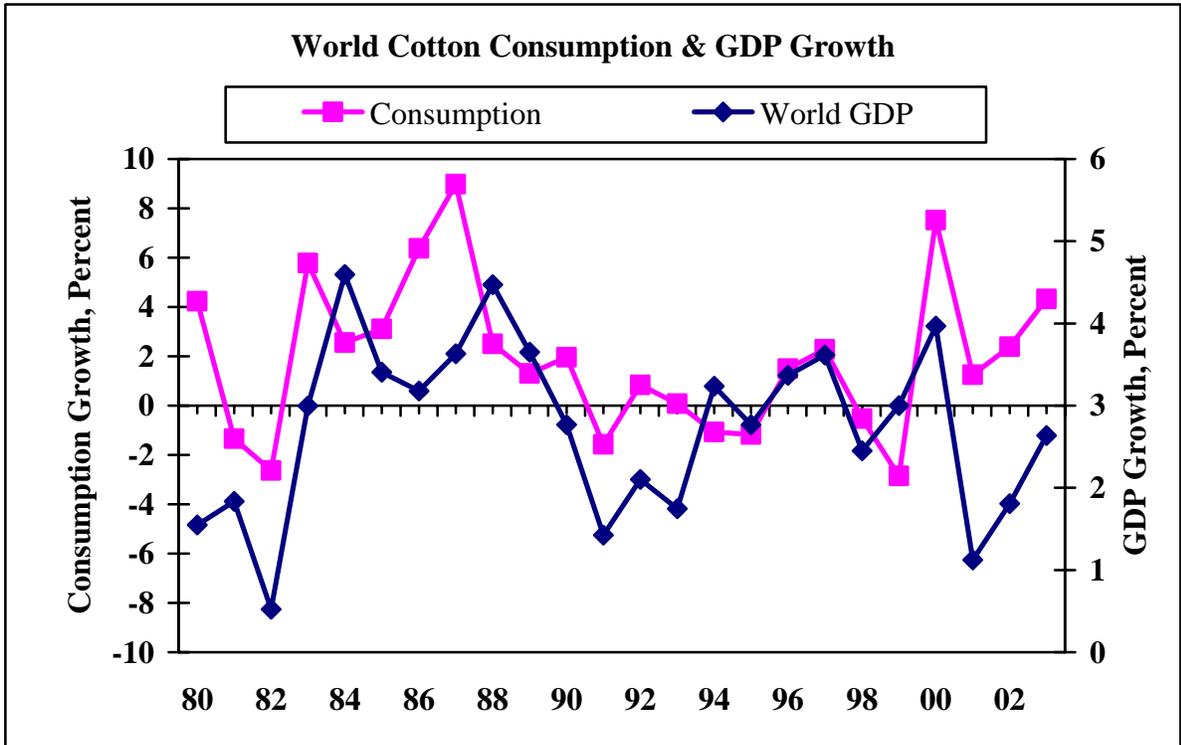


The decline in fiber prices from the highs experienced in 1995 and 1996 are quite expected as prices were far above historic averages. However, exchange rate movements that began in late 1998 and early 1999 contributed to further price weakness for most internationally traded commodities. When combined with the world economic slowdown, and surprisingly large world cotton crop in 2001 due to ideal weather in most of the northern hemisphere (which accounts for an average of 88% of world production), cotton prices fell to modern lows in 2001 and 2002.

### **The World Economy Grew Slowly During 2001 and 2002, Which Affected Overall Cotton Consumption**

Changing world incomes affect world cotton consumption more than consumption of other farm products. Other farm products are largely food and consumers have less discretion to adjust food consumption than they do non-food purchases. Clothing is a semi-durable good. When income growth slows, consumers cut back on current purchases and postpone clothing replacement until incomes rise. Between 1980 and 2001, the correlation between changes in world income and world consumption of rice, corn, soybeans, and wheat ranged from -3 percent (rice) to 17 percent (wheat). For cotton the correlation was 48 percent, meaning the consumption of cotton is more closely tied to world GDP movements than consumption of other commodities.

In 2001 world growth slipped to 1.1 percent, and by 2002 it had only recovered to 1.8 percent. This decline in world income occurred just as world cotton was increasing because of good weather, severely pressuring world prices.



