



Managing Cotton Price Risk in Egypt

Omneia Helmy

Working Paper No. 64

November 2001

Omneia Helmy is Associate Professor at the Faculty of Economics and Political Science, Cairo University. The views expressed in this paper are those of the author and not necessarily of Cairo University or the Egyptian Center for Economic Studies.

Abstract

This paper discusses alternative policy options for dealing with the large variability in world cotton prices. It also evaluates the current price guarantee scheme in Egypt in terms of its impact on farmers, traders, the treasury and the economy at large. It concludes that Egypt is better off at this stage continuing with and reforming the current system. Shifting to direct income support programs or market-based hedging solutions requires sophisticated markets and institutional setup, which do not currently exist. However, to make the current system more efficient, the study suggests the creation of a single, independent organization to deal with all aspects of the cotton sector. It also recommends linking seed cotton guarantee prices to world cotton prices to minimize overproduction at times of low world demand. As for marketing, the paper suggests that the allocation of rings be based on explicit and competitive criteria, as well as the gradual privatization of the public sector cotton trading companies.

ملخص

تناقش هذه الورقة السياسات البديلة لمواجهة مخاطر التقلبات السعرية في السوق العالمية للقطن. كما تقدم تقييماً لسياسة ضمان حد أدنى للأسعار وهي السياسة المتبعة حالياً في مصر، وذلك من حيث أثرها على المزارعين والتجار والخزانة العامة والاقتصاد ككل. وتخلص هذه الدراسة إلى أن الظروف الاقتصادية الحالية تقتضي الإبقاء على النظام الحالي مع العمل على إصلاحه. ويرجع ذلك إلى عدم توافر الإطار المؤسسي وأدوات السوق الضرورية لتطبيق كل من نظام الدعم المباشر لدخول المزارعين واستخدام المشتقات المالية السلعية. ولتفعيل النظام الحالي ترى الدراسة ضرورة إيجاد جهة واحدة مستقلة للتعامل مع جميع أوجه قطاع القطن، كما ترى أهمية ربط أسعار الضمان بأسعار القطن العالمية بغية الحد من الإفراط في الإنتاج عند انخفاض الأسعار العالمية. أما بالنسبة للتسويق، فتؤكد الدراسة على ضرورة تخصيص حلقات تسويق القطن وفقاً لمعايير واضحة تتسم بالتنافسية، إلى جانب أهمية التفكير في الخصخصة التدريجية لشركات تجارة القطن التابعة للقطاع العام.

I. Introduction

Volatility in world cotton prices is an important policy issue for Egypt, as cotton is a key export commodity that affects many agents and activities.⁽¹⁾ There are three main approaches to managing price risk of commodities in general and cotton in particular: domestic price stabilization schemes, direct income support programs, and the use of commodity risk management tools. These approaches differ in their mechanisms and economic implications.

To cope with the problem of volatility in world cotton prices, the Egyptian government follows the domestic price stabilization approach. The government protects cotton growers from revenue variability by guaranteeing them a support price. Notwithstanding the merits of the government's pricing policy, it has had various adverse effects on cotton growers, private traders, and the government's finance. Thus, the aim of this paper is to address two main questions:

- How could the current cotton pricing policy be better administered in Egypt?
- Could the other two approaches: the direct income support programs, and the use of commodity risk management tools, be more effective alternatives to managing cotton price risk in Egypt? And under what conditions?

Section II is an assessment of the effectiveness of the three approaches to managing commodity price risk. In section III, the benefits and costs of Egypt's cotton pricing policy are analyzed. In section IV, reforms to improve the current cotton pricing policy will be proposed and more effective approaches to managing cotton price risk will be suggested for Egypt, and their necessary institutional setup will be identified. Section V concludes.

II. Managing Commodity Price Risk: Country Experiences

Concerns about commodity price fluctuations have led to commodity policy interventions by national governments. A review of country experiences reveals that managing price risk of commodities in general and cotton in particular, follows three main approaches: domestic price stabilization schemes, direct income support programs, and the use of commodity risk management tools. This part provides an analysis of the mechanisms and economic implications of each approach. It will enable us to determine the most suitable approach to

managing cotton price risk in Egypt, and its necessary economic conditions and institutional setup.

Domestic Price Stabilization Schemes

In order to protect the interests of producers from world commodity price fluctuations, many governments attempt to stabilize domestic producer prices. Domestic price stabilization schemes have been adopted in developed countries, like the United States and the European Union, as well as in developing countries, such as China [Mainland], Turkey, Brazil, and Papua New Guinea (Becerra, 2000; Gasanfer 1999; and Gilbert, 1993).

Mechanisms

Domestic producer price stabilization is often achieved through buffer fund (stabilization fund) schemes, or by the creation of marketing boards. The latter arrangement is more common (Gilbert, 1996, 1993, and 1987; and Gemmill, 1985).

A stabilization fund sets a domestic threshold price for the commodity. The fund accumulates revenues collected as levies when the world commodity price is higher than the threshold price, and disburses the revenues accumulated as subsidies to producers when this price falls below the domestic threshold price (example, Papua New Guinea cocoa stabilization buffer fund). The operation of this sort of schemes requires an accurate estimate of the long-run world price, and an effective mechanism for ensuring tax payments.

Many governments stabilize producer prices by setting up marketing boards to act as monopsony buyers. The marketing board fixes an official buying price, or offers a guaranteed floor price to farmers, that are announced before planting or sowing. The price is maintained for a specified period (typically around six months) during which the board guarantees to buy whatever is offered (Gillham, et.al., 1995; Gilbert, 1993; and Fleisher, 1990).

The United States deficiency payments system for upland cotton aimed at supporting farmers' incomes; and providing a more stable economic environment for cotton growers. The U.S. government operated a floor price system for cotton producers in the form of a target price, which was set in 1990 for the five marketing years 1991/92 to 1995/96 at 72.9 cents per pound. Farmers sell their cotton after harvest on the market and receive the market price (which is the world market price) plus the difference between the target price and the calendar year average farm price. If the market price falls under a certain level, farmers can

place the cotton in storage after harvest and receive a loan rate from the Commodity Credit Corporation (CCC) as well as, once again, the difference between this loan rate and the target price. The loans are limited to nine months. Farmers can repay the loans plus interest and storage charges and sell the cotton on the market if market prices rise during that period. If cotton world market prices are below the loan rate during a longer period, the government can reduce the loan rate by 30 percent, thereby creating incentives for farmers to sell the cotton on the market instead of storing it. To obtain deficiency payments, farmers are required to idle a certain fraction (10-25 percent) of their land (Koester, and Brunner, 1997).

