DEVELOPMENTS IN THE ESTIMATION OF CHINA'S COTTON SUPPLY AND DEMAND

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Abstract

China is the world's largest producer, consumer, and importer of cotton; therefore, understanding China's supply and demand situation is critical to interpreting and forecasting world cotton trends. China instituted major reforms liberalizing cotton policy and structure in September 1999. In the 10 years since the reforms, information about China's cotton industry has both increased and become more transparent. At the same time, however, key difficulties persist with respect to estimating China's production, consumption, and stocks. This paper will explore the current state of information about China's supply and demand, the impacts on USDA's monthly forecasts, and prospects for improvement.

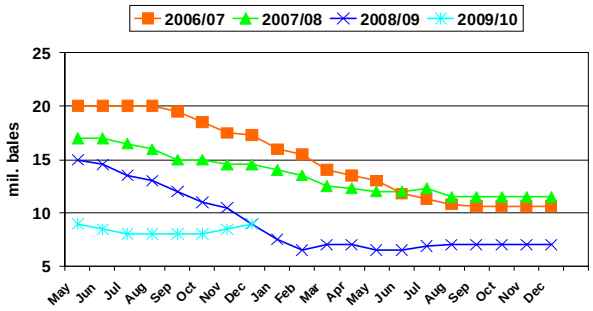
Background

In September 1999, China announced major reforms to move to a more market-based system, including: (1) the elimination of minimum procurement prices to producers; (2) opening up cotton trade to non-governmental entities; and (3) reducing the large surplus held in government reserve. At the time the reforms were instituted, the main public sources of information about China's cotton were statistics released by the National Bureau of Statistics (NBS), mainly on the production of raw cotton, yarn, and textile products, the Ministry of Agriculture (MOA), on acreage and production of raw cotton, and the Supply and Marketing Cooperatives (SMC), on raw cotton procurements, sales, and prices under the state's monopoly procurement system. As government control of cotton production and trade relaxed over the past decade, the government's ability to collect certain information diminished and new sources of information emerged (see Appendix 1). In addition, various agencies in China began publicizing information and engaging in discussions of balance sheet estimates and issues. See Appendix 1 for a summary of current sources of information about China cotton.

The size of China's cotton industry, its geographic dispersion, and recent rapid structural changes are all factors which make it difficult, even for the government of China, to collect information about supply and demand. The biggest barrier is the sheer magnitude of the industry and the numbers of entities involved. For example, in the United States, there are approximately 19,000 cotton farm operators compared to an estimated 25,000,000 in China. On the consumption side, there are approximately 1,000,000 spindles in the U.S. and 100,000,000 estimated for China (see Appendix 2). Conducting rigorous surveys on such large and diverse populations is extremely difficult. In addition to the numbers of entities involved in cotton production and processing, the existence of unlicensed, "gray market" activity also hinders the collection of information. Sources in China say that there are approximately 8,000 licensed gins, but that there may be as many as 2,000 additional unlicensed gins.

A complete representation of China's balance sheet includes estimates of production, consumption, trade, and stocks. The forecasting of imports is arguably the most critical component of the balance sheet to the world cotton trade, and is dependent on correctly assessing the supply-demand surplus or shortfall, as well as projecting government policy decisions related to the issuance of tariff rate quota licenses. Difficulties with the forecasting of production and consumption resulted in an upward bias in USDA's projections of China's imports for the past three marketing years. In marketing years 2006/07 and 2007/08, underreporting of production by agencies in China was partly responsible (see discussion below). In 2008/09, the worldwide recession reduced China's imports below USDA's initial forecasts.

USDA's Import Estimates for China by month for 2006/07 to date



Sources and Estimation of Balance Sheet Components

Trade

As with many countries, data on China's imports and exports of raw cotton are reported by the customs service; comparison of China's imports with the corresponding export data for supplying countries indicates that the data are reasonably accurate.

Stocks

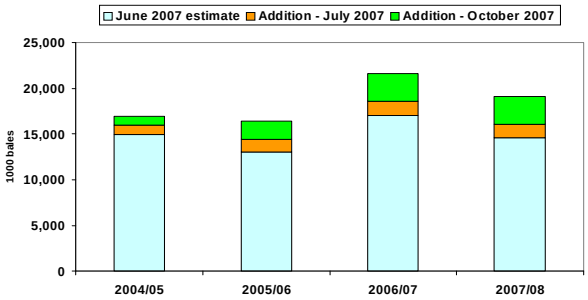
The government maintains both strategic reserves and market operation reserves. There are no official estimates of total stocks in China because the size of the government-held strategic reserve is a state secret. Agencies in China often estimate other types of stocks, including stocks held by mills and commercial entities; alternatively, they may analyze the change in stocks from the beginning to the end of a particular marketing year. Most information on stocks is usually reported on an *ad hoc* basis, e.g., by an official making a speech or statement to the press, and is often difficult to track or reconcile with other previously released information to maintain a consistent series.