**Outside of the U.S., Retail Consumption of Cotton Has Been Flat**

The U.S. is the world’s largest market for cotton. Over 22 percent of all cotton produced in the world is sold in the U.S. retail market. However, those retail sales are sourced from ever-larger imports of cotton products. Imported textile and apparel cotton products claimed 84 percent of the U.S. retail market in 2002. National Cotton Council analysts estimate that the U.S. retail market grew to at least 22 million bales in 2003 and 88 percent of the market is estimated to be imported products.

Consumer purchases outside the U.S. added over 40 million bales to textile fiber consumption since 1990, and virtually the entire amount was claimed by polyester. Consumers outside the U.S. buy no more cotton today than they did in 1990. The increased use of polyester is almost entirely a non-U.S. market phenomenon, and it has had a devastating impact on the world cotton demand and prices. Consumers outside the U.S. actually reduced their annual cotton purchases after 1990 and only regained their consumption level of 1990 by the year 2002.

The U.S. has been the only source of growth in retail purchases of cotton since 1990. World cotton consumption was supported entirely by expansion of the U.S. retail market for cotton textiles and apparel for the past 13 years. U.S. consumers added 8.6 million bales to their annual purchases of cotton products between 1990 and 2002. If U.S. consumers were not adding to cotton consumption, world cotton prices would be materially lower than they are today.

The growth in the U.S retail market has been assisted by the U.S. cotton industry itself. The U.S. cotton industry conducts both domestic and international cotton promotion programs through

Cotton Incorporated and Cotton Council International, respectively. Combating the rising use of textile polyester has fallen solely to the U.S. cotton industry. U.S. cotton producers pay a self-assessed check-off (tax) of \$1 per bale plus 0.5% of average bale value to conduct cotton promotion and research. Over the past decade this amounts to about \$2.70 per bale per year paid directly by U.S. cotton growers. The resulting promotion programs have steadily increased U.S. per capita consumption of cotton while per capita use of textile polyester has remained virtually unchanged in the past 13 years.

The growth in the U.S. retail cotton market has directly contributed to strengthening world cotton prices. If U.S. cotton consumption fails to continue to grow at the rates observed in the last 13 years, the result will be a further weakening of world cotton prices. The positive role of the U.S. cotton industry on world markets has been supported in presentations by ICAC (August 2002). *[Terry Townsend, Government Measures and the World Cotton Market, International Cotton Advisory Committee. Paper given to the 11<sup>th</sup> Australian Cotton Conference, August 2002]*

| YEAR | Retail Purchases of Fiber<br>Millions of 480-lb. Bales |                        |      |              |
|------|--|------------------------|------|--------------|
|      | Cotton   |                        |      | Polyester /3 |
|      | US 1/  | Rest of World Total 2/ |      |              |
| 1990 | 12.2   | 73.2                   | 85.4 | 39.8         |
| 1991 | 13.0   | 72.3                   | 85.3 | 42.2         |
| 1992 | 14.9   | 70.7                   | 85.6 | 45.8         |
| 1993 | 15.8   | 69.4                   | 85.2 | 48.0         |
| 1994 | 16.5   | 68.2                   | 84.7 | 52.8         |
| 1995 | 16.5   | 68.5                   | 85.0 | 56.1         |
| 1996 | 16.3   | 71.0                   | 87.3 | 60.4         |
| 1997 | 18.1   | 70.7                   | 88.8 | 70.7         |
| 1998 | 19.3   | 68.3                   | 87.6 | 74.6         |
| 1999 | 20.1   | 69.1                   | 89.2 | 82.1         |
| 2000 | 20.5   | 70.2                   | 90.7 | 87.7         |
| 2001 | 19.2   | 72.2                   | 91.4 | 89.2         |
| 2002 | 20.8   | 73.2                   | 94.0 | 94.8         |

1. US consumption estimated by National Cotton Council  
2. World consumption estimated by ICAC, RoW is residual  
3. Polyester consumption estimated PCI.