In China (Mainland), the government determines the level of prices, imports and exports of cotton. Regardless of demand and supply conditions, government organizations known as Cotton and Jute Companies must buy the entire cotton crop at a national procurement price established by the government. Procurement prices do not reflect the cost of ginning, packaging, storage and transportation of cotton, which is estimated at 20 percent of the procurement price. By setting procurement prices above international prices, the government of China provides assistance to growers through a system comparable to a price support program. However, there have been recent reforms to the cotton price and distribution systems. As of September 1, 1999, new policies in China have allowed domestic cotton prices to be influenced by market factors. The government still sets a reference price for cotton. Nonetheless, actual prices are now negotiated between buyers and sellers and can go below the reference price. For 1999/2000, the government has set the reference price at 22 percent lower than the procurement price for 1998/99 and 30 percent lower than in 1997/98. The government of China is seeking to reduce large stocks of cotton and plans to broaden marketing channels by allowing state mills to procure cotton directly from farmers (Becerra, 2000, and Gasanfer 1999).

Implications

Domestic price stabilization schemes are attractive to producers because they stabilize market prices for a given production cycle, and reduce interyear price variation. Thus, they assure producers that long-term investment in machinery, irrigation equipment, land, and improvements will eventually pay off (Koester, and Brunner, 1997; Fleisher, 1990; and Wong, 1990).

However, many countries that once relied on domestic price stabilization schemes, have been abandoning them, because of the problems associated with these schemes. Domestic price stabilization schemes were found to be costly and unsustainable. Commodity prices tend to have persistent and large swings and a significant element of uncertainty. Therefore, governments usually needed large and uncertain amount of funds for an uncertain period of time. These stabilization schemes tied up scarce resources that could be better used in other sectors of the economy (Faruqee, Coleman, and Scott, 1997; Fleisher, 1990).

Stabilization schemes were difficult to implement, and often required huge bureaucracies. For instance, the U.S. deficiency payment system needed a high degree of information to set the five-year target price, the loan rate and the acreage reduction level. Under this scheme, farmers had incentives to idle less of the land that they were required to idle, to increase their profits. The government found it necessary to introduce controls, which resulted in an enlargement of costs (Koester, and Brunner, 1997; and Knudsen and Nash, 1990).

Also, for a stabilization scheme to be viable, commodity prices should revert eventually to their mean. Although this happens to most commodity prices, yet empirical work has shown that it occurs very slowly, with an average reversal time measured in years, not months. For instance, cotton price shocks are typically very long-lived (the medium duration is 152 months) (Dehn, 2000a and b; and Cashin, Liang, and McDermott, 1999).

Domestic price stabilization policies did not remove price risk from the economy as a whole but merely transferred the risk within the economy. These policies transferred the risk from market participants in the form of unstable prices to the government (and ultimately to taxpayers) in the form of unstable subsidy payments. Overall, the government was the entity most exposed to price variability. In effect, the government crowded out private sector risk management, and farmers and private traders had little incentive to manage risk on their own behalf. They had little need to worry about fluctuating prices when making production and investment decisions (Faruqee, Coleman, and Scott, 1997).

Producers who were insulated from the market through a government stabilization scheme failed to react to market signals. They tended to overproduce in periods of low international prices when domestic prices were artificially raised. This overproduction resulted in large carryover of stocks (Fleisher, 1990).

Finally, a negative consequence that resulted from the operation of a board scheme was that by offering a fixed or a guarantee price, the board suppressed intergrade variability. This encouraged producers to deliver the grade that was the least costly to produce, and this was generally of low quality (Gilbert, 1993).

Direct Income Support Programs

Direct income support programs were introduced in the European Union in 1993, Mexico in 1994, and the United States in 1996, to compensate producers for the reduction or elimination of guarantee prices on support crops, by replacing price support by a lump-sum transfer. All these programs are similar in their explicit goal of delinking income support from current production decisions and in moving toward market-driven prices.

Theoretically, these programs are supposed to promote allocative efficiency in that quantity produced and price received are –in varying degrees- made independent of the amount of support, encouraging resources to be used as relative prices and comparative advantage dictate (Baffes and Meerman, 1997).

Mechanisms

In 1993, the European Union (EU) reformed a significant part of the Common Agricultural Policy (CAP). The EU reduced support prices and began to compensate producers by annual direct payments based on their past acreage in the previously supported crops. Payments are fixed in nominal terms with no upper limit and no expiration date. Producers should allocate land to support crops and must set aside a predetermined level of support-crops land.

Mexico's new farm support program "PROCAMPO" (Programa Nacional de Modernización del Campo), based payments on average acreage in support crops during the previous period, 1991-93. PROCAMPO will be phased out in fifteen years, and world prices will then prevail in the agricultural sector. Payments are fixed in real terms during the first ten years, and will be declining in final five years. Payments are limited by US\$ 6,700 per farm. Land should be allocated to support-crops. However, since 1996, this requirement became less restrictive as the Mexican government has increased the number of eligible crops.

The U.S. Federal Agricultural Improvement and Reform (FAIR) law, removed the link between income support payments and farm prices by providing "production flexibility contract payments" for a number of crops. Participant producers receive these payments as

a function of the amount of land registered for government support payments in any of the past five years, historical yields and budgetary allocation. Hence, the payments are independent of current production decisions. Payments are limited by US\$ 40,000 per farm. The payments are fixed annually at a declining rate and the program lapses after seven years. The question of support after this period is left wide open. Annual acreage idling required as part of the previous support programs has been eliminated and producers are now free to plant any crops on the former “contract acres” except fruits and vegetables (Schiff and Valdes, 1998; Baffes, and Meerman, 1997; and McCaw, 1996).

Implications

Direct income support schemes motivate farmers to produce crops with the highest market value, and share the risk with government. At the same time, they do not eliminate government support to farmers against dramatic price volatility. However, country experiences reveal that moving from price-based subsidization toward direct income-support compensation raises some important issues. It is difficult to determine producers eligible for income support, and to ensure fair and equitable distribution of producer payments. Direct income-support programs require a large amount of funds, and strong supporting institutions (Baffes, and Meerman, 1997).

A national land registry that determines eligible producers and the amount of land covered by the program should exist before the announcement of the program to ensure fair and timely production payments. Land-tenure rights are needed in order to determine who is entitled to the payment. If a tenant has operated a land for the entire period on which the payments are based, and support is based on land previously allocated to supported crops, the landowner will claim the payments and the tenant claims the payments. A survey of the rural economy in order to identify the distribution of owner/non-owner operated farms, is required.

The amount of support in the new income programs depends on land used for past agricultural production. Thus, large farmers receive most of the support. In many developing countries, this is normally a less appropriate criterion, since land is not equally distributed, and most farmers own little or even no land whatsoever. Attempting to overcome this problem, Mexico has imposed a ceiling of 100 hectares on the amount of land that any single farmer can use to justify payments. This limit in terms of maximum

hectares eligible for income support is an equitable device for containing fiscal costs and reducing support to larger producers.

Concerning the government's finance, the fiscal costs of direct income support programs proved to be problematic. The Mexican and the American programs have been more costly than the programs they replaced, evaluated at prices prevailing at the time of their implementation. In the U.S. the cost of the program in 1996-97 was about US\$ 5.5 billion, as opposed to US\$ 4.2 billion spent in 1994-95 for deficiency payments. In Mexico, the introduction of PROCAMPO almost doubled the transfers to the agricultural sector, from N\$ 6.4 billion in 1993 to N\$ 11.7 billion in 1994 (Baffes, and Meerman, 1997).

