

COTTON FUTURES EXCHANGES: THEIR PAST, THEIR PRESENT AND THEIR FUTURE

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Abstract

Throughout the late 19th and 20th centuries a number of cotton futures exchanges have been in operation in both developing and developed countries. The New York Cotton Exchange is the longest running exchange with continuous operation for more than 130 years. This paper examines the conditions under which these exchanges were developed as well as the reasons they ceased to operate — ranging from lack of interest by hedgers and speculators to outright government prohibition. The paper also discusses a number of new initiatives that are under way and assesses the probability that at least one of them will become a successful operation.

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Introduction

The volatile nature of commodity prices has created the need to manage risk. The most common risk mitigation device has been the use of futures and options contracts. Such contracts have typically been traded at organized futures exchanges which in turn have played an essential role in risk management. This paper focuses on the history of cotton futures exchanges and examines future prospects. In particular, we identify historical and socioeconomic conditions as well as the policy environment under which cotton futures exchanges were developed, what led to their success, and the reasons for their demise. Based on this information we attempt to evaluate the likely developments in the cotton futures markets following recent initiatives to introduce cotton futures contracts.

Cotton is of special interest for a number of reasons. First, cotton is produced in many countries (in both temperate and tropical zones) and it is consumed in virtually every country, thus making it a highly tradable commodity. Second, cotton has been traded for hundreds of years and hence events such as wars or heavy interventions of major players are likely to have impacted the cotton market more than any other commodity market. Third, cotton futures exchanges were the first “global trading institutions” in the sense that their futures prices were influenced by global demand and supply.

Historians have credited Japan with the birth of futures trading, tracing the establishment of the first rice exchange back to the mid-18th century. In 1730, rice futures were formally traded in the Dojima Rice Market (Markham, 1987). During the late 19th and early 20th centuries commodity futures exchanges flourished. For example, Carlton (1984) reported that between 1921 and 1983, more than 180 different futures markets existed in the US. Earlier in the 20th century the São Paulo Commodity Exchange was trading futures contracts on coffee, cotton, sugar and rice (BMSP, 1997). In India, following the introduction of cotton futures in 1921, both futures and option trading expanded to cover a variety of commodities such as oilseeds and products, potatoes, sugar, foodgrains, and gold (World Bank, 1996).

The history of cotton futures exchanges dates back to the late part of the 19th century when cotton was traded in futures exchanges located in Egypt, the US, the UK, and France. In the early 20th century, cotton futures contracts were traded in China, Germany, India, and Japan while later Pakistan, the UK, and Hong Kong introduced cotton contracts. With the exception of the New York Cotton Exchange, however, all cotton futures exchanges ceased operations. In fact, if one excludes some sporadic trading at the São Paulo Commodity Exchange up to 1989, the only exchange in the world trading cotton futures for the 15-year period between 1981 and 1996 was the New York Cotton Exchange (Evans and Mahoney, 1997). In the last five years many countries have expressed interest in introducing cotton futures exchanges. A few of them, namely Brazil and India, have already launched cotton futures contracts. Others (i.e., Turkey, China, and the European Trading Alliance) are contemplating new initiatives.

The remainder of the paper proceeds as follows. The next section gives a brief history of the production and trade of cotton, starting from pre-historic times up to the end of the 18th century when relatively accurate statistics on production and trade became available. Section III goes through the history of cotton futures exchanges while section IV gives a synthesis of the conditions under which these exchanges were developed and the reasons of their demise. Section V discusses recent and new initiatives while the last section elaborates on the likelihood that one of these initiatives will become successful.

The Early History of Cotton in Brief

According to sources cited in Berger (1969), the oldest archeological record of cotton textiles was found in Pakistan (200 miles north of Karachi) and dates back to 3000 B.C.¹ Cotton specimens which had been made into textiles have also been located in Northern Peru, dating as far back as 2500 B.C. Prehistoric traces of cotton have also been located in the US (Arizona).

The first historical reference to cotton comes from Herodotus (484–425 B.C.) who described cotton grown in India as “... trees which grow wild, the fruit of which is a wool exceeding in beauty and goodness that of sheep. The Indians make their clothes of this tree wool” (quotation cited in Berger, p. 12). Nearchus, the admiral of Alexander the Great, also reported about 325 B.C. on cotton growing in the Indus river valley and around the shores of the Arabian Sea and Persian Gulf. Strabo (63 B.C. – 24 A.D.) mentions cotton as a product of Persia before the commencement of the Christian era. Cotton growing in Egypt is first reported by Pliny (23–79 A.D.) while Josephus (37–100 A.D.) reports cotton cultivation in Palestine. Arrian (95?–175? A.D.) enumerates cotton fabric imports by the Romans from India around 150 A.D. Cotton was brought to Southern Europe (Greece, Sicily, and Spain) by Arab traders during the 9th and 10th centuries A.D. (Ellison, 1886). Cotton was first cultivated in the US in 1621 (Donnell, 1872).²

The first imports of cotton to England are reported to have taken place in 1298 for the manufacture of candle-wicks. Brazilian cotton was marketed at Ulm (Germany) in 1570. Production and trade of cotton expanded significantly at the beginning of the 19th century, following the installation of the first spinning mill in the US (Beverly, Massachusetts) in 1787 and the invention of the ginning machine by Eli Whitney in 1793.³ During the 40-year period 1791-1831, world cotton production increased from 213,000 to 372,000 tons, with most of the growth accounted for by the US whose production increased from virtually nothing to 175,000 tons during the same time period (Table 1). By 1860 cotton consumption by major consumers exceeded half a million tons, 60% of which was accounted for by England (Table 2). By 1880, total cotton imports to Europe exceeded one million tons, 70% of which was supplied by the US (Table 3).

Cotton Futures Exchanges: Their History

Cotton futures trading started as early as the mid-1800s, first in Alexandria (Egypt) and shortly thereafter in New York and Liverpool. By the end of the 19th century there were five cotton futures exchanges in operation (two in the US, two in Europe, and one in Egypt). Throughout the 19th and 20th centuries there had been a total of at least 15 cotton futures exchanges operating around the world. A review of these exchanges is undertaken in the remainder of this section. Table 4 reports the periods during which the Exchanges were active.

Before we proceed with the review, however, a brief note on the definition of futures and options contracts is in order. A futures contract is an agreement to purchase or sell a given quantity of a commodity at a predetermined price, with settlement to take place at a future date. Unlike forward contracts, delivery of futures contracts seldom takes place; the difference between the agreed and spot price at the time of contract expiration is typically settled through a cash transaction. An option contract gives the right or the ‘option’, but not the obligation, to make (put option) or take (call option) delivery of the commodity (directly or through a futures contract) at a prearranged or the ‘strike price’.⁴ For this contract, the buyer or seller of the option has to pay a price at the time of contracting which is called the ‘premium.’⁵ In effect, an option contract provides price insurance. Although the concepts of futures and options contracts have remained largely unchanged over time, the institutions behind them as well as the governing rules and regulations have evolved considerably.

Egypt: The Alexandria Cotton Exchange (1861-1961)

Cotton was first grown commercially in Egypt in the 1820s. To develop and subsequently protect the domestic textile industry, the government of Egypt initially promoted cotton production and handled all marketing and trade through a parastatal. By 1849 cotton had become a vital element of the Egyptian economy; the subsector was liberalized and Egypt became a major cotton exporter.

The rapid expansion of the sector created the opportunity to manage price risk, and this gave birth to the Alexandria Cotton Futures Exchange, the first cotton futures exchange in the world (Hafez, 1946). Although the Exchange was formally established in 1861, cotton futures contracts were traded on an informal basis as soon as liberalization took place in 1849. Perhaps, the Exchange owes its creation to the liberal marketing and trade environment prevailing at that time.