| YEAR | US Retail Cotton Market<br>Millions of 480-lb. Bales |              |              |
|------|--|--------------|--------------|
|      | Imported 1/  | US Market 2/ | Import Share |
| 1990 | 5.0  | 12.2         | 41.2%        |
| 1991 | 5.4  | 13.0         | 41.6%        |
| 1992 | 6.7  | 14.9         | 44.6%        |
| 1993 | 7.5  | 15.8         | 47.3%        |
| 1994 | 7.9  | 16.5         | 47.9%        |
| 1995 | 8.4  | 16.5         | 51.2%        |
| 1996 | 8.7  | 16.3         | 53.3%        |
| 1997 | 10.5   | 18.1         | 57.9%        |
| 1998 | 12.5   | 19.3         | 64.7%        |
| 1999 | 14.0   | 20.1         | 69.5%        |
| 2000 | 15.7   | 20.5         | 76.6%        |
| 2001 | 15.9   | 19.2         | 82.8%        |
| 2002 | 17.4   | 20.8         | 83.7%        |

1. Estimated by USDA  
2. Estimated by National Cotton Council

## **The Impact of China's Trade and Stock Policies on World Cotton Markets and Prices Was Extremely Significant in the 1999-2002 Period**

China is the giant of the world cotton industry, producing and spinning one-fourth of the world's cotton. In addition to its importance in sheer volume, China's cotton sector adds a dimension of unpredictability to world cotton trade. Uncertainty about China's likely trade position stems from both the diffuse structure of China's cotton industry, which makes it difficult to gather reliable information, and from frequent shifts in government policies affecting cotton. China's erratic and changing policies were an especially significant factor affecting world cotton markets and prices during the period between 1999-2002.

China has alternated between being a net exporter and a net importer over the last 30 years, and world prices have been strongly correlated with these shifts in trade. World prices (the A-Index) had a 62 percent correlation with China's net imports during 1977-2002. China was a closed economy at the start of this period, and while it has opened up substantially, reliable information about the availability of cotton within China remains scarce, particularly about China's cotton stocks. Thus, the rest of the world finds it difficult to predict China's upcoming demand for cotton, or the extent to which China will decide to export cotton to the rest of the world.

Cotton distribution in China has traditionally been managed by the government through the All-China Federation of Supply and Marketing Cooperatives (SMC) and its subsidiary, the Bureau of Cotton and Jute (BCJ). Prior to the reforms of September 1999 (see below), local branches of the BCJ procured the majority of China's cotton production from farmers at prices that were fixed by the government. The BCJ controlled most of China's ginning capacity, ginned the cotton, and sold it to mills in quantities and at prices determined by the government plan. The BCJ frequently incurred losses in carrying out its mandate, and these losses resulted either in non-performing loans from the Agricultural Development Bank or in additional funds allocated from the Ministry of Finance. The government maintained a strategic cotton reserve, which absorbed much of the surplus production that accumulated during the late 1990's. Exports of cotton were made mainly through Chinatex, and other government-owned trading enterprises.

China's largest spinning mills are State-owned enterprises (SOEs), which traditionally received raw cotton allocations from the BCJ at fixed prices according to a central government plan. These mills have access to government-backed credit, but are also responsible for an array of social services for their employees. Their heavy debt loads and social responsibilities have limited their economic efficiency and responsiveness to market signals. In addition to the SOEs, joint venture enterprises (JVEs) have been set up to encourage foreign investment; these mills tend to produce textiles for the export market. In addition to JVEs, much of China's apparel is produced by township-village enterprises (TVEs), which tend to fall under local, rather than national government control.

Throughout the mid- to late 1990's, China's procurement prices rose in relation to world cotton prices, stimulating surplus production and demand for cheaper, imported foreign cotton. China became a significant net cotton importer during the period 1994/95 through 1997/98; at the same time, the stocks and financial losses of the BCJ multiplied. For the 1998/99 season, procurement

prices were reduced in all provinces, but depressed world prices undermined initiatives to make China's cotton more competitive.

Since 1999, Chinese production and consumption have responded to events within China rather than in response to world market events. The government of China liberalized procurement prices for the 1999 crop and allowed entities other than the BCJ to purchase cotton directly from farmers, after obtaining licenses to do so. In addition to the liberalization of prices and trade, the local and provincial offices of the BCJ were made responsible for all new financial losses incurred through the procurement process. The main thrust of the reforms was to allow prices to float while assigning responsibility to the local and provincial government cotton companies for any losses incurred. These reforms have been largely sustained through the 2002 crop, with the exception of the Xinjiang Autonomous Region, which has maintained a procurement price floor.