Furthermore, the fiscal costs of the programs are independent of world prices, so if the programs start out expensive, they will always remain high. Also, if world prices are high, producers not only receive these high prices, but the program also finances them. This results in excess burden on taxpayers, who as consumers pay high prices and as taxpayers bear the program's costs.

Restrictions on land use reduce allocative efficiency, and the enforcement of these restrictions in developing countries such as Mexico entails relatively expensive, administrative measures. Monitoring compliance with cultivation restrictions is very complicated especially in areas where the average farm size is small. Moreover, monitoring such restrictions may lead to discretionary behavior.

Weak supporting institutions are more likely to be a problem in developing countries. In Mexico, PROCAMPO was announced before the existence of a national land registry. This wrong sequence has caused moral hazard as many farmers reacted by increasing the amount of land in production of the eligible commodities so as to increase future-program payments. Thus, rather than moving resources to more efficient uses, the scheme, temporarily at least, moved resources into production that was already excessive.

Commodity Risk Management Tools

Some developing countries like Argentina, Mexico, Guatemala, Kenya, South Africa, Korea, China, and Indonesia, have witnessed a significant growth in the use of market-based risk management techniques, including the use of commodity futures, options and swaps. A few developing country governments use commodity derivatives to provide price protection to farmers. Examples include the provision of options to coffee growers in

Guatemala, and cotton farmers in Mexico (World Bank, 1999; Larson and Varangis and Yabuki, 1998).

Commodity derivatives can mitigate the short-term effects of adverse price movements and help governments and the private sector to gradually adjust to new trends in commodity prices. Commodity derivatives provide mechanisms to shift the risks from entities in developing countries that are unable or unwilling to bear these risks to those who are more able, or willing to bear them in established international commodity exchanges.

Mechanisms

Trading in forward, futures and options markets occurs when participants can find commodity price information for a future date and lock in on these prices for future delivery. Commodity derivatives include standardized instruments used in established commodity exchanges (futures and options) and over-the-counter (OTC) alternatives (forward contracts, OTC options, etc.). Table (1) lists the advantages and disadvantages of OTC and standardized contracts (UNCTAD, 1998; Glen, 1997).

In Mexico, the government began to offer farmers and their associations the opportunity to purchase insurance against a drop in prices below a certain level, through put options.⁽²⁾ The Mexican Agricultural Products Options Program (APOP) was created in 1994, and covers cotton, corn, sorghum, soybeans, and wheat. The Secretary of Agriculture, Livestock and Rural Development developed the APOP in coordination with the Support Services for Agricultural Marketing Agency (ASERCA)- a decentralized administrative body providing commercial support to farmers (Larson, Varangis, and Yabuki, 1998; and Larson and Coleman, 1993).

The APOP provides two alternatives to producers. Under the simple coverage, ASERCA pays part (50 percent) of the option premium cost. Under the funded coverage (FINCA), ASERCA may contribute a large part (75 percent) of the premium cost, but in exchange producers deposit a like amount in a "FINCA" fund for at least three years. The purpose of the fund is to encourage savings and investment among farmers. In 1997, over 16,000 producers participated in the APOP, and 90 percent of them selected the simple coverage.

Table 1. Advantages and Disadvantages of OTC and Standardized Contracts

	OTC Contracts (e.g. forward)	Standardized Contracts (e.g. futures)
Main characteristics:	Contracts are directly negotiated between two parties and are customized for the specific needs of the parties.	Contracts are standardized in terms of maturity, commodity, size, prices and contract-terms and traded in organized exchanges. Markets close daily (futures).
Advantages:	<ul style="list-style-type: none"> *Basis risk tends to be small because contracts are customized to meet the specific needs of the users ^(a). *No initial capital is required to participate in the market. *No margin calls (collateral) are required. *Reduce the administrative burden of executing transactions for the final user. *Contract terms are negotiable so that they could be longer than those of standardized contracts. 	<ul style="list-style-type: none"> *Contract can be transferred to another person. Contracts are fungible. *Prices are fairly transparent. *Regulations of Exchanges apply to all transactions. Therefore, transactions are monitored and guaranteed by an Exchange (No counterparty risks) ^(b). *No negotiation is necessary to participate in the market so that anybody can participate with initial deposit.
Disadvantages:	<ul style="list-style-type: none"> *Contract cannot be reversed or transferred to another person. *Prices tend to be less transparent because they are negotiated between two parties. *Transactions are not monitored so that counterparty risks remain. 	<ul style="list-style-type: none"> *Because this is a standardized contract, basis risk remains. *Market participants are required to pay an initial deposit when they buy/sell contracts. *Market participants are required to pay margin calls when prices move against them ^(c). *Contract terms are short (usually up to 18 months but liquidity of agricultural commodities tends to concentrate within 9-12 months).

(a) **Basis risk** is the lack of correlation of local to international prices. For example, it is the unforeseen difference between the futures price in the US and the spot market price in Egypt. Basis risk arises when the design of standardized contracts traded in the international markets is too generalized and does not reflect local needs. (b) **Counterparty risk** is failure to meet obligation by either trading partner. © **Margin call** is a request from a broker to a customer for additional money or collateral to cover the customer's futures position after a price change unfavorable to the customer. The broker may close out the customer's position if the margin call is not met. Source: (UNCTAD, 1998 and 1996; Glen, 1997; Morgan, Rayner and Ennew, 1994; and McKinnon, 1967).

ASERCA functions like an intermediary and an facilitator between the producers and the commodity broker. At the request of the producer and after the producer deposits the cost of the premium minus the subsidy, ASERCA will contract the put options in the futures market.

Important requirements for a producer to qualify for the APOP include: (a) the producer needs to be creditworthy or own the land, which is viewed as collateral; and (b) the participant must produce by himself, or in association with other producers, at least 23 metric tons of cotton. Thus, many producers can join together so as to meet the minimum volume requirement (World Bank, 1999).

Under the Mexican program, the cost of the option is shared between farmers and the government. Thus, Mexico's program is not expensive to administer and is demand driven, enabling the government to reduce its presence should a market for private brokers develop (Varangis and Larson, 1996).

Implications

Commodity derivative instruments assure farmers of a minimum price for their crop within a given year, allowing them to know their minimum revenue in advance, given an expected level of production. By hedging price risk through commodity derivatives, private traders are able to lock in profit margins, and reduce commercialization margins. Also, the government will be able to remove uncertainty regarding fiscal costs (World Bank, 1999).

Commodity risk management tools expose market participants to market prices and to market expectations of future prices. This will help coordinate production with anticipated demand and increase adjustment of production towards comparative advantage enhancing efficiency of resource allocation.