While the total amount of cotton in the government reserve is unknown, information on the purchases and sales from the reserve can be remarkably open and transparent. In marketing years 2008/09 and 2009/10, the government of China first acquired and then sold a significant amount of cotton in an effort to support and stabilize prices paid to producers. The transaction volumes and prices have provided important indications about the relative tightness of supply and demand (see Gruere, 2009).

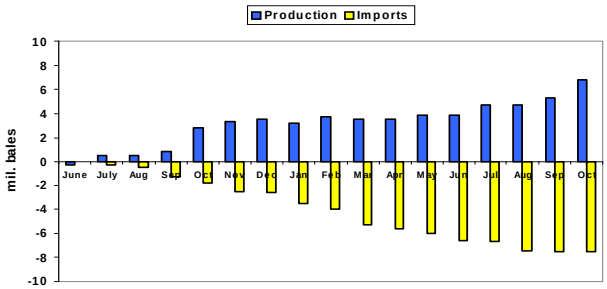
Production

Until 2007, USDA and most other cotton forecasting agencies relied mainly on statistics released by the NBS to estimate China's cotton production. The provincial branches of the NBS develop estimates by sampling fields and interviewing farmers, and these are reviewed, consolidated, and published at the national level (see Gruere, 2006). However, by mid-2007, sources in China were examining information on rail shipments of cotton from Xinjiang to eastern China and concluding that the NBS production estimates for Xinjiang were too low. In late September 2007, the high-level National Development and Reform Commission (NDRC), an agency under China's State Council, confirmed higher production estimates for the 2006 and 2007 crops. Consistent with this information, USDA made adjustments in its monthly releases for July and October of 2007 which raised estimates for the 2004/05 through 2007/08 crops by a cumulative total of 14.4 million bales.

USDA's Adjustments to Production
July and October 2007



Avg. Change from Initial May Estimates
for 2006/07 and 2007/08
China's Production and Imports



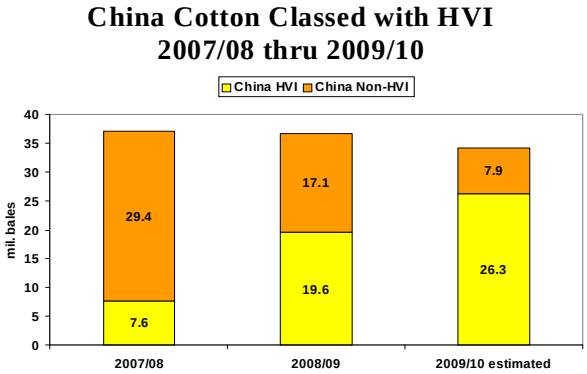
Since the adjustments of 2007, USDA has relied on multiple sources of production estimates from China, including the NBS, the NDRC, and the China Cotton Association (CCA). The NBS continues to publish estimates based on its survey methods, but does not consider other information, such as the rail car shipment data from Xinjiang. The NDRC and CCA appear to follow the NBS provincial estimates for all areas except Xinjiang; for Xinjiang, they rely on the rail car data and also on estimates of stocks remaining in Xinjiang at the end of the season. Xinjiang's geographic isolation from the rest of China and from the major mill areas makes this type of analysis a useful estimation tool. Unfortunately, there is no comparable verification method for the NBS estimate of cotton produced in provinces outside of Xinjiang, which account for over 50 percent of estimated national production.

Developments in Ginning and Classing

A key provision of the government's modernization program is to increase standard bale weights to 227 kilograms, and to expand the use of high-volume-instrument (HVI) machine classing of cotton. Sources in China report that, as of the end of 2008, about one-fourth of licensed gins had completed installation of large-bale equipment. The government has provided significant incentives to gins to convert the large bale system and to participate in the classing program, including financing for gins to convert to large bale equipment and financing to converted gins for purchasing cotton from farmers. A further incentive is that reserve purchases are limited to cotton classed under the HVI system. Also, priority access to transportation from Xinjiang to the east is given to large-bale cotton. These latter two incentives have led to rapid adoption of the big bale/HVI classing in Xinjiang. Once the classing reform program is complete, the plans are for the China Fiber Inspection Bureau (CFIB) to operate about 110 inspection facilities in the cotton producing regions (as compared to 12 across the U.S. cotton belt) running between 350 and 370 HVI systems (see Cui, 2006).