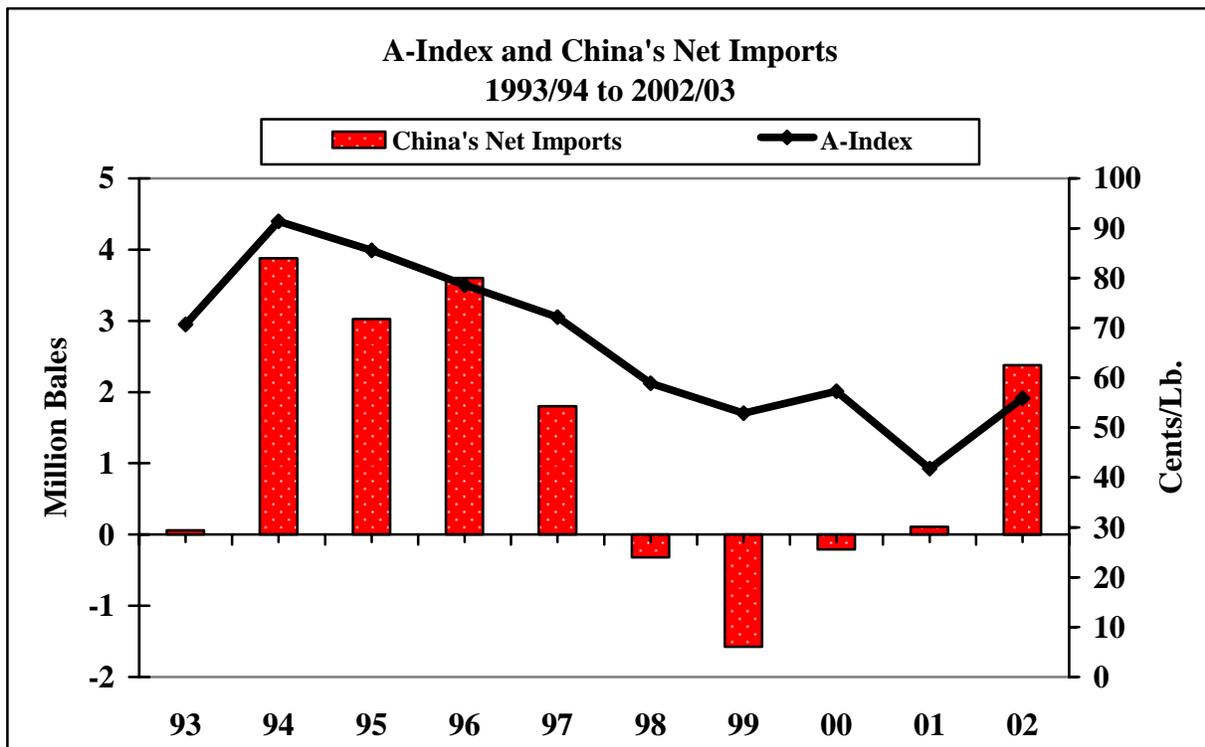
The implementation of the price reforms resulted in sharply lower production for the 1999 crop and supported higher consumption for the 1999/2000 season. The resulting shortfall enabled the government of China to begin disposing of the massive surplus stocks that had accumulated in the mid- to late 1990's. The government restricted imports and concentrated the stocks in the national government reserve, thereby absolving the local BCJ companies of the associated financial losses. It then established the China National Cotton Exchange (CNCE) in Beijing to auction the cotton. During the period October 1999-September 2001, about 2.3 million tons of mostly reserve cotton from the 1993 and later crops were sold on the CNCE (more on this below).