Another reason for the relatively quick establishment of the Exchange was the prevailing views regarding speculation. In many places futures trading by speculators at that time was considered to be a form of gambling and thus an illegal activity. In the US, for instance, the 1867 Illinois Elevator bill declared that (Hieronymus, p. 85):

All contracts for the sale of grain for future delivery, except in cases where the seller is the owner or agent of the owner of such grain at the time of making of the contract and in actual possession thereof, are hereby declared void and gambling contracts ...

On the contrary, speculation in Egypt was deemed legal. Hafez (1946), for example, succinctly summarized this view as follows (p. 78):

The establishment of this market [i.e. the Alexandria Cotton Futures Exchange] did not meet with any legal difficulty owing to the non-prohibition of this form of transaction, whereas it was considered illegal to establish such markets in other countries, as dealing in futures was prohibited and considered a form of gambling.

The articles of operation of the Alexandria Cotton Exchange, which shaped it into a modern exchange, were issued in 1927. Initially, only one contract was traded (brown cotton). After experimenting with different contracts for a number of years, the following contracts were traded by 1936: Sakellaridis and Giza 7 (delivered in odd months) and Ashmouni (delivered in even months). The contract size was 250 kentars (equivalent to 2,500 pounds). There was also a cottonseed contract traded in all months except October.

Until World War II, the Exchange operated uninterrupted and was the most influential factor behind the cotton pricing mechanism in Egypt. Notwithstanding its success, the Exchange entered a turbulent period after World War II. Consistent with the central planning thinking of the government of Egypt, the view that speculation should not be taking place was gaining popularity and eventually prevailed in the policy-making arena. Hansen and Marzouk (1965), for example, wrote (p. 97):

Futures markets, however, have always been suspect as the playground of speculative forces. Against the activities in the Alexandria futures market in particular, it has been objected that since it is in the hands of a limited number of powerful dealers, with expectations shifting continually between bullishness and bearishness, and since an increasing number of very big buyers, foreign governments, in particular from Eastern bloc countries, organizations, and so on, have entered on the demand side, it has become unable to offer the hedging facilities so much needed by producers and others, which were its original *raison d'être*.

As a result, the Exchange closed from 1952 to 1955 in addition to being closed from 1940 to 1949 due to World War II. Although from 1955 on it was open, with a short interruption during the Suez War, control over prices and trade of cotton was exercised at the national level by the Egyptian Cotton Commission (Abdel-Fadil, 1975). In particular, under legislation enacted in June 1953, all cotton to be exported or delivered to domestic textile mills had to be accompanied by a certificate indicating that it had been purchased from the Cotton Commission, which itself would frequently trade futures contracts at the Exchange. The Exchange lost its economic basis for existence and its functions were officially suspended in 1961 — the year which ironically marked its 100th birthday. In numerous occasions industry groups in Egypt have attempted to revive the Alexandria Cotton Exchange without success. Today Egypt is the second largest producer of extra long staple cotton (following the US) and it now intervenes in the sector rather heavily.

US: The New York Cotton Exchange (1870-)

The New York Cotton Exchange (NYCE), the largest cotton futures exchange in the world, has been trading futures contracts since October 1, 1870.⁶ Except for temporarily suspending its operations at the outbreak of World War I in 1914 and during the Bank crisis of 1933, NYCE has been continuously in operation ever since. In fact, cotton is one of the three contracts that have been continuously listed in the *Wall Street Journal* since the 1920s — the other two are wheat on the Minneapolis Grain Exchange, and oats on the Chicago Board of Trade (Carlton, 1984). Initially, cotton futures trading was regulated by the Cotton Futures Act, passed by the US Congress in 1914. In 1922, the Congress enacted the Commodity Exchange Act which regulated the transactions on grain futures exchanges. In 1936, the Act extended its application to all commodities including cotton.

Between 1950 and the early 1970s, NYCE exhibited an extraordinary low turnover, a result of the US government's policy of maintaining large cotton stocks — the Commodity Credit Corporation (CCC) bought and sold most of the US cotton thus eliminating the need for cotton hedging by merchants (Hieronymus, 1977). For example, in 1966, CCC accounted for 73% of cotton carryover (Emery, 1975). The government's interference in the cotton market was so severe that it almost led to the demise of the Exchange. In 1966 NYCE traded only 730 contracts — a daily average of 3 contracts — prompting Parry (1982) to write (p. 82): "Despite the low turnover, the New York Cotton Exchange did not die..." Following the 1973

commodity price boom and subsequent withdrawal of the CCC from commodity markets, NYCE regained prominence and by 1975 its trading volume reached an annual average of half a million contracts.

Currently, the NYCE contract, whose size is 50,000 pounds, uses Memphis No. 2 cotton as the cash price equivalent for quality specification and delivery purposes. There are five delivery months (March, May, July, October, and December). While initially (i.e. early in the 20th century) the contract could be traded up to 12 months, currently the nearest ten delivery months are available for trade, which extend the time span of the contract to almost two years — a July 2001 contract, for example, could be traded as early as August 1999. The NYCE, which is regulated by the Commodity Futures Trading Commission (a US government entity established in 1974), to this day is considered the most important cotton futures trading center in the world.

US: The New Orleans Cotton Exchange (1880-1964)

In addition to NYCE, the New Orleans Cotton Exchange was trading cotton in the US (it was also trading a cottonseed oil futures contracts.)⁷ Although the Exchange officially operated since 1871, trading of futures contracts started almost a decade later (Hieronymus, 1977).

The New Orleans Cotton Exchange traded two contracts (50,000 and 25,000 pounds) with similar characteristics to the NYCE contract; i.e. delivery taking place in the months of March, May, July, October, and December and regulated by the Commodity Exchange Act. Contracts could be traded for as far ahead as the traders wished but typically the trade was confined to a year. As with NYCE, the New Orleans Cotton Exchange interrupted its operations for four months (July-November 1914) due to World War I and briefly during the Bank crisis in March 1933 (Boyle, 1935).

The US government's policy of maintaining large stocks of cotton through CCC between the 1950s and the early 1970s inevitably drew cotton merchants and speculators out of the New Orleans Cotton market as was the case with NYCE. Hence, the importance of the Exchange gradually declined and its operations were officially terminated on July 9, 1964. Efforts to revive the Exchange in the mid-1970s failed.

UK: The Liverpool Cotton Exchange (1882-1964)

Cotton futures trading in Liverpool has a rather long history. According to Dumbell (1923) cotton trade was taking place in Liverpool on a small scale as early as the mid-18th century. Cox (1925) makes reference to speculation at the Liverpool cotton market as early as the beginnings of the 19th century. Two events that shaped the futures trading of cotton at the Liverpool market are the invention of the steamship and the installation of the transatlantic cable (Rees, 1972).

With the expanded use of the steamship in about 1840 to 1850, the time to cross the Atlantic was reduced from two months to 8-10 days. This allowed information on demand and supply conditions in the US, the major cotton supplier to the UK, along with cotton samples to arrive much earlier than the cotton itself because cotton was transported by sailship. Based on this information, cotton merchants in Liverpool were trading forward contracts, called 'to arrive' or 'in transit', two months prior to the physical transaction. Moreover, the successful installation of the transatlantic cable in 1865 made information instantaneously available on both sides of the Atlantic, and intensified the trade of contracts 'to arrive'.⁸ Dumbell (1927), for example, in comparing the transmission of information to actual cotton arrival, wrote (p. 259):

So long as cotton and news travelled across the sea at the same pace there could be no volume of dealings except in cotton on the spot. But as soon as the mail steamer, carrying letters and samples, outstripped the sailing ship with its cargo of cotton, that cargo could be bought and sold while still at sea. The gradual extinction of the sailing ship would have eliminated the time interval which made that practice possible, but in the meantime the telegraph came to magnify and perpetuate the difference between the transmission of news and the shipment of cotton.