However, hedging price risk in commodity derivative markets requires highly demanding economic and institutional conditions for a developing country. Risk management activities require technical skills with considerable knowledge of financial instruments, and an understanding of the risk structure of the economy. An analysis of the causes, nature and magnitude of basis risk (lack of correlation of local to international prices) is required. Basis risk is more of an issue for agricultural commodities, and can make it difficult to offer price insurance. Basis risk can result from a variety of factors. For example, the design of futures contracts traded in developed countries reflects mostly local needs, which may be quite different from needs in developing countries. Commodities of specific origins, quality or grade often suffer from large unpredictable discrepancies between local and international prices.

In developing countries, production and trade in agricultural commodities are usually fragmented and diffused. Farmers lack the volume necessary to sell a futures contract, the infrastructure necessary to access derivative markets (hardware, internal systems, know-how, etc..) and the capital required for such transactions. Thus, a key issue in making risk management instruments available to small producers is building the necessary institutions that would allow the aggregation of price risks from many small farmers by a larger entity and this entity should hedge its assumed price exposure in international markets. This entity would retail risk management instruments to small farmers. In some cases, the government puts in place directly an aggregating institution. Examples include the government agency ASERCA in Mexico which hedges cotton prices on behalf of producers, and the National

Coffee Association of Guatemala, ANACAFE, which provides similar services for smallholder coffee producers.

Other institutional issues required to access commodity derivative markets include the introduction of adequate reporting, recording, monitoring and evaluating mechanisms and the establishment of internal control procedures to protect against speculative transactions and execution errors. Collateral law and property rights, and the central bank's regulations for using foreign exchange to hedge transactions, must be clarified.

Hedging requires a competitive well-functioning local market with transparent prices, a sufficient number of traders, speculators and financial institutions interested in a futures exchange. The necessary infrastructure in areas such as communications, transportation, storage and information processing, has to be established. The development of the Internet has allowed increasing opportunities for computer-based trading and price discovery.

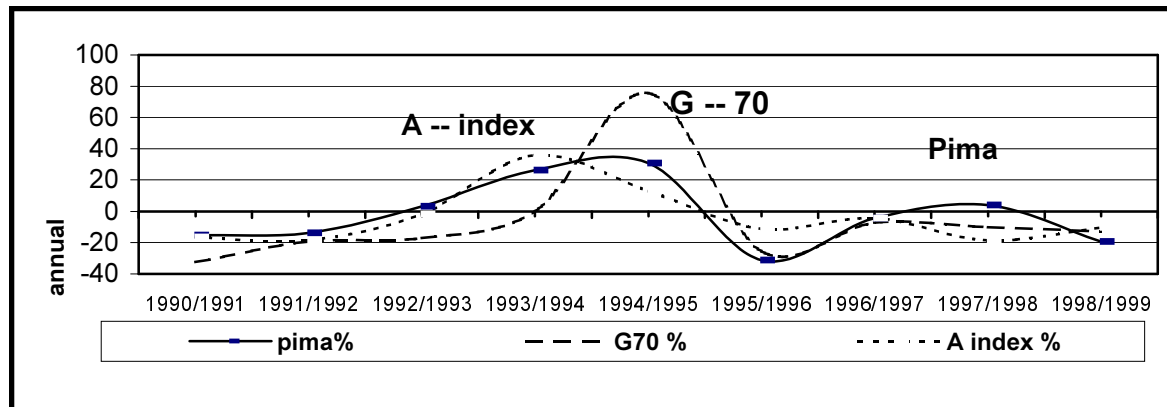
III. Benefits and Costs of the Egyptian Cotton Pricing Policy

Volatility in world cotton prices is an important policy issue for Egypt, as cotton is a key commodity that affects many economic agents and activities. The government attempts to manage these price fluctuations, while reconciling conflicting interests of cotton sector's market participants. The aim of this part is to highlight the nature of the world cotton prices volatility problem, and the government's efforts to cope with this problem through cotton pricing policy and its impact on cotton growers, private traders, and government's finance.

Cotton World Prices Volatility

Egypt is exposed to volatility in cotton world prices. During 1990/91-1998/99, the annual percentage change in world prices ranged from -18 percent to +35.7 percent for the Cotlook A-index, and between -31 percent and +30.8 percent for the American Pima cotton, and fluctuated from -32.5 to +75.7 for the Egyptian extra-long staple variety Giza-70, as shown in figure (1).

Figure 1. Volatility in Cotton World Prices, 1990/91-1998/99 (Annual % change)



Notes: A-index is considered the world price of cotton. It is an average of the five less expensive out of 14 types of cotton (Middling 1-3/32") traded in North Europe. The American Pima cotton is considered the main competitor of Egypt's extra-long cotton staple varieties. Giza-70 represented 53.8% of Egypt's extra-long export varieties, on average during 1992/93-1999/00 (Baffes and Ajwad, 1998).

Source: Calculated from the Egyptian Cotton Gazette- Alcotexa, various issues.

Government's Cotton Pricing Policy

To face cotton world prices volatility, the government has established a deficiency payments system since 1997/98, to protect cotton growers through seed cotton guarantee prices and to encourage private sector's participation in the cotton market. ⁽³⁾ The different aspects of this scheme, the pricing policy, trading system, and institutional setup, are discussed below.

Cotton Pricing Policy

The government sets seed cotton guarantee prices for farmers, before or at cotton planting time (March). At the start of the cotton-marketing season (September), if these seed cotton guarantee prices prove to be higher than the announced lint cotton export prices, trade in seed cotton becomes unprofitable. The government announces a deficiency payments system to cover the difference between seed cotton guarantee prices and lint cotton export prices, thus allowing private sector's participation in the cotton market. In case seed cotton guarantee prices are lower than the declared lint cotton export prices, the private sector can trade at a profit and the government does not incur any deficiency payments (Ariza-Nino, Siddik, and Swanberg, 1997a and b).

Seed cotton guarantee prices

Seed cotton guarantee prices are mainly determined by the cost of production criterion. The following formula shows how the guarantee price for a seed kentar of a certain variety of cotton, say Giza-70, is determined:

$$GP_{G-70} = \frac{PC + LR - SC}{AP}$$

Where:

GP_{G-70} = Guarantee price for a seed kentar of Giza-70.

PC = Total production costs / feddan.

LR = Land rent for cotton planting period.

SC = Value of short-clover.

AP = Average productivity of a feddan of Giza-70.

Although this cost of production criterion for price level determination, is grounded in the real economic conditions of the majority of cotton growers, and provides a definite link between farm incomes and farm prices, yet it has three main defects. First, seed cotton guarantee prices are completely isolated from world prices. If world prices drop over the course of the growing season, the government cannot adjust seed cotton guarantee prices downward to reflect changed market conditions by harvest time. Seed cotton guarantee prices should give the appropriate long-run incentives. A standard way to estimate long-run price levels is to use a moving average of three to five years past world prices for a type and quality of cotton comparable to the Egyptian one; as the American Pima. The moving average procedure ensures that seed cotton guarantee prices track the long-run prices, albeit with a lag. In forming a moving average, it is desirable to make adjustments both for exchange rate changes, and for changes in purchasing power by using a supply-side deflator (a producer price index), because commodity prices are determined in the long run primarily by costs.