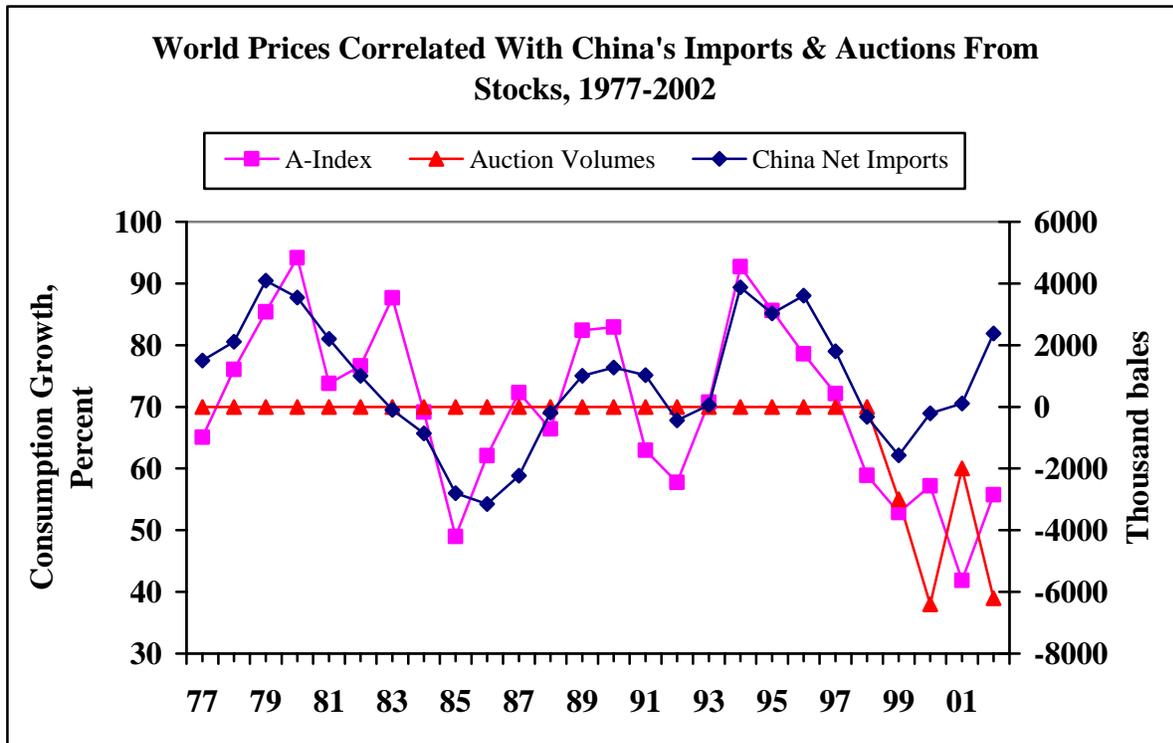
The biggest unknown behind China's import demand for cotton has been cotton stocks. Until recently, the size of China's cotton stocks was officially a state secret. While this is no longer the case, there is great uncertainty, with a wide range of estimates. USDA has revised its own estimates substantially in recent years. China was widely believed to have accumulated substantial stocks during the last half of the 1990's, but it was unclear how much of those stocks were actually spinnable – that is, in good enough condition for yarn production. Furthermore, these stocks were acquired by the government at high prices and would require acknowledging financial losses to be released onto the market. Finally, many of these stocks were in the government's "strategic reserve," and the government's strategic objectives in holding this reserve were unclear.

At the beginning of the 1999/2000 marketing year, China announced a policy of auctioning cotton from these stockpiles, with the central government accepting the financial loss. China's auctions got underway in earnest in April 2000 and continued through January 2001. This was a period of relatively high world prices compared with the preceding 8 months and the 24 months that followed. By November 2000, China's government was auctioning as much as 2.1 million bales in a single month. (World consumption of cotton in 2000/01 was 92.2 million bales for the entire year. Thus, China's government released from its stocks in one month the equivalent to 2.3 percent of the world's annual consumption.) Although China auctioned only a small amount of cotton over February-June 2001, world cotton prices fell more or less continuously through October 2001. There was a brief surge toward earlier auction levels in July and August before dropping to zero from October 2001 to April 2002.

The unpredictability of Chinese auctions had a tremendous impact on world cotton prices in 2000/01. Over the entire marketing year in 2000/01, China auctioned 6.5 million bales of cotton from its stocks, equal to 7 percent of world consumption that year.

As China's auctions continued, it became clear that the rest of the world had underestimated China's cotton stocks. China auctioned 11.6 million bales over August 1999 to July 2002 (3 million bales in 1999/2000, 6.5 million in 2000/01, and 2.1 million in 2001/02). In April 2000 USDA raised its estimates of China's 1999/2000 ending stocks by 2.7 million bales. In July 2002 USDA raised its estimate of China's 2001/02 ending stocks by 2.4 million bales. The realization that the world supply of cotton was higher than previously believed depressed prices.