The first rules of futures trading were adopted in the mid-1860s by the Liverpool Cotton Brokers Association by gradually amending the original 'to arrive' contracts.⁹ Following efforts by the Brokers Association in 1870 to increase market efficiency and also create a 'hedging' medium, a clearing house was organized in 1874 while in 1878 the "Cotton Brokers' Bank" — a branch of the Bank of England — was formed. Finally, the Liverpool Cotton Association was created in 1882 as a result of settling the split between merchants and brokers which had taken place a few years earlier (Ellison, 1886).¹⁰

Futures trading was formally introduced at the Liverpool Cotton Exchange in 1882 under the aegis of the Liverpool Cotton Association. Initially, four contracts were listed: an American contract, an 'empire and miscellaneous growths' contract (which also included Indian cotton but attracted very little attention), and two Egyptian contracts (Garside, 1935). The size of the contracts, which were traded in British pounds, was 48,000 pounds and they could be traded up to 25 months ahead.

The cotton futures trading in Liverpool, as was the case with other futures markets, was suspended with the outbreak of World War II. The Exchange resumed operations in 1954 by introducing one American cotton contract; two Egyptian contracts were also introduced later without success. The post-war level of trading activity, however, had been much lower than the pre-war level while the trend had been downward with very little speculation taking place. Between 1954 and 1957, for example, only 5,800, 3,200, 2,000, and 1,000 contracts were traded. The principal reason for the limited scale of futures trading in the post-war period was government intervention in most cotton-producing countries, including the US, Egypt, and Sudan. As Yamey (1959) pointed out (p. 24): “These controls have necessarily led to a contraction of futures trading, a type of trading which flourishes in conditions in which neither public nor private market controls are operative.” Responding to these circumstances, the Exchange officially terminated trading of cotton futures in 1964. Today Liverpool houses the Liverpool Cotton Association, the world’s most important cotton association which exercises arbitral authority, Cotlook Limited, a major private cotton market monitoring company which among other activities publishes the Cotlook A and B Indices, as well as numerous cotton merchants.

France: The Havre Futures Market (1882-1965)

Havre, the main cotton trading center in France, operated a futures market from 1882 by trading primarily American cotton; it also traded coffee, pepper, and wool. The contract size was 11,000 kgs (24,350 pounds), deliverable in the months of January, March, May, July, October, and December and could be traded up to a year ahead (Garside, 1935). The Exchange, which initially was trading American cotton, was working in partnership with the New Orleans Cotton Exchange until the beginning of the 20th century (as had been the case with the exchanges of New York and Liverpool).¹¹ However, cotton from French colonies dominated trade at the Havre Market after World War I. The decolonization of Africa and the lack of trading activity after the mid-1950’s led to a substantial reduction of trading volume. The Exchange officially suspended futures trading in 1965. The port of Havre, however, remains the dominant center of cotton imports to France.

Japan: The Osaka Sampin Exchange (1910-1941)

Osaka was the major cotton trading center of Japan. It traded American, Chinese, and Indian cotton. The Osaka Sampin Exchange was established in 1894 and was originally planning to trade futures contracts on raw cotton, cotton yarn, and cotton cloth (Garside, 1935). From 1894 to 1910 the trading was confined to cotton yarn only while futures trading in raw cotton of American origin was instituted in 1910. The cotton contract was equal to 4,800 pounds and trading was confined to delivery in the current month and the succeeding six months. The contract was traded for four years, discontinued trading in 1914, and was re-introduced in 1927. Most of the trading was for account of Japan but some orders from China, India, and other countries were occasionally executed. The Exchange closed in 1941 due to World War II. Although it reopened in 1951, the cotton contract was not introduced again. Currently, a cotton yarn contract is traded at the Osaka Mercantile Exchange.

China: The Shanghai Cotton Exchange (1911-1941)

Shanghai was one of the largest cotton trading centers of the world. It traded Chinese, American, and Indian cotton. The Shanghai Cotton Exchange, which was established with the help of British and Japanese traders involved in the successful opening of the Osaka Sampin Exchange, introduced futures trading in 1911 and was mainly trading Chinese cotton. The size of the contract changed several times over the years, ranging between 4,000 and 8,500 pounds. For the longest period of its operation, the Exchange traded two contracts with delivery twice a year, trading for four months ahead. During the 1920s Shanghai’s Cotton Exchange volume equaled about one-third of the Chinese production. The trading volume fluctuated significantly in the 1930s. The Exchange closed in 1941 following the outbreak of World War II and attempts to re-open it after the war were unsuccessful due to government’s opposition.

Germany: The Bremen Cotton Exchange (1914-1971)

Bremen has been the major cotton trading center in Germany since late 19th century. The Committee for the Trade of Cotton was founded in 1872 by cotton traders and brokers. The committee established the Bremen Cotton Practices from which the rules of the Bremen Cotton Exchange emerged. Futures contracts were first traded in Bremen in 1914. The outbreak of World War I forced the Exchange to cease its activities. Although the cotton market became active in 1919, trading of futures contracts did not re-emerge until six years later, primarily because quotations in foreign exchange were prohibited while the hyperinflation prevented the German mark from being used for quotations (Bremen Baumwollbörse, 1997). Futures trading resumed in 1925 and contracts were delivered in various months up to one year ahead, traded in \$US (Garside, 1935). The Exchange was trading American cotton with a trading unit of 11,340 kgs (equivalent to 25,000 pounds, half the size of the US exchanges).

The Bremen Cotton Exchange closed in 1939 because of World War II and resumed operations in 1956. The new contract of 11,000 kgs was delivered in March, May, July, October, and December and was traded in German marks. As was the case with the Liverpool Cotton Exchange, the newly established Bremen contract did not attract an adequate number of speculators, hence it never reached the pre-war level of trading activity. Reflecting upon the low turn-over of contracts, the

Bremen Board of Directors decided to discontinue quoting futures prices in December 1971 (Bremen Baumwollbörse, 1972). The Bremen Cotton Exchange remains the main spot cotton trading center in Germany.

Brazil: The São Paulo Commodity Exchange (1919-1989)

The São Paulo Commodity Exchange was established in 1917 (BMSP, 1987). It first traded cotton futures in 1919, with a contract size of 500 arrobas (equivalent to 7,500 kgs). In 1922, the trading volume reached 14,000 contracts and by 1926 cotton-related activities were the Exchange's major sources of income, followed by sugar and rice. However, in the 3-year period following the 1929 financial crisis the volume dropped by 90% compared to the same period prior to the crisis.

Trading of cotton futures at the São Paulo Exchange flourished during World War II, with a trading volume of 43,000 contracts in 1941 and an average of 200,000 contracts between 1944 and 1946. During the 1950s, however, futures trading declined again. In 1953, the Exchange recorded its worse performance with a volume of less than 700 contracts, while little over 1,600 contracts were traded annually between 1956 and 1959; gradually, the cotton futures market lost its importance and the contract ceased trading. In 1968, the contract was reinstated and, although during 1975-86 the Exchange traded an annual average of 350,000 contracts, the volume declined again and in 1989 the contract ceased trading once more, leaving NYCE as the only exchange in the world trading cotton futures.

India: The Bombay Cotton Exchange (1922-1966)

India has a rather long history of futures trading. Trading of cotton futures started informally in 1875 after the country emerged as a major cotton exporter, following the disruption in US cotton supplies to the UK due to the American Civil War.¹² Cotton futures trading was formally introduced in 1922 when the government of Bombay enacted the Cotton Contracts Act which granted recognition to the East India Cotton Association and gave it the authority to administer a cotton futures contract equivalent to 19,600 pounds. Because of price ceilings imposed by the government, the futures market closed in 1929. When it reopened in 1932, more regulations were put into place. In 1952 the government prohibited the trade of options (under the Forward Contracts Regulation Act) and limited the flexibility of the futures contract in turn making it similar to a forward contract.