Second, seed cotton guarantee prices do not offer incentives for cotton growers to improve efficiency. Thus, in setting guarantee prices, cotton farmers should be constantly forced to look for more economical ways of doing things. The government may reduce seed cotton guarantee prices (measured in real, inflation-adjusted terms), say every three years at

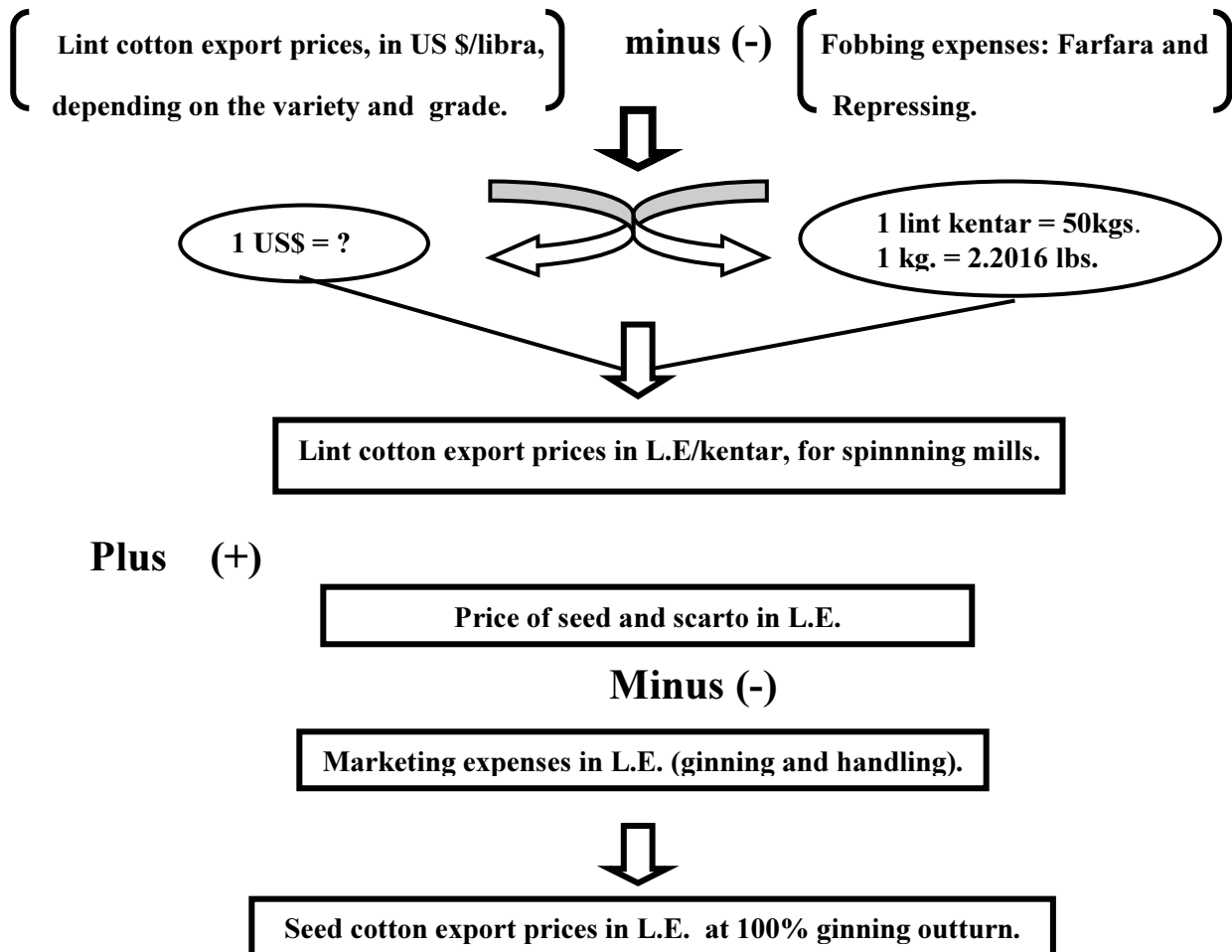
a rate based on the rate of cost reduction (productivity growth) achieved during the previous years by an average cotton grower. During these three years, any reduction in costs that a cotton grower succeeds in achieving is a reward for his efficiency. After three years, which is by the time of reducing seed cotton guarantee prices, if a cotton grower achieves cost savings greater than those obtained in the past, his real costs will fall faster than his real prices, and he will be permitted to keep the resulting profits as his reward. However, if the cotton grower reduces his costs only by, say 2 percent, after these three years whereas in the past his costs fell 3 percent, the seed cotton guarantee prices will also be falling at a 3 percent rate. This cotton grower will therefore lose profits, suffering a penalty for his inefficiency. This approach clearly gives up any attempt to limit the profit of cotton farmers, leaving the possibility of higher profits as an incentive for efficiency.

Finally, the net revenues from the cotton rotation and the other competing rotations are not brought into the seed cotton guarantee prices policy decision. Guarantee prices should keep balance among net returns obtained from different crop rotations to make cotton competitive with other crops. Also, it may be useful to announce seed cotton guarantee prices before the planting time of wheat (November) rather than before the planting time of cotton (March). This is because if a farmer decides to plant wheat on a piece of land, that land will almost certainly not be available for cotton production the following summer, as cotton is planted in March or April, while wheat harvest normally occurs in April or May (Krenz, Schoen, and Abo El Wafa, 2000; and Egyptian Ministry of Economy and Foreign Trade, 1999).

Lint cotton export prices

Lint cotton export prices are announced at the start of each marketing season, in September, after study of the international cotton situation. Lint cotton export prices are adjusted in order to bring them into comparison with seed cotton guarantee prices. This adjustment is determined by three main factors, namely, fobbing and marketing expenses, the price of seed and scarto and the exchange rate, as shown in figure (2).

Figure 2. Method to calculate seed cotton export prices based on lint export prices



Lint cotton export prices are inversely related to both fobbing and marketing expenses and to an overvalued exchange rate, but positively related to the value of seed and scarto. The government administratively sets fobbing and marketing expenses at a low level, and the value of seed and scarto at a high level, in order to increase lint cotton export prices, narrow the gap between them and seed cotton guarantee prices, and hence reduce the amount of deficiency payments. In 1999/2000, the government fixed marketing expenses at LE.50/kentar although the actual expenses were estimated at LE.66/kentar. Seed and scarto were administratively valued at LE. 10/kentar, although their actual value ranged between LE.3-LE.4/kentar, representing an overvaluation of nearly 150 percent. (Alcotexa, 2000).

However, setting fobbing expenses at unrealistic low levels, increases lint cotton prices for domestic spinning mills (lint cotton export prices after deducting fobbing expenses), resulting in two main adverse consequences. First, domestic spinning mills' production

costs increase; and second; selling lint cotton to domestic spinners becomes more profitable than exports, with negative impact on Egyptian lint cotton exports. Thus, marketing margins should not be fixed administratively but determined by marketing, processing, and transportation costs as well as competition.