**Subsidized Yarn Production led to Lower Cotton Prices**

Industrial and trade policy of major cotton textile producing countries is having a distinct imprint on world raw cotton trade and prices. Several traditional cotton producing countries are also major exporters of cotton yarn and fabric that have routinely operated complex systems of tax rebates, duty waivers and other fiscal measures in conjunction with export licensing on raw cotton. The combination of these measures has at times seen international cotton yarn offers equal to or below offering rates for raw cotton. Both Pakistan and India have conducted such policies for most of the last decade. Surges of Japanese and Chinese cotton yarn imports from Pakistan and India show the displacing effect such yarn sales can have on raw cotton trade.

**Strengthening U.S. Dollar Led To Weaker Commodity Prices, Including Cotton**

Since reaching a low in 1995, the U.S. dollar steadily appreciated until 2002 (using the ERS index on a trade-weighted basis for all agricultural trade). Between 1995 and 2002, the U.S. dollar appreciated 37 percent. When measured against cotton markets, the dollar rose 18 percent. This strengthening contributed to both lower cotton prices in U.S. dollars and rising textile imports.

Changes in the dollar price of most commodities are correlated with changes in the value of the U.S. dollar on foreign exchange markets. Exchange rates are financial variables that change independently of changes in commodity markets. However, there is a link between exchange

rates and the prices of goods in different countries—at its simplest, the price of a tradable good, adjusted by exchange rates, must be the same in every country, or trade will occur to equalize the prices. When the U.S. dollar is worth more units of foreign currency, and there is no change in the price of a commodity in the United States (in dollar terms), then the rest of the world will perceive an increase in the price paid in the United States for that commodity. This would tend to make shipments flow towards the United States, unless the U.S. price falls, and/or the price in the rest of the world rises.

Thus, a change in commodity prices necessitates a change in the ratio between commodity prices and the rest of the prices in an economy, an adjustment that will not be without costs. These costs inhibit the adjustment in relative prices. Since the United States accounts for about one-quarter of the world's economy, the prices of commodities in dollars will change more than the prices of commodities in terms of the rest of the world's currencies.

When international trade is possible, the price of a good should be the same in every country. In the long term, the rate of exchange between two countries' currencies expresses the relationship between the prices of goods in the two countries (Rogoff, 1996). In the short term, currency exchange rates are determined by foreign exchange markets and are affected by financial flows as well as trade and the prices of goods. In the short term, goods prices are influenced by changes in exchange rates.

Commodities like cotton have more flexible prices than manufactured goods and services. Commodity producers have less market power, smaller mark-ups over cost, and commodities are relatively easily traded across borders. Therefore, when exchange rates shift, commodity prices are able to change to equilibrate the prices of commodities in different countries (Dornbusch, 1987). When the rate of exchange in the currencies of two countries changes, commodity prices can change in either or both countries to offset the exchange rate change. The size of the countries involved is one factor determining which country's price will change the most. Since the United States accounts for only about 20 percent of world cotton production, much of the impact of the dollar's appreciation in recent years has been to reduce the price of cotton in dollar terms rather than raise it in terms of other currencies.

The IMF's International Financial Statistics (IFS) database includes prices for 34 commodities with data covering 1990/91-2000/01 (August-July). Virtually all of these commodity prices (27 out of 34) are correlated with the IMF's real trade-weighted U.S. exchange rate, and the IMF's overall commodity price index has a 79 percent correlation with the exchange rate index. This indicates that commodity prices in dollar terms tend to shift in line with the U.S. exchange rate. Half of these prices have at least a 40 percent correlation, including wheat (59 percent), corn (64 percent), and soybeans (75 percent). Cotton's correlation is among the highest, at 79 percent, but the commodities with correlations also exceeding 60 percent includes rice, tin, rubber, copper, hardwood, coffee, coal, and lead. The wide variety of commodities with very little in common, but whose prices tend to shift similarly with exchange rates, indicates that the impact of broad macroeconomic shifts on cotton prices in recent years.

Brazil claims U.S. cotton policy is the cause of falling cotton prices, but that theory does not explain the coincidence that prices for rubber, copper, hardwood, coffee, coal, and lead fell by similar amounts.

References:

Rogoff, K., "The purchasing power parity puzzle," *Journal of Economic Literature*, XXXIV: 647-668.