In 1966 the Indian government prohibited the trade of cotton futures altogether (along with a number of other commodities). The official reason given for the prohibition was that cotton producers, who were supposed to be the intended beneficiaries of the futures market, were not receiving any benefits. Furthermore, it was believed that futures trading is appropriate only when the commodity is abundantly available. For example, Lal and Parmar (1995) who appear to subscribe to this view, wrote (p. 146) "... the government of India suspended the same [i.e. cotton futures trading] because of the persistent shortage in cotton and the strident rise in prices."

Pavaskar (1971), however, opposed this view by showing that the futures pricing mechanism in India was indeed efficient; in fact when he compared his findings with those of Dow (1941), he found that the Bombay market was more efficient than Liverpool. Moreover, earlier Pavaskar (1969) had argued that the real reason behind the prohibition of the cotton futures trading was the strong lobby of the textile industry which had vested interests in limiting (or even banning) cotton exports in order to keep domestic cotton prices lower than their world counterparts. In particular, he wrote on this issue (p. 1995):

Strange as it may seem, these attacks [on cotton futures] have largely emanated from the private sector representing organized industry. The latest target of such attacks is the jute goods futures market. The economic arguments advanced in support of all these attacks have a ring of familiarity; but their motivation appears to be far more subtle than is *prima facie* apparent. What seems to be at stake is not so much the economic institution of futures market, but the competitive element in the entire pricing system.

The Indian government attempted to introduce the cotton futures contract again in 1987, albeit without success (Lal and Parmar, 1995). India, world's third cotton producer uses almost all of its cotton for its textile industry.

US: The Chicago Board of Trade (1924-1964)

Although the Chicago Board of Trade — by many accounts one of the oldest and largest organized futures markets in the world — was known for grain trading, it introduced a cotton futures contract in December of 1924. The size of the contract was 25,000 pounds and it was supposed to represent cotton grown in Texas (some of its characteristics were similar to the NYCE contract.) Despite being located at the most important futures trading center of the world, the Chicago contract never played an important role in the US cotton market as cotton trading was overshadowed by the Exchanges of New York and New Orleans (Brand, 1964). Evidence also indicates that merchants and traders did not find the contract useful because its quality specifications were too narrow to fit the type of cotton it was supposed to represent. During the 1950s the Chicago contract fell into dormancy and was eventually delisted from the Board in 1964.

Pakistan: The Karachi Cotton Exchange (1955-1971)

Trading of cotton futures in Pakistan commenced in 1955. The Karachi Cotton Association developed the rules for operating a futures market similar to those existing in other countries. The importance of a liberalized policy environment was also recognized in Pakistan. For example, Farooqui, Keaton, and Miller (1958) wrote (p. 169): “Again, here it is historically true that the free market can do a much better job without restrictions.” It has been estimated that about 70% of the cotton produced in Pakistan was going through the Karachi Cotton Exchange. Only one futures contract was traded (Sind NT fine) with four delivery months (January, March, May, and July).

In 1971, the government of Pakistan introduced the price program under which the Cotton Export Corporation, a public enterprise, became the bulk purchaser of cotton. The main features of the price program (which was fully implemented in 1976) were to provide guarantee prices to cotton producers, fix ginning charges, levy export duty, and ultimately dictate how much cotton was to be exported (Huque, 1987). It was under this program that futures trading at the Karachi Cotton Exchange was terminated in 1971. Currently, although cotton is marketed and traded in a relatively intervention-free environment, the exchange facilitates only a small number of spot transactions. Pakistan, the world’s fourth largest cotton producer, uses its cotton for its textile industry.

UK: The London Commodity Exchange (1969-1975)

Following the closure of the Liverpool and Havre Exchanges, the need for a hedging instrument in the European cotton market again became apparent. Responding to this need and based on the Liverpool experience, the London Commodity Exchange introduced a cotton futures contract in 1969 (Rees, 1972). In order to capture a significant part of continental European trade, delivery points were set to be in Belgium and Holland while the trading currency was \$US. The size of the new (American) cotton contract was 22,050 pounds (10,000 kgs). However, as was the case with the continental European Exchanges, the contract did not receive adequate attention by cotton merchants and eventually was delisted from the Exchange in 1975.

Hong Kong: The Hong Kong Commodity Exchange (1977-1981)

The Hong Kong Commodity Exchange introduced a cotton futures contract in May 1977 — along with contracts on sugar, soybeans and gold (Parry, 1982). In the first year of its operation it traded 1,151 contracts. After surviving a difficult year in 1979 with a trading volume of only 507 contracts, its turnover reached 14,630 contracts in 1980. Although Hong Kong is a transit point to a substantial amount of cotton and presumably the contract was to serve regional interests and needs, its specification indicates that it was a substitute for the NYCE contract hence directly competing with it. For example, consider the following characteristics of the Hong Kong contract: (i) the cotton was American; (ii) the size of the contract was 50,000 pounds (equal to the NYCE contract); (iii) the delivery point was Galveston, Texas (not Hong Kong); and (iv) the contract was traded in \$US (not in \$HK). Cotton futures trading at the Hong Kong Commodity Exchange lasted four years. In 1981 the contract was delisted as the exchange shifted its emphasis from commodities to financial products — in 1995 its name also changed to Hong Kong Futures Exchange.

US: The ‘World’ Cotton Futures and Options Contract (1992-1994)

Recognizing the lack of a hedging instrument for non-US cotton, NYCE introduced a ‘world’ cotton futures and options contract in October 1992 (Lake, 1992).¹³ The contract was supposed to provide a hedging mechanism for non-US cotton producers and merchants. With a trading unit of 50,000 pounds, the contract was to be settled using a consecutive 5-day average of the Cotlook A Index.¹⁴ While in its first year of operation the trading volume reached 12,000 contracts, in the subsequent two years the contract failed to attract continuing attention. The contract was eventually delisted from the Exchange in 1994. There were several reasons for its failure: First, there was a lack of an equivalent spot market with well defined quality specifications and physical delivery location — note that the A Index is a simple average of offers, not necessarily a price at which actual transactions take place. Second, there were fears that the settlement price (i.e. the consecutive 5-day average of the Cotlook A Index) could be manipulated. Third, the contract was quoted, traded, and settled in \$US. However, non-US cotton merchants and traders who were supposed to be the main users of this contract needed to hedge their position in other currencies, hence not finding it an attractive hedging tool.¹⁵

A Synthesis

A number of important observations can be drawn from the proceeding historical review, some of which are specific to the cotton market and some to futures exchanges in general. One can divide the 140-year history of cotton futures exchanges into three sub-periods: (i) The pre-World War II period during which numerous cotton futures exchanges with high trading volume and liquidity coexisted (Alexandria, Havre, Liverpool, New York, and New Orleans); (ii) the period between the end of World War II and the 1973 commodity price boom during which there was no futures exchange trading cotton contracts at a significant scale (mainly a reflection of government policies); and (iii) the post-1973 period during which the New York Cotton Exchange has been by far the dominant (and for an extensive period of time the only) cotton futures trading center.

Cotton futures exchanges have been successful under a variety of circumstances. For example, they have been successful as self-standing operations as well as part of another exchange, some of them trading one and others trading multiple cotton contracts. They have been located in both large producing countries with domestic textiles and non-producing importing countries. They have been successful in both developed and developing countries. However, if one had to single out the most important conditions prevalent when the cotton futures exchanges were established, that would be the liberalized marketing and trade environment in cotton producing countries along with the legality of speculation which is a vital element for sufficient liquidity of the contract.¹⁶ Also, judging from the fact that apart from World War I the only time that NYCE disrupted its operations was during the Banking crisis of 1933, a well functioning banking system appears to be another important condition.