From 2007/08 to January 1, 2010, the number of gins participating in the CFIB classing system increased from 720 to 1,384, an increase of 68 percent in 2008/09 and another 14 percent to date in 2009/10. Of China's total estimated

cotton production of 37.0 million bales in 2007/08, 7.6 million or 21 percent were classed using HVI. In 2008/09, the volume of HVI-classed cotton rose to 19.6 million bales, accounting for 53 percent of estimated national production. Classing information to date suggests that about 75 percent of China's production will be classed using HVI in 2009/10. Adoption of HVI is more prevalent in Xinjiang than elsewhere in China -- in 2008/09, about 77 percent of the Xinjiang crop was classed using HVI.



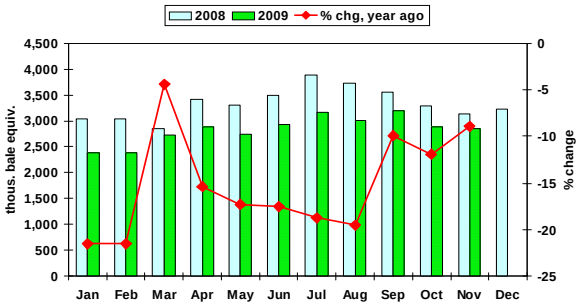
Consumption

Consumption is perhaps the most difficult component of China's balance sheet to measure and the one with the widest divergence among forecasting agencies such as USDA, the International Cotton Advisory Committee (ICAC), and Cotton Outlook. There are several methods which can be used to analyze consumption in China, but they generally do not yield similar results. Since the consumption forecast must fit within a balance sheet that includes reasonable estimates of supply and stocks, consumption is often determined by deduction rather than by using independent methods. In other words, consumption estimates for China are frequently the residual of supply, including production and imports, minus ending stocks. This is unsatisfactory for several reasons, the most important being that it compromises the balance sheet's utility as an import forecasting tool.

The monthly yarn production data published by the NBS is often used as the basis for developing estimates of cotton consumption in China, largely because this is the only official information published by the government directly related to cotton consumption (see Colby and Gruere, 2007). However, uncertainties in the way NBS collects yarn production data, peculiarities in the way they are published, and the 15-percent revision of the survey-based estimate for 2004 following the release of the 2004 Economic Census, means that using the yarn production statistics to generate a China consumption estimate is fraught with difficulty. In addition, little is known about the three variables that are necessary to estimate cotton consumption based on yarn production statistics, i.e. 1) the cotton fiber share in yarn, 2) cotton waste percentage during spinning, and 3) non-mill use of cotton. Using the NBS yarn production statistics and assuming a low cotton fiber share, low waste percentage, and low non-mill use figure, the resulting consumption estimates surpass available supply by very significant and growing amounts beginning in 2006/07. Under the low share, waste, and low non-mill use assumptions, the NBS yarn production statistics for 2008/09 suggest a consumption figure 12 to 13 million bales higher than the current USDA estimate.

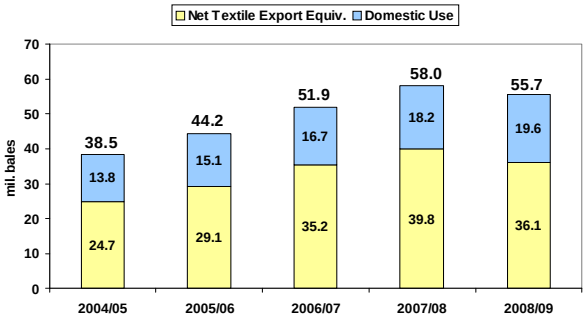
Another method for analyzing China's cotton consumption was developed by Stephen MacDonald of USDA's Economic Research Service in 2007. This method extracts estimates of the raw cotton fiber equivalence (mill use level), by weight, for China's textile imports and exports, and thus has the advantage of relying on trade statistics, which are both more consistently available and reliable than other consumption indicators. USDA used China's net textile exports to help estimate the impacts of the recent severe economic downturn on China and world consumption.

China's Net Textile Exports by Month, 2008 and 2009,
raw fiber equivalents



The difficulty with this method is that no data exists comparable to the net textile trade data to estimate consumer use of cotton within China. MacDonald proposed several methods to approximate consumer use, one of which was choosing a base-year intercept and correlating subsequent domestic market growth with growth in China's economy (GDP). Extending MacDonald's 2007 analysis basing domestic consumption on GDP growth since 2004/05, China's total consumption would be about 56 million bales in 2008/09, including 36 million for net textile exports and 20 million for the domestic market. This compares with USDA's current estimate of 45.0 million bales, ICAC's estimate of 41.3 million, and Cotton Outlook's estimate of 39.0 million.