Dornbusch, R., "Exchange rates and prices," *The American Economic Review*, Vol. 77, No. 1. (Mar., 1987), pp. 93-106.

### **Strengthening U.S. Dollar Also Led To Burgeoning U.S. Textile Imports That Adversely Affected The U.S. Textile Industry and Altered U.S. Cotton Use Patterns From Domestic Uses To Exports**

U.S. cotton textile imports have increased steadily for decades, reflecting increased competitiveness of foreign producers, a strengthening U.S. dollar, and liberalization of world textile and apparel trade under the WTO's Agreement on Textiles and Clothing. For 2002, U.S. cotton textile and apparel imports rose for the 14<sup>th</sup> consecutive year, while exports remained essentially unchanged for the fifth straight year. Imports in 2002 are estimated to exceed 18 million bales of cotton equivalent, a 13-percent increase over 2001. This huge trade deficit in textiles and clothing has fundamentally changed the pattern of how U.S. grown cotton is used. As domestic mill use has fallen drastically, more U.S. cotton has been available for use by foreign mills, which then comes back to the U.S. in the form of cotton products.

Imported textile and apparel products continue to displace U.S. mill use of cotton fiber. Since peaking in 1997 at 5,441 million pounds, U.S. mill use of cotton has dropped precipitously to only 3,694 million pounds in 2002 – a 32-percent fall in only 6 years. Since 1998, U.S. exports of cotton textiles (on a cotton-equivalent basis) have increased by only 229 million pounds, while imports have grown by 2.5 billion pounds. In other words, the U.S. has absorbed more of the world's cotton production in the form of imported cotton products than it has exported onto world markets – by a factor of ten. The U.S. has not caused depressed world cotton prices but has in fact supported prices through its huge textile and apparel trade deficit.

## U.S. Cotton Use

|                 | U.S. Mill Use  | Textile Imports 1/ | Textile Exports 1/ |
|-----------------|----------------|--------------------|--------------------|
|                 | million pounds |                    |                    |
| <b>1997</b>     | 5,441          | 5,084              | 1,792              |
| <b>1998</b>     | 5,234          | 6,026              | 1,957              |
| <b>1999</b>     | 4,962          | 6,711              | 2,074              |
| <b>2000</b>     | 4,747          | 7,541              | 2,443              |
| <b>2001</b>     | 3,848          | 7,545              | 2,124              |
| <b>2002 (e)</b> | 3,694          | 8,502              | 2,186              |

1/ Raw-fiber equivalent, as calculated by the Economic Research Service, USDA.

Source: Cotton and Wool Situation and Outlook Yearbook, ERS, USDA, forthcoming for 2003.

## Policies of Other Significant Cotton Producers Have Greatly Affected World Prices

Since 1995 the inflation-adjusted price of world cotton has dropped about 50 percent. However, foreign (world minus U.S.) cotton production has dropped only 6 percent during that period. In a number of large cotton-producing countries, factors such as changing macro-economic policies, national development goals, and technical change have prevented production from falling more.

Crucial players in world cotton trade are the rising exporters of West Africa's Franc Zone, Australia, and Central Asia, primarily Uzbekistan. Cotton markets in some of the world's largest cotton producers and exporters have been insulated from changes in world prices by government policies. As a result, the rest of the world requires larger price changes to bring supply and demand into balance after shocks like a decline in world GDP growth. Uzbekistan and Turkmenistan remain centrally planned economies where world price signals have little influence. West Africa's Franc Zone has been responding to the lagged effects of its first devaluation in 50 years, offsetting much of the impact of falling world prices on its producers.

The countries of the former Soviet Union in Central Asia account for about 8 percent of world cotton production and almost 20 percent of world exports. The two most significant countries are Uzbekistan and Turkmenistan. The economic organization of cotton production in Uzbekistan has maintained significant continuity with its origins in the centrally planned economy of the Soviet Union, despite the Soviet Union's collapse and the reorientation of much of Uzbekistan's exports away from Russia and towards the world at large. Due to government procurement requirements, an overvalued exchange rate, and delayed payments to producers, farm prices in Uzbekistan are far below world prices. Changes in world prices have little effect on changes in farmers' receipts in Uzbekistan, with government margins largely absorbing the changes. Turkmenistan pursues similar policies and is likewise insulated from world price changes.