In most cases the creation of the futures exchanges preceded the legal and regulatory framework. In fact, there has been a clear pattern in the earlier cotton futures exchanges: Initially, the contracts were traded for a number of years on an informal basis. Subsequently, one or more contracts were formally introduced, typically under the aegis of a cotton traders or merchants association. Finally, many years later the regulatory authority established the rules and regulations of futures trading. On the other hand, trading of futures contracts took place simultaneously or shortly after the development of the spot market exchange, in many cases in response to the need to have an institution with well defined trading rules and specifications of the commodity in question. In fact, this reason has been cited as a third reason for the existence of futures markets — the other two are hedging and price discovery (Williams, 1986).

Of the four reasons that Hieronymus (1977) cites as causes of the demise of a commodity futures exchange, namely government prohibition, lack of demand, weak contract terms, and boycott by commercial interests, the two former appear to have been by far the ones responsible for the demise of most cotton futures exchanges. Outright government prohibition was the reason for the demise of Alexandria, Shanghai, Bombay, and Karachi Exchanges. Government intervention (and consequently lack of demand), especially the US stockholding policy by CCC, caused the demise of two US Exchanges (New Orleans and Chicago) and the ones in Europe (Bremen, Havre, and Liverpool). Lack of demand was the reason for the 'world' cotton contract's failure to take off (which in turn appears to be a likely reflection of weak contract terms). One may put the Chicago Hong Kong cotton contracts into that category as well, judging from their characteristics and low level of trading activity.

The currencies in which cotton futures were traded appears to have been an important issue. Prior to the abolition of the gold standard, currency conversions for trading and settling futures contracts was not an issue as long as there were no restrictions on capital movements. In the post-1973 period, however, hedging or speculation in cotton (or any other) futures in another currency involves exchange rate conversions at flexible (and hence unpredictable) exchange rates. Perhaps, this may have been one of the reasons that, with the exception of India (see next section), all post-1973 cotton futures contracts have been traded in \$US.

Finally, one observation on the relative merits (and credits) of the literature on this subject. It has been apparent that the world's first cotton futures exchange, the Alexandria Cotton Exchange, has not received proper credit by the literature on the subject as either being the first cotton futures exchange or at least being an important cotton futures trading center. For example, with a few notable exceptions, the early surveys on the history of cotton futures exchanges, while making extensive reference to New York and Liverpool, make little or no reference to Alexandria. Whether this is a result of omission or that Alexandria did not really play an important role in cotton futures trading deserves further investigation.

Cotton Futures Exchanges: Their Futures

The absence of a non-US hedging instrument for cotton in recent years has been well recognized. Consider, for example, what *Cotton Outlook* (December 12, 1997, p. 3) observed:

The lack of an international trading instrument other than the No. 2 contract — one which consistently reflects broad world cotton market developments but is capable of being used as 'hedge' — continues to be a shortcoming of the current pricing system.

A similar conclusion was reached more recently at the 59th ICAC Plenary Meeting in Cairns, Australia (ICAC, 2000):

... futures contracts traded in New York are limited to the delivery of U.S. cotton to U.S. locations. Accordingly prices in New York reflect primarily U.S. conditions. As a consequence, prices for cotton in non-U.S. locations can diverge from New York futures prices, limiting the utility of the New York market for many in the world industry.

This shortcoming becomes evident if one considers that on December 31, 1990, the May 1991 NYCE contract closed at 76.19 ¢, 8.21 ¢ below the A Index while it expired on May 8, 1991 at 92.22 ¢, 8.92 ¢ above the A Index, certainly implying divergence between NYCE and the A Index and hence high basis risk. This is not surprising in light of a conclusion reached recently by Baffes and Ajwad (2001b). Using an error-correction specification and weekly cotton prices (components of the A Index) from August 1985 to December 1987 and August 1995 to January 1997, they found that while there exists strong comovement among Central Asia, West Africa, and (to some extent) Greek quotes, US prices moved relatively independently of other prices, a result which was consistent in both periods. That finding further confirms the inadequacy of the NYCE contract as a hedging tool by traders and merchants of non-US types of cotton.

To fill this gap, a number of initiatives have been undertaken since the late 1990s. Brazil and India, for example, already reintroduced their cotton contracts in 1996 and 1998, respectively. When these two contracts are added to the NYCE contract along with the recently introduced cottonseed contract at the Minneapolis Grain Exchange, it makes a total of four actively traded cotton-related contracts. Moreover, Turkey, China, Euronext (the European Trading Alliance), and the US are also contemplating new initiatives (Table 5).

To put the picture into perspective, Table 6 reports the production and consumption profiles for the countries which have undertaken new initiatives. We have combined the European Union and the West & Central Africa since they are in the euro zone. In what follows, we give a brief account of the newly introduced contracts along with the new initiatives.

Brazil: The São Paulo Commodity Exchange

In November 1996 the São Paulo Commodity Exchange re-introduced the cotton contract (Guitchounts, 1997a). The new São Paulo contract, with a size of 12,750 kgs is delivered to various locations in Brazil in the months of March, May, July, October, and December. The contract is quoted and traded in \$US but is settled in Reals. The exchange rate used for settlement is the one reported by the Central Bank of Brazil. In effect, therefore, trading the São Paulo cotton contract also implies the undertaking of \$US/Real exchange rate risk. It was anticipated that the contract could serve as a hedging instrument for the South American cotton producing countries given that the region's crop (part of the Southern Hemisphere's crop) moves within a different time frame to that of the US crop (part of the Northern Hemisphere's crop), the principal influence of the NYCE contract. Initially, the volume was far below expectations as the contract failed to attract attention from hedgers and speculators. For example, in the first year of its operation, the daily trading volume averaged only 58 contracts. Recently, however, the volume of trade has increased considerably, mainly due to the increase of the domestic Brazilian production. In 2000/01, Brazil accounted for 4% of global production and 5% of global consumption of cotton.

India: The Indian Cotton Contract

Following an extensive feasibility study of commodity futures exchanges in India (World Bank, 1996), a cotton futures contract was introduced again in 1998, along with a number of other commodities. With a trading unit of 55 bales (equivalent to 9,350 kgs), the Indian Cotton Contract (ICC) is regulated by the Indian Cotton Association, Mumbai, and is traded and settled in Indian rupee. ICC's volume has been low mainly because of lack of speculative activity. In 2000/01, India produced 2.35 million tons, accounting for 12% of global output and making it the third largest cotton producer, following China and the US with 23% and 20% shares, respectively. It also imported an additional 0.5 million tons in order to fulfill the needs of its domestic textile industry.

US: The Minneapolis Grain Exchange

Following demands by the US cottonseed industry, the Minneapolis Grain Exchange (MGE) introduced cottonseed futures and options contracts on May 11, 2000, the first modern futures exchange to offer such contracts. With a trading unit of 150,000 kgs, the contract is delivered in the months of January, March, May, August, and November and the next seven contracts are available for trade (e.g. the November 2001 contract could be traded as early as August 2000). While the volume during the first few months of its operations was low, it is increasing steadily over time. The MGE is expected to be the dominant force of the pricing mechanism behind the US cottonseed industry.

Turkey: The Izmir Mercantile Exchange

Turkey is actively seeking the introduction of a cotton futures contract at the Izmir Mercantile Exchange (Gazanfer, 1992 and 1995). The Exchange, which has been traditionally the center of cotton trading activity in Turkey, was formally established in 1891. Currently, it facilitates spot transactions while occasionally trades forward contracts. The Izmir Mercantile Exchange is considering a cotton futures contract and is expected to attract business from neighboring cotton producing countries such as Egypt, Greece, and Uzbekistan (Guitchounts, 1997b). Turkey, the world's fifth largest cotton producer, has a large textile industry and occasionally imports cotton. In 2000/01 Turkey's cotton output was 750 thousand tons while it imported an additional 400 thousand tons.