China Consumption Calculations
based on Net Cotton Textile Exports
plus Domestic Consumer Use (GDP-based)



Conclusions

Since China instituted the cotton reforms of September 1999, agencies in China have expanded the collection and publication of information about supply and demand. The National Bureau of Statistics continues to report survey results for production of both cotton and yarn, but it is no longer the single, authoritative source that it was ten years ago. Some improvements have resulted from the additional resources devoted to data and analysis, notably the use of rail car information to verify production in Xinjiang, the reporting of market prices, and data on transactions in and out of the government reserve. However, uncertainties with regard to production, consumption, and stocks continue to hinder the estimation of the balance sheet, and in particular the forecasting of imports, which is critical intelligence for the world cotton market. With the exception of the amount of stocks held in the government's strategic reserve, which are kept secret as a matter of policy, the primary impediment is the very large number of entities—mainly producers and mills—from whom information needs to be collected. That some of these entities are unlicensed, "gray market" operations exacerbates the problem.

The government of China's program to modernize the ginning and classing system could result in the improvement of statistics on production within the next few years. In many cotton-producing countries, particularly developing countries, production estimates are based on activity at gins, which effectively concentrates reporting and reduces dependence on information from large numbers of small-plot producers. If comprehensive, reliable ginning and/or classing data could be made available, it would provide independent verification of the NBS survey results, similar to that provided by the rail data for Xinjiang beginning in 2006. And if new data results in further significant adjustments to estimates of production, this would also have implications for the demand side of the balance sheet, especially consumption.

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Appendix 1. Sources in China Reporting on China's Cotton Production and Consumption

Production:

Agency	Information	Sources/Methods	Schedule
National Development Reform Commission (NDRC)	National area and production	Based on agencies reporting to central government	Irregular; broadcast conference call in Sept.
China Cotton Association	National area and production; often reports individual estimates for Xinjiang	Consortium of industry groups; acreage estimates based on survey of the CCA Cotton Production Monitoring Project Group covering roughly 100 to 150 counties in key producing provinces	Irregular; updates average about 6 times per year
National Bureau of Statistics	National and provincial area and production	Surveys of farmers and fields in production areas	February, June, and Statistical Yearbook (fall)
Ministry of Agriculture	National and provincial area and production	Surveys of farmers' planting intentions and progress during the growing season	December (prior to planting), May, and August
China Cotton Market Monitoring Information System (CCMMIS)	National and provincial area and production	Surveys of farmers and fields in production areas; use same farms year after year; system has 200 monitoring stations and surveys roughly 8,000 growers	Intentions survey, 2-3 crop development reports, and post harvest survey
Cotton Fibre Inspection Bureau	Quantity and quality classing data by gin	Actual classing results	Daily during classing season

Consumption:

Agency	Information	Sources/Methods	Schedule
National Development Reform Commission (NDRC)	Total China cotton consumption	Based on agencies reporting to central government	Monthly Cotton Report
China Cotton Association	Total China cotton consumption	Based on reports from consortium industries and government agencies, including assessment of yarn production	Irregular; a discussion of supply and demand is included in Monthly Cotton Report
National Bureau of Statistics	National and provincial yarn production	Monthly yarn output data based on survey of large mills; small mills estimated based on previous year-end small mill survey; every 5 years, a more complete enumeration occurs as part of Economic Census	Monthly and annual data releases; economic census results released every 5 years
China Cotton Market Monitoring Information System (CCMMIS)	Total China cotton consumption and Monthly mill cotton stocks	Consumption estimate methodology unknown; stock estimates based on monthly mill survey	CNCotton Monthly Cotton Report on supply and demand trends and CNCotton Monthly Cotton Stock Report
Textile industry representatives	Total China cotton consumption	Methodology unknown, though consumption estimates usually paired with a discussion of yarn production	Irregular

Appendix 2: Estimates of U.S. and Chinese Entities Engaged in Cotton Production and Consumption

Item	Unit	U.S.	China
Farming operations	#	18,605	25,000,000
Area planted, 2009	mil. acres	9.1	12.8
Average farm size	acres	489	0.5
Gins	#	734	9,000
Spindles	#	1,033,000	100,000,000

Sources:
U.S. data on farms, gins, and area planted from National Agricultural Statistics Service, USDA; spindles from U.S. Bureau of the Census.
China planted area from official USDA statistics. Other data consensus of government and agency contacts collected by Foreign Agricultural Service, Beijing office.