The impact of this lack of price transmission is vividly illustrated by the fact that while the world price of cotton fell 55 percent between 1994 and 2001, Central Asia's cotton area in 2002 was virtually the same as in 1995. At no point since 1995 has Central Asia's cotton area changed by

more than 4 percent from its 1995 level. During this time Central Asia has accounted for 20 percent of world exports on average, the largest source of world exports after the U.S.

West Africa's Franc Zone has accounted for 4 percent of world production in recent years, and 12 percent of world exports, and shows promise for future growth in cotton production and exports. After stagnating in the 1970s, production rose during the 1980s, and then nearly doubled as the region's currency was devalued significantly. This was in marked contrast to stagnant or declining production in the rest of Sub-Saharan Africa, and in part reflects the greater political and economic stability of these countries. In particular, the establishment of cotton production in the region benefited from the organization provided by the French *Compagnie Francaise pour le Developpement des Fibres Textiles* (CFDT). CFDT, and the local parastatals formed in each country after independence, distributed seeds and other inputs, and handled transportation, ginning, and marketing of the cotton.

The Franc Zone's yields, however, are among the lowest in the world, and have generally fallen as area has risen in the last decade. While cotton is the major cash crop for most producers in the region, competing crops do draw inputs away from cotton. Declining soil fertility, erosion, and labor availability are also factors restraining yields in some countries. The Franc Zone's ability to bring previously uncultivated land into cotton production and improve farmers' cultivation techniques will be key to the region's ability to continue expanding its production and exports. It remains to be seen how rapidly the privatization of West Africa's marketing and procurement will continue to expand. Mali, the region's largest producer is beginning divestment of the *Compagnie Malienne pour le Developpement des Textiles* (CMDT), with plans for full liberalization by 2005. The World Bank has been actively encouraging privatization in the region, which is only just getting underway.

In West Africa, the CFA Franc was devalued 50 percent in January 1994. By 2001/02, consumer prices in the region had risen more than 20 percent, but producer prices for cotton were 80 percent above pre-devaluation levels, according to the International Cotton Advisory Committee. In contrast, the A-Index in 2001/02 averaged 41 percent below its 1993/94 average.

Cotton area in the CFA franc zone in 2003 is 52 percent higher than it was in 1995, a high priced year. Even in 2000, a very low price year, cotton area was still 27 percent higher than in 1995. These trends indicate the disconnect between world prices and cotton area in the CFA franc zone, with resulting production increases that exacerbated the price declines in the early 2000's.

### **Increasing Efficiency in Commodity Production Has Depressed Prices**

Increasing efficiency in the production of food and the extraction of minerals, as well as the shifting of value closer to the consumer has depressed commodity prices in general; commodity prices tend to move together, and cotton has not been spared.

With respect to cotton, improved irrigation infrastructure has allowed area to expand into previously unproductive land. The International Service for the Acquisition of Agri-biotech

Applications (ISAAA) estimates that 20 percent of global cotton area was planted to transgenic varieties (herbicide tolerant or insect resistant or both) in 2002, up from almost none in 1996. Key cotton producing countries where transgenic varieties are now grown include China, Australia, Argentina, Mexico, South Africa, and India. While transgenic cotton varieties has not demonstrated improved yields in the U.S., in developing countries yields have risen 15 percent or more as the transgenic varieties provide more effective modes of plant protection than manual application of pesticides. Improvements in ginning and harvesting technology, notably the introduction of “module” systems have lowered costs.

Du, M. (2001). Transgenic *Bt* cotton in China (Mainland): Present conditions and prospects. *The ICAC Recorder*, Volume XIX, pp7-14.

Global Knowledge Center on Crop Biotechnology, The International Service for the Acquisition of Agri-biotech Applications (ISAAA) website  
<http://www.isaaa.org/kc/Bin/cbtupdate/index.htm>.

Ismail, Y., Bennett, R. and Morse, S. (2002). Farm- level economic impact of biotechnology: smallholder *Bt* cotton farmers in South Africa. *Outlook on Agriculture* Vol 31, pp 107-11.

Pray, C., Ma, D., Huang, J., and Qiao, F. (2001). Impact of *Bt* cotton in China. *World Development*, vol. 29:813-825.