China: The National Cotton Exchange

The Chinese National Cotton Exchange (located in Beijing) was established in September 1999 and facilitates spot transactions. Plans to introduce a futures contract are under way, initially to involve domestic traders only and later foreign traders. Experimental procedures and the establishment of the legal framework are being discussed. China, in addition to being the world's leading cotton producer and consumer, is the dominant stockholder, accounting for about one-third of world stocks. In 2000/01, China produced 4.35 million tons and consumed 5 million tons, 300 thousand of which came from imports and the remaining from a draw-down in stocks.

EU: Euronext (European Trading Alliance)

The European trading alliance, Euronext, recently expressed interest in launching a cotton contract.¹⁷ The contract is expected to attract interest from Africa, Central Asia, and to a lesser degree Australia, according to *The Public Ledger* (January 15, 2001). Further details, such as number and size of contracts, delivery months, whether it will be deliverable or just cash settlement, currency in which it will be traded, etc, have yet to be decided. Note that the 2000/01 combined production and consumption of West & Central Africa and European Union was 1.3 and 1.2 million tons, respectively. What is important about these two regions is the fact that the CFA franc is linked to the French franc and consequently to the euro, effectively making them a one-currency zone.

US: The Cotlook World Cotton Futures and Options Contract

In response to renewed calls for a non-US contract, NYCE has expressed interest in re-starting the 'world' cotton futures contract based on the Cotlook A Index (Barry, 2001). While a number minor amendments to the earlier 'world' contract are being discussed, the contract, if re-launched, is expected to retain the cash settlement-at-expiration feature. One of the key questions, at the moment, is whether it will be traded electronically or by open outcry.

Conclusions

For a long period of time a relatively large number of cotton futures exchanges co-existed. For example, during the 1930s, cotton futures contracts were traded at Exchanges located in Alexandria, New York, New Orleans, Liverpool, Havre, Bremen, Bombay, Chicago, Osaka, Shanghai, and São Paulo. This contradicts a common perception that only a few contracts of the same or similar products can succeed at any time. Central Asian cotton is the only type of cotton which has never been traded in futures exchanges. This is not surprising since cotton production and trade in Central Asia has always been under strict government control even before the 1917 Russian Revolution.

In the post-World War II period most futures exchanges either ceased to exist or their trading volumes were very low, hence rendering the New York Cotton Exchange by far the dominant (and for seven years, the only) cotton futures trading center. In the last five years, however, a number of initiatives have been undertaken to fill the gap. What are the prospects that one or more of the current (or maybe future) initiatives will be successful in the sense that its trading volume and liquidity will match that of NYCE or other successful futures exchanges? Considering the post-World War II history of cotton futures exchanges in isolation of other factors, such probability seems low. Against the history, however, one must consider a number of factors that are likely to influence the ultimate outcome.

First, in other primary commodity markets (coffee, cocoa, rubber, crude oil, to mention a few), futures contracts in more than one exchange have been traded successfully for many years. For example, coffee and cocoa have been traded at the New York Coffee, Cocoa, and Sugar Exchange (now part of the New York Board of Trade) in US dollars and the London International Financial Futures and Options Exchange in British pounds, and both contracts exhibit sufficient liquidity. Coffee contracts are also traded at the São Paulo and Singapore exchanges, albeit with much less liquidity.

Second, the value of world cotton production far exceeds that of coffee, cocoa, and natural rubber combined. For example, the 1996-97 value of world's cotton production (evaluated at world prices) was close to \$35 billion against \$14 billion for coffee, \$7.5 billion for natural rubber, and \$4 billion for cocoa (World Bank, 2000). Hence, in value terms, it appears that there is plenty of room for at least another major cotton futures contract.

Third, in the last decade a number of countries are in the process of undertaking or have already undertaken policy reforms in their cotton sectors (Baffes, 2001a and 2001b). For example, Uganda, Zimbabwe, and Tanzania have already gone through major policy changes while West & Central African cotton producers are contemplating reforms. Furthermore, major producers such as China are gradually replacing interventionist policies with market-oriented ones. That, in turn, is expected to make the international environment more conducive to futures trading, especially if one considers that the principal reason for the closure of most post-World War II cotton futures exchanges was government intervention by major producing countries.

Fourth, following the introduction of the euro, West and Central Africa — a large cotton producing region — along with the European Union — a large cotton consuming region — are, in effect, using one currency. Their combined production and consumption currently accounts for 7% and 6% of the world total, respectively making the euro zone an ideal place for a cotton futures exchange.

Finally, the São Paulo contract is entering its sixth year, which is an encouraging development. According to Carlton about 16% of all futures contracts die by age 1 and 40% of contracts die by age 6 while contracts which exceed the age of 6 "... can expect to remain around for a good while" (p. 251). It is difficult to assess the probability that at least one of the new initiatives will be successful. However, if one excludes the post-World War II history, the factors mentioned above (i.e., experience from other commodity markets, size of the cotton market relative to other commodities, recent policy reform initiatives, the creation of the euro zone, and the longevity of the São Paulo contract) are reasons for cautious optimism.

References

Abdel-Fadil, Mahmoud (1975). *Development, Income Distribution and Social Change in Rural Egypt — 1952-1970: A Study in the Political Economy of Agrarian Transition*. Cambridge: Cambridge University Press.

Baer, Julius Bernard and Olin Glenn Saxon (1949). *Commodity Exchanges and Futures Trading: Principles and Operating Methods*. US: Harper & Brothers.

Baffes, John (2001a). "Policy Reform Experience in Cotton Markets." In *Commodity Market Reforms: Lessons of Two Decades*, ed. Takamasa Akiyama, John Baffes, Donald Larson, and Panos Varangis. Washington, DC: World Bank Regional and Sectoral Studies.

Baffes, John and Mohamed Ihsan Ajwad (2001b). "Identifying Price Linkages: A Review of the Literature and an Application to the World Market of Cotton." *Applied Economics*, vol. 33, pp. 1927-1941.

Baffes, John (2000b). "Cotton Reforms in West and Central Africa, and the World Bank." *Cotton Outlook Special Feature: Cotton in the Franc Zone*, pp. 32-38. Cotlook Limited: Liverpool, UK.

Barry, Tim (2001). "The Development of a World Cotton Futures Contract." Presentation made at the 452nd Meeting of the Standing Committee, International Cotton Advisory Committee, Washington, DC, March 13.

Berger, Josef (1969). *The World's Major Fibre Crops: Their Cultivation and Manuring*. Zurich: Centre d' Etude de l'Azote.

Black Fischer and Myron S. Scholes (1973). "The Pricing of Options and Liabilities." *Journal of Political Economy*, vol. 81, no. 3, pp. 637-654.

BMSP (1987). *Bolsa de Mercadorias de São Paulo: 1917-1987*. São Paulo, Brazil: Laserprint Editorial.

Boyle, James E. (1935). *Cotton and the New Orleans Cotton Exchange: A Century of Commercial Evolution*. New York: Doubleday, Doran and Company, Inc.

Brand, Simon S. (1964). "The Decline in the Cotton Futures Market." *Food Research Institute Studies*, vol. 4, pp. 305-315.

Bremen Baumwollbörse (1997). *A Cotton Era: 125 Years Bremen Cotton Exchange*. Bremen, Germany: H. M. Hauschild GmbH.

Bremen Baumwollbörse (1972). *Annual Report*. Bremen, Germany.

Carlton, Dennis W. (1984). "Futures Markets: Their Purpose, Their History, Their Growth, Their Successes and Failures." *The Journal of Futures Markets*, vol. 4, pp. 237-271.

Cotton Outlook. *Cotlook Limited*, Liverpool, UK. Various issues.

Courtney, David (1991). *From Forum to Futures: A Chronicle of 2,000 Years of Britain's Commodity Markets*. London: The Bath Press.