In light of high seed cotton guarantee prices, the government encourages Alcotexa to set Egyptian lint cotton export prices at high levels relative to the competing American Pima, with few adjustments during the season, as shown in table (2).

Table 2. Egyptian Lint Cotton Export Prices as a percentage of the Price of US. Pima* (%)

Varieties\Season	1996/97	1997/98	1998/99	1999/00
Giza-45	171	219	189	162
Giza-70	120	116	100	109
Giza-76	126	121	103	111
Giza-77	115	109	96	106

*Grade 3, CIF, North Europe for Nov-Dec delivery.

Source: calculated from the Egyptian Cotton Gazette- various issues, Krenz et.al., 2000; Krenz, 1999; and Krenz and Mostafa, 2000.

While Egypt overprices its lint cotton exports, the United States supports the American Pima cotton. The United States aims at making Pima cotton export prices competitive and lower than the prices of other competing cotton in the international market, particularly the Egyptian variety Giza-70. The American government has allocated US\$ 10 million, to support the American Pima prices during the period (1/10/1999-2003). Subsidy payable to American exporters and mills is triggered if:

- The average American Pima prices for grade 3, 1-3/8 (44), are higher than the price of Giza-70, grade good +3/8, CIF North Europe quotations, adjusted for quality differentials and transportation costs to the United States, for four consecutive weeks.
- The Pima cotton is being exported or used in an American mill during the period in which the subsidy is payable.
- Payments will be suspended if the adjusted world price of Giza-70 exceeds 134 percent of the basic loan for Pima cottons (77.35 cents/libra in 2000/20001).

The method of calculating the amount of subsidy due to an American exporter or mill, is found in appendix (1).

This overpricing and inflexibility of Egyptian lint cotton, depresses exports below what they could have been with more realistic export pricing, and dampens demand of domestic spinning mills for expensive Egyptian lint, encouraging them to increase imports of cheaper cotton yarns or artificial fibers. Ultimately massive lint cotton stocks are built up.

In 1999/2000, the price of Pima had dropped by 22 percent, but Alcotexa lowered Egyptian lint cotton export prices by much less. Export prices of extra-long staple varieties were decreased by about 13-14 percent, (Giza-45 was decreased by a much larger amount), while prices of long-staple varieties were decreased by 4-6 percent only, resulting in a decline in Egyptian lint cotton exports of nearly 9 percent.

The overpricing of Giza-70 in 1997/98 and 1998/99 seasons resulted in large carryover of stocks. Late in 1999/2000 season, active sales of this variety (an expansion of commitments by 3,964 mt. from May to July 1999), confirmed that this variety is responsive to price changes (Alcotexa, 2000; Krenz, and Mostafa, 2000; Holtzman and Mostafa, 1998 and 2000).

Carrying excessive stocks has a high opportunity cost; the storage space has a monthly cost, funds are tied up in holding the stock, and the lint cotton deteriorates over time, especially when the storage conditions are not optimal. It becomes difficult to export stored lint to foreign buyers the following marketing season. Ultimately, large carryover stocks have to be provided to domestic spinners at a discount, sold at a deep discount on the world market, or sold for alternative uses.

Trading system

The government, through the Principal Bank for Development and Agricultural Credit (PBDAC), has established a network of sales rings throughout the country to ensure that farmers have a buyer at the guarantee price. The government is “the buyer of last resort”. (PBDAC) sales rings are allocated administratively between public and registered private traders, with no competitive bidding.

A trader who is allocated a sales ring is obliged to take all of the cotton delivered to the ring, regardless of the grade, and has to pay the guarantee prices to PBDAC and then PBDAC pays the farmers. Traders are paid the deficiency payments only if sales take place in an official market.

The allocation of sales rings is a critical matter, particularly when it is known that the season is a short crop, and demand for rings exceeds the supply. If the government does not

auction off these sales rings in a competitive market, traders that are allocated these rings will reap monopoly profits. In that case, the government must decide the basis for distributing these sales rings among potential traders. Furthermore, because of monopoly profits, potential traders are likely to devote a great deal of effort to lobbying to obtain them (in so-called rent-seeking activities). Thus, administrative allocation of sales rings not only replaces the market mechanism but also results in waste from the point of view of the economy as a whole and contains the seeds of corruption.

Institutional setup

Despite efforts to liberalize and privatize the cotton sector since 1994/95, the government continues to dominate key industries in the cotton sector (trading, ginning, and spinning), to make decisions concerning seed cotton pricing and procurement, and to influence decisions regarding lint cotton export prices, yarn and fabric, ginning charges, and supplying of lint cotton to domestic mills.

Various ministries, entities, and committees set various cotton prices, and marketing rules. The Ministry of Agriculture, in consultation with the Ministry of Trade and Supply, the Ministry of Economy and Foreign Trade, and the Ministry of Public Enterprises, sets seed cotton guarantee prices, and marketing regulations. Lint cotton export prices are set technically by the Alexandria Cotton Exporters Association (Alcotexa), but unofficially influenced by the Ministry of Trade and Supply, and the Ministry of Economy and Foreign Trade.

The Ministry of Agriculture and the Ministry of Trade and Supply are responsible for the establishment and control of a Cotton Prices Stabilization Fund. The Ministry of Finance is to deposit sufficient resources into this fund to cover the needs of the deficiency payment scheme. A committee within the Ministry of Agriculture is responsible for considering the possibility of making deficiency payment to buyers of seed cotton outside of the official rings (direct from farmers).

The Cotton and International Trade Holding Company (CIT-HC), under the supervision of the Cotton Supervisory Committee of the Ministry of Trade and Supply, allocates the Principal Bank for Development and Agricultural Credit sales rings to private and public traders. Cotton trading and spinning and weaving companies are under the Ministry of Public Enterprises. Prices of yarn for export are set by the Textile Consolidation Fund,

which is under the Ministry of Industry and purchased by affiliated companies under the Ministry of Trade and Supply.

Uncoordinated decisions and contradictory results are most likely to occur. Successful pricing policy requires a single, independent unit, which is recognized by all other agencies as having the dominant coordinating responsibility for price policy formulation.

Implications of Government's Cotton Pricing Policy

Notwithstanding the merits of the government's efforts to manage cotton world prices volatility, by establishing a deficiency payments system to protect cotton growers through seed cotton guarantee prices, and to encourage private sector's participation in the cotton market, some adverse consequences have resulted. The impact of government's cotton pricing policy on cotton farmers, private traders, and government's finance, is analyzed below.

Cotton growers

The government succeeded in protecting cotton growers from the volatility in export prices, through seed cotton guarantee prices. Cotton growers captured 114-128 percent of export prices in 1997/98, and 103-104 percent in 1999/2000. When the government did not set guarantee prices in 1998/99, farmers received only 89-97 percent of export prices, as shown in table (3).