- Cox, Alonzo Bettis (1925). "Evolution of Cotton Marketing: A Special Report." Bureau of Agricultural Economics, United States Department of Agriculture, Washington, DC, December.
- Donnell, Ezekial J. (1872). *Chronological and Statistical History of Cotton*. New York: J. Sutton & Co.
- Dow, J. Christopher R. (1941). "The Inaccuracy of Expectations: A Statistical Study of the Liverpool Cotton Futures Market." *Economica*, vol. 8, pp. 162-175.
- Dumbell, Stanley (1923). "Early Liverpool Cotton Imports and the Organization of the Cotton Markets in the Eighteenth Century." *Economic Journal*, vol. 33, pp. 363-373.
- Dumbell, Stanley (1927). "The Origin of Cotton Futures." *Economic Journal*, [vol. 37, no. 145], pp. 259-267.
- Ellison, Thomas (1886). *The Cotton Trade of Great Britain Including a History of the Liverpool Cotton Market and of the Liverpool Cotton Brokers' Association*. London: Effingham Wilson, Royal Exchange.
- Emery, Walter L. (1975). "Understanding the Cotton Futures Market." In *Forecasting Commodity Prices: How the Experts Analyze the Markets*, ed. H. Jiler. New York: Commodity Research Bureau, Inc.
- Evans, James M. and Joan M. Mahoney (1997). "The Effects of Price Limits on Trading Volume: A Study of the Cotton Futures Market." *Current Issues in Economics and Finance*, Federal Reserve Bank of New York. Vol. 3, no. 3, January.
- Farooqui, Hameed M., Clyde R. Keaton, and Guy W. Miller (1958). *Agricultural Marketing in Pakistan*. Karachi: Amin Book Co.
- Garside, Alston Hill (1935). *Cotton Goes to the Market*. New York: Frederick A. Stokes Company.
- Gazanfer, Sebahattin (1992). "Assessing the Establishment of a Cotton Futures Market in Turkey." Paper Prepared for the *Technical Seminar of the ICAC 51st Plenary Meeting*. Liverpool, UK, September 28 — October 2.
- Gazanfer, Sebahattin (1995). *Guidelines for Facilitating Access to Risk Management Markets through the Stimulation of Local and Regional Exchanges: The Case of Cotton in the Near East/CIS/Pakistan*. United Nations Conference on Trade and Development. Report UNCTAD/COM/65, September 15.
- Guitchounts, Andrei (1997a). "Traders Assessing São Paulo Contract." *Cotton: Review of the World Situation*, International Cotton Advisory Committee. Vol. 50, no.3, January-February, pp. 5-6.
- Guitchounts, Andrei (1997b). "BM&F Cotton Futures Volume Remains Small." *Cotton: Review of the World Situation*, International Cotton Advisory Committee. Vol. 51, no. 2, November-December, pp. 12-14.
- Hafez, Abdel-Rahman M. (1946). *The Alexandria Cotton Market*. Cairo: Fuad University Press.
- Hansen, Bent and Girgis A. Marzouk (1965). *Development and Economic Policy in UAR (Egypt)*. Amsterdam: North-Holland Publishing Company.
- Hieronimus, Thomas A. (1977). *Economics of Futures Trading for Commercial and Personal Profit*. New York: Commodity Research Bureau.
- Huque, Heshamul (1987). *Cotton Production in Pakistan: A Story of Success*. Karachi: Pakistan Central Cotton Committee.
- Hyde, Francis E., Bradbury B. Parkinson, and Sheila Marriner (1955). "The Cotton Broker and the Rise of the Liverpool Cotton Market." *The Economic History Review*, vol. 7, no. 1, pp. 75-83.
- Hugill, Peter J. (1999). *Global Communications Since 1844: Geopolitics and Technology*. Baltimore, US: The Johns Hopkins University Press.
- ICAC, International Cotton Advisory Committee (2000). "Private Sector Advisory Panel: Report to the 59th Plenary Meeting." November 7, Cairns, Australia.

Irwin, Harold S. (1954). *Evolution of Futures Trading*. Madison, Wisconsin: Mimir Publishers, Inc.

Lake, Ted (1992). "A World Cotton Futures Contract." *Cotton: Review of the World Situation*, International Cotton Advisory Committee. Vol. 45, no. 5, May-June, pp. 14-15.

Lal, M. B. and K. S. Parmar (1995). *Cotton Marketing*. Bombay: Tecoya Disseminators.

Markham, Jerry W. (1987). *The History of Commodity Futures Trading and its Regulation*. New York: Praeger Publishers.

Merton, Robert C. (1973). "The Theory of Rational Option Pricing." *Bell Journal of Economics*, vol. 4, no. 1, pp. 141-183.

Parry, John (1982). *Guide to World's Commodity Markets*. London: Kogan Page.

Pavaskar, Madhoo G. (1971). *Marketing of Cash Crops: Efficiency of Futures Trading*. Bombay: Krishna Raj.

Pavaskar, Madhoo G. (1969). "Why Does Organized Industry Assail Futures Markets?" *Economic and Political Weekly*, Vol. IV, No. 52, December 27.

Rees, Graham L. (1972). *Britain's Commodity Markets*. London: Paul Elek Books.

The Public Ledger (2001). "Euronext Considers Launching Cotton Contract." January 15, p. 12.

UNCTAD, United Nations Conference on Trade and Development (1998). *A Survey of Commodity Risk Management Instruments*. UNCTAD/COM/15/Rev. 2, April 6. www.unctad.org/en/docs/pocomd15r2.en.pdf.

White, George Savage (1836). *Memoir of Samuel Slater*. Philadelphia.

Williams, Jeffrey (1986). *The Economic Function of Futures Markets*. Cambridge, Massachusetts: Cambridge University Press.

Williams, Jeffrey (1982). "The Origins of Futures Markets." *Agricultural History*, vol. 56, pp. 306-316.

World Bank (2000). *Global Commodity Markets*. Washington, DC, April.

World Bank (1996). *India – Managing Price Risks in India's Liberalized Agriculture: Can Futures Markets Help?* Report No. 15453-IN, Country Department II, South Asia Region, World Bank and Commodity Division, United Nations Conference on Trade and Development.

Yamey, Basil S. (1959). "Cotton Futures Trading in Liverpool." *Three Banks Review*, pp. 21-38.

Table 1. World Cotton Supply: 1790-1830

	1790	1800	1810	1820	1830	1790	1800	1810	1820	1830
	----- Thousand Tons -----					----- % of world total -----				
US	1	22	36	80	175	0	9	14	29	47
India	59	73	77	79	82	28	30	31	28	22
Other Asia	86	73	66	61	52	40	30	26	21	14
Africa	21	20	20	21	24	10	8	8	7	7
Brazil	10	16	16	15	17	5	7	6	5	5
Other LAC	36	30	31	24	20	17	12	12	9	5
Others	0	7	5	4	2	0	3	2	1	0
World	213	240	252	286	372	100	100	100	100	100

Source: White (1836), reproduced in Cox (1925).

Notes: Africa includes Egypt; Other LAC refers to Latin America countries including West Indies but excluding Brazil. Years refer to crop years, e.g., 1790 refers to the crop year 1790/91.

Table 2. Cotton Consumption by Major Players: 1800-1880

	1800	1810	1820	1830	1840	1850	1860	1870	1880
----- Thousand Tons -----									
UK	22	44	58	160	210	302	474	547	648
Continent	14	18	34	76	125	174	313	356	536
US	5	8	14	33	54	74	183	202	384
Total	41	71	107	269	389	549	970	1,105	1,568
----- % of total -----									
UK	53	63	55	60	54	55	49	49	41
Continent	33	26	32	28	32	32	32	32	34
US	13	12	13	12	14	13	19	18	24
Total	100	100	100	100	100	100	100	100	100

Source: Donnell (1872) and Ellison (1886, p. 98 and p. 102).

Notes: Continent refers to Continental Europe. Total refers to the sum of the three consuming regions reported, not to the world total. Years refer to crop years.