Table 3. Seed Cotton Prices as a Percent of Lint Cotton Export Prices for Three Major Export Varieties (1997/98-1999/2000)

Variety\ Season	1997/98	1998/99	1999/00
Giza-70	114	92	104
Giza-86	126	97	103
Giza-80	128	89	103

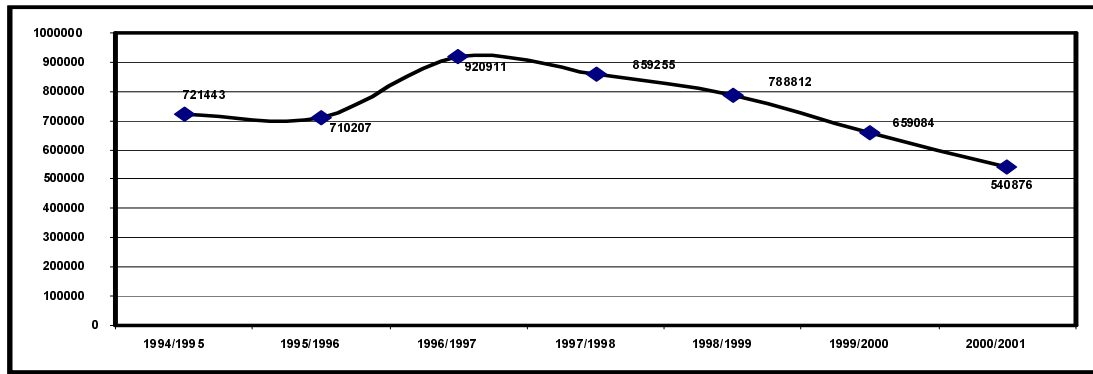
Notes: 1-Seed cotton prices are for the grade of Good +1/8 at the average ginning outturn for the season as reported by the Cotton Arbitration and Testing General Organization (CATGO).

2-Export varieties at the grade of good/fully good.

Source: Calculated from the Egyptian Cotton Gazette- Alcotexa, no. 155, October 2000, Krenz et.al., 2000; and Krenz and Mostafa, 2000.

However, seed cotton guarantee prices are not a sufficient incentive for farmers to grow cotton, as can be seen from the declining trend in the area planted with cotton, shown in figure (3), for the following reasons:

Figure 3. Area planted with cotton in Egypt [1994/95-2000/01], in feddans.



Source: Calculated from the Egyptian Cotton Gazette- Alcotexa, no. 155, October 2000.

- Government's pricing policy is uncertain. Seed cotton guarantee prices may not be set every year. In 1998/99, the government did not announce guarantee prices, and farmers were faced with a price decline of 21-29 percent from the previous season, depending upon variety. Farmers responded by reducing the area planted with cotton by 16.5 percent the following season.
- Government's financial assistance to farmers for production costs, such as combating pests, fertilizers and land preparation, is uncertain and differs each year (Gamaleldin, 2000).
- The profitability of the major crop rotations is not strictly taken into consideration in determining seed cotton guarantee prices. Cotton rotation is less profitable than other crop rotations in various governorates, and may even cause losses to farmers in some other areas. For example, in Behira, which is the major governorate in the production of the main extra-long staple cotton variety Giza-70, cotton rotation ranks fourth in terms of profitability among the major crop rotations. In Daqahliya, which represents those areas producing long-staple cotton varieties, farmers incur a loss from the cotton rotation (see tables [1] and [2], in appendix [2]).

Cotton private traders

The setting in which trade takes place is not competitive in order to encourage private traders to participate in the seed cotton market and offer better prices to farmers. Price competition in the seed cotton market is still very little, for the following marketing as well as financial reasons:

- Marketing aspects:
 - Absence of clear criteria for the allocation of (PBDAC) sales rings, with the majority of the rings held for public companies.
 - Allocation of PBDAC sales rings, before private traders have full knowledge regarding the deficiency payment scheme.
 - Requirement to purchase all of the seed cotton delivered at the ring, however poor the quality, and to pay the government's declared guarantee prices.
- Financial aspects:
 - The financial sources of the Cotton Prices Stabilization Fund and the extent of their sustainability seem not to be clearly known to private traders, thus undermining government credibility. Private traders have no adequate assurances regarding reimbursement for deficiency payments (Ariza-Nino, Siddik, and Gleason, 1998).
 - Setting fobbing and marketing expenses at unrealistic low levels.
 - The requirement of a financial guarantee to purchase seed cotton from a PBDAC ring, from private traders only, is considered by some of them to be discriminatory, favoring public traders. Only private traders are obliged to supply a bank letter of guarantee to PBDAC for 5 percent of the estimated value of the cotton to be delivered to the ring. It is worth mentioning that the value of the cotton delivered to the average sales ring was L.E. 1.5 million in 1999/2000.

Government's finance

An important problem facing the government in its attempt to manage cotton world prices fluctuations is the need to allocate sufficient and sustainable financial resources to the Cotton Prices Stabilization Fund. Moreover, the amount of deficiency payments that must be borne in any given year is uncertain, depending mainly on the international cotton market situation. In 1997/98, seed cotton guarantee prices were higher than lint cotton export prices, and the deficiency payment scheme announced by the government was worth

L.E. 558 million. ⁽⁴⁾ In the 1998 cotton production season, the government did not declare seed cotton guarantee prices to producers before or at the time of planting, and discontinued the deficiency payment program. In 1999/2000, lint cotton export prices were considerably lower than the previous season, and the government announced a system of deficiency payments that was worth L.E. 71 million, as shown in table (4).

Table 4. Deficiency Payments (1997/98-1999/00) '000 L.E.

Variety\Season	1997/98	1998/99	1999/00
Giza-45	0.00	0.00	5091
Giza-87	0.00	0.00	0.00
Giza-76	6399	0.00	0.00
Giza-70	63345	0.00	11601
Giza-77	21498	0.00	0.00
Giza-88	0.00	0.00	241
Giza-86	64755	0.00	20862
Giza-75	153753	0.00	0.00
Giza-89	8004	0.00	10017
Giza-85	119606	0.00	8734
Giza-80	87353	0.00	8015
Giza-83	33005	0.00	6548
Total	557717	0.00	71108

Source: Egyptian Ministry of Economy and Foreign Trade, 2000a.

IV. Policy Options for Egypt

Country experiences, including Egypt's, reveal that managing cotton price risk effectively does not come without cost. World cotton prices are extremely volatile and there is no optimal policy to face this problem that can be adopted in all countries at all times.

Many governments, such as in Mexico that once relied on domestic price stabilization schemes, have been abandoning these schemes, because they were found to be costly and unsustainable. These governments are reducing or eliminating guarantee prices on cotton, and compensating farmers by direct-income support instead. However, as the replacement of guarantee prices by direct-income transfers exposes farmers and traders to the higher risk of volatile cotton prices, these governments began to offer market participants the opportunity to purchase price insurance, through put options.

Managing cotton price risk effectively in Egypt requires the government to focus its efforts first on better administration of the current cotton pricing policy by implementing a set of proposed reforms. Second, the government could consider creating the economic and institutional conditions necessary to move smoothly from price-based subsidization to direct-income support compensation. It could also consider offering farmers minimum cotton price guarantees, for a predetermined fee, then use those fees to purchase put options in foreign commodity derivative markets.