Table 3. Cotton Imports to Europe: 1860-1880

	1860	1865	1870	1875	1880	1860	1865	1870	1875	1880
----- Thousand Tons -----										
US	736	95	425	565	820	84	18	56	57	72
Brazil	9	27	39	39	14	1	5	5	4	1
Egypt	24	100	69	100	106	3	19	9	10	9
Turkey	4	43	25	16	4	0	8	3	2	0
W. Indies	4	15	14	13	6	0	3	2	1	1
India	100	223	192	258	195	11	43	25	26	17
Total	878	519	764	990	1,145	100	100	100	100	100
----- % of world total -----										

Source: Ellison (1886, p. 91).

Notes: The large drop of imports from the US in 1865 is due to the American Civil War. In 1865 there was a small amount of imports from China.

Table 4. Cotton Futures Contracts Traded During 19th and 20th Centuries

Country	Exchange	Period
Egypt	Alexandria Cotton Exchange	1861-1961
US	New York Cotton Exchange	1870-
US	New Orleans Cotton Exchange	1880-1964
UK	Liverpool Cotton Exchange	1882-1964
France	Havre Futures Market	1882-1965
Japan	Osaka Sampin Exchange	1910-1941
China	Shanghai Cotton Exchange	1911-1941
Germany	Bremen Cotton Exchange	1914-1971
Brazil	São Paulo Commodity Exchange	1919-1989
India	Bombay Cotton Exchange	1922-1966
US	Chicago Board of Trade	1924-1964
Pakistan	Karachi Cotton Exchange	1955-1971
UK	London Commodity Exchange	1969-1975
Hong Kong	Hong Kong Commodity Exchange	1977-1981
US	New York Cotton Exchange, 'World' Contract	1992-1994

Source: Compiled by the authors.

Table 5. Cotton Futures Contracts: Recent and New Initiatives

Country	Exchange	www	Active since
Brazil	São Paulo Commodity Exchange	www.bmf.com.br	1996
India	Indian Cotton Contract	www.ecottonindia.com	1998
US	Minneapolis Grain Exchange	www.mgex.com	2000
China	National Cotton Exchange	www.chinacotton.org	New initiative
Turkey	Izmir Mercantile Exchange	www.itb.org.tr	New initiative
EU	Euronext	www.euronext.com	New initiative
US	New York Cotton Exchange	www.nybot.com	New initiative

Source: Compiled by the authors.

Notes: The Minneapolis Grain Exchange trades a cottonseed contract. Euronext refers to the European Trading Alliance (i.e. the merger of the Amsterdam Exchange, the Brussels Exchange, and the Paris Bourse.)

Table 6. Cotton Production and Consumption Profiles of Countries With New Initiatives: 1970-2000

	1970	1980	1990	2000	1970	1980	1990	2000
	----- Thousand tons -----				----- % of world total -----			
PRODUCTION								
China	1,995	2,707	4,508	4,350	17	20	24	23
US	2,219	2,422	3,376	3,824	19	18	18	20
India	909	1,322	1,989	2,350	8	10	10	2
EU/WCA	250	419	853	1,241	2	3	4	7
Brazil	549	623	717	850	5	5	4	4
Turkey	400	500	655	750	3	4	3	4
World	11,740	13,832	18,970	18,969	100	100	100	100
CONSUMPTION								
China	2,016	3,300	4,225	5,000	17	23	23	25
India	1,076	1,371	1,958	2,875	9	10	11	14
US	1,786	1,283	1,885	2,000	15	9	10	10
EU/WCA	1,291	1,144	1,311	1,173	11	8	7	6
Turkey	184	293	557	1,150	2	2	3	6
Brazil	296	566	723	910	2	4	4	5
World	12,173	14,215	18,576	19,831	100	100	100	100

Source: International Cotton Advisory Committee.

Notes: The figures refer to crop year (August/July). EU/WCA denotes the combined total of the European Union and West & Central Africa.

¹ The remainder of this section is based on Ellison (1886), and Donnell (1872)..

² Donnell (1872) for example, writes (p.17): “Cotton seeds were first planted as an experiment in 1621, and their plentiful coming up was, at that early day, a subject of interest in America and England.”

³ A number of other cotton-related inventions took place towards the end of the 18th century. For example, Cox (1925) who calls the years between 1760 and 1800 the “period of invention” wrote (p. 8): “Hargreaves’ spinning jenny invented in 1764, Arkwright’s spinning-frame (1769), Crompton’s spinning mule (1779), Cartwright’s power loom (1785), and the harnessing of Watt’s steam engine to spinning and weaving machinery (1792) revolutionized the uses of raw cotton, lowered the price of the finished goods, and increased the demand enormously.”

⁴ Options contracts became popular during the 1970s, following the seminal work of Black and Scholes (1973) and Merton (1973) on option pricing – the Black-Scholes option pricing formula. The difficulty on pricing options stems from the fact in order to determine its fair value (i.e. the ‘insurance fee’), one must estimate not only the price likely to prevail in the future but also the likelihood that the price will take any other value, which in turn requires full knowledge of the entire probability distribution.

⁵ A comprehensive survey of commodity risk management instruments can be found in UNCTAD (1998).

⁶ In June 1998, the New York Cotton Exchange merged with the Coffee, Cocoa, and Sugar Exchange (CSCE) to form the Board of Trade of the City of New York (NYBOT). Throughout the remainder of the paper, however, we retain its original acronym, NYCE.

⁷ A cottonseed oil contract was also traded at the New York Produce Exchange, which was established in 1870 and disappeared in the 1960s (Baer and Saxon, 1949).

⁸ There had been two previous unsuccessful attempts to connect the Atlantic with telegraph cable: the 1857 cable — a complete failure — and the 1958 cable which transmitted messages for only three months (Hugill, 1999). The 1865 cable and the two that followed in 1866 and 1869 lasted for 12, 6, and 25 years respectively. The role of the telegraph in boosting trading activity was also important in New York. Williams (1982, p. 312), for example, wrote: “Although the western ports did not get a telegraph until 1848, Buffalo and New York were connected in late 1846. Perhaps then, the flurry of trading in 1847 accompanied the introduction of the telegraph.” Cox (1925) reports that the first “in transit” contracts were traded in New York in 1856. A detailed account of the evolution of time contracts at Chicago and New York can be found in Irwin (1954).

⁹ The Liverpool Cotton Brokers Association, which was formed in 1841, is considered the first organized body of cotton traders. According to Hyde, Parkinson, and Marriner (1955), the association played a crucial role in the early development of the Liverpool cotton market.

¹⁰ It is due to these developments that the Liverpool Cotton Exchange has been credited for being the first exchange which established the rules for futures trading later adapted by others, including the Chicago Board of Trade (Courtney, 1991).

¹¹ The Havre Futures Market was initially operated by French-speaking traders and merchants trained at the New Orleans Cotton Exchange. This primarily reflected the close ties between France and its former colony Louisiana.

¹² Cotton exports from Egypt and Sudan increased considerably as a result of the American Civil War (Berger, 1969).

¹³ During the late-1980s, the London Commodity Exchange (LCE) had reportedly expressed interest in launching a contract based on the A Index. It is believed that NYCE’s ‘world’ contract was a pre-emptive move against LCE’s interest.

¹⁴ The A Index is the most widely quoted price for cotton. It is calculated as an average of the five least expensive of 14 styles of cotton traded in northern Europe. The index is constructed daily by Cotlook Limited, a private information dissemination company based in Liverpool, UK — the most important cotton trading center in Europe during the 18th and 19th centuries — and published in the weekly magazine *Cotton Outlook*.

¹⁵ Although the ‘world’ cotton contract was launched by NYCE, we consider it a separate entity because its characteristics were different from those of the No. 2 contract.

¹⁶ Not all policy interventions are inconsistent with futures trading. For example, interventions such as direct income support schemes are not impediments to futures trading.

¹⁷ Euronext was established on September 22, 2000 as a merger of the Amsterdam Exchange, the Brussels Exchange, and the Paris Bourse.