Reforming the Current Cotton Pricing Policy

The pricing policy, trading system and institutional setup of the deficiency payments system require some reforms.

Pricing policy reforms

Cotton pricing policy requires three main reforms:

- Linking seed cotton guarantee prices to world cotton prices, by using a moving average of three to five years past world prices for a type and quality of cotton comparable to the Egyptian one, as the American Pima. This moving average is to be adjusted both for exchange rate changes, and for changes in purchasing power by using a producer price index.
- Competitive and flexible pricing of Egyptian lint cotton exports is needed relative to the competing American Pima. Pricing Egyptian exports should take into consideration the United States support to Pima export prices and at the same time the relative monopolistic situation of Egyptian cotton.
- Marketing margins between export prices and guarantee prices should not be fixed administratively but determined by competitive forces.

Trading system reforms

An efficient trading system that would allow buyers to offer competitive prices to growers should be developed by:

- Allocating sales rings through competitive bidding.
- Announcing deficiency payments well in advance, and to pay them without delay.
- Gradual privatization of the public sector cotton trading companies.

Institutional reforms

For a successful cotton pricing policy and in order to avoid uncoordinated decisions and contradictory results, the government needs:

- A single entity, which is recognized by all other agencies as having the dominant coordinating responsibility for price policy formulation.
- A well-identified institutional setup for the Cotton Prices Stabilization Fund.
- A financially independent, and self-sustainable Stabilization Fund.

Moving Toward Direct-Income Support Compensation

If the government decides to compensate cotton growers for the reduction or elimination of seed cotton guarantee prices, by replacing price support by a lump-sum transfer, then decision-makers need to be aware of the following issues:

- Direct-income support should have a time limit. The program is to be phased out in a certain number of years.
- A national land registry that determines eligible producers and the amount of land covered by the program should exist before the announcement of the program, to ensure fair and timely production payments. Land-tenure rights are needed.
- The fiscal costs of the program should not exceed the costs of the program they replace. Rather than being fixed, payments should be linked to world prices so that during periods of high world prices, producers receive offsetting lower income-support and vice versa. In addition, rather than having uniform level of per feddan support, a declining index may be applied. For example, the first 10 feddans receive full support, the next 10 feddans receive less support, and so on, effectively increasing the relative support to small producers and hence enhancing the effect of the program in reducing poverty. Also, limits in terms of maximum feddans eligible for income support are an equitable device for containing fiscal costs and reducing support to larger producers. The program should not be announced before registry is completed; otherwise such declining index may not be as effective since farmers will have an incentive to divide the land among family members and hence fall in the lower bracket.

Hedging Cotton Price Risk in International Commodity Derivative Markets

Recent legal and institutional developments in the Egyptian stock and financial markets could facilitate access to international commodity derivative markets. However, cotton production in Egypt is fragmented.⁽⁵⁾ Farmers and traders lack familiarity with futures markets and expertise in how to use them. Thus, the Egyptian government, through the Principal Bank for Development and Agricultural Credit, farmers' associations or cooperatives, can support farmers, by offering them minimum price guarantees, for a predetermined fee, and hedges the price risk by using fees to purchase put options in the New York Cotton Exchange (NYCE) market. By paying a fee and participating in the program, a farmer in effect purchases insurance against a drop in prices below a certain level. The program will be inexpensive to administer and demand driven, so the government can readily reduce its presence and gradually allow price risks to be incurred and managed by private entities (Ariza-Nino, et.al., 2000; and Faruqee, Coleman, and Scott, 1997).

For Egyptian cotton, there may be no ideal hedging tool. In fact, there may be a considerable mismatch between the characteristics of the Egyptian cotton to be hedged and the characteristics of the commodity on which the hedging tool is originally based.⁽⁶⁾ Over-the-Counter contracts could also provide a more suitable hedging instrument, since they can be customized.

V. Conclusion

In view of the volatility of cotton prices in world markets and the importance of cotton for the Egyptian economy, there is clearly a need to continue to follow one mechanism or another to protect the farmers, traders, and industrialists as well as a need to minimize the cost to the treasury and capture the greatest revenue from cotton exports for the economy.

In dealing with cotton price volatility, different countries have adopted one or more of three alternative approaches: domestic price stabilization schemes, direct income support programs, and the use of commodity derivatives. Each of these approaches has its pros and cons, especially in terms of who carries the risk of price volatility.

The benefits and costs of the Egyptian cotton pricing policy that follows the domestic price stabilization approach were analyzed. The Egyptian government policy has achieved the objective of protecting cotton growers from volatility in world cotton prices, by

guaranteeing them a support price. In addition, the policy may have helped Egypt to capture greater revenue from exports in the world market, given the degree of market power Egypt enjoys in the high quality variety of cotton.

Despite the merits of this policy, it has had various adverse effects on cotton growers, private traders and the government's treasury. Guarantee prices are mainly determined by the cost of production criterion, and hence do not offer cotton growers enough incentives to enhance productivity. As growers always find a buyer at the guarantee price regardless of the grade, and as price differentials between grades are very small, they do not have an incentive to produce higher quality cotton. Moreover, as the government does not announce guarantee prices every year, cotton growers become uncertain about the pricing policy, and may be discouraged from growing cotton.

The setting in which trade takes place is not competitive. It discourages private traders' participation in the cotton market. Sales rings are allocated administratively between public and private traders, with no competitive bidding and with the majority of the rings held for public companies. These rings are allocated before private traders have full knowledge regarding the deficiency payment scheme. A trader who is allocated a sales ring, is required to purchase all of the seed cotton delivered at the ring, however poor the quality and is required to pay the government's declared guarantee prices.

Setting marketing margins between export prices and guarantee prices administratively at unrealistic low levels, in order to narrow the gap between them and hence reduce the amount of deficiency payments, made selling lint cotton to domestic spinning mills more profitable than exports, with negative impact on exports, particularly extra-long staple varieties. The overpricing and inflexibility of Egyptian lint cotton, depressed exports below what they could have been with more realistic pricing, encouraged domestic spinning mills to increase imports of cheaper cotton yarns and artificial fibers, and resulted in large carryover of stocks.

The government bears a large fiscal and administrative burden in setting guarantee prices, allocating sufficient financial resources to cover the deficiency payments and organizing the trading system. The government is the entity most exposed to world cotton price risk.

Concerning the institutional setup of the current pricing policy, various ministries, entities and committees, set various cotton prices and marketing rules, which most likely

result in uncoordinated and contradictory decisions. The institutional setup of the Cotton Prices Stabilization Fund is not well identified, its financial sources and their sustainability are not clear.

The paper concluded that managing cotton price risk effectively in Egypt requires the government to focus its efforts first on better administration of the current policy by implementing a set of proposed reforms. Second, the government could consider creating the economic and institutional conditions necessary to move smoothly from price-based subsidization to direct income support compensation, and to use commodity derivatives in international cotton exchanges. Over time, direct income support programs should be gradually phased out, while the use of commodity derivatives, may be enhanced.

The better administration of the current policy requires some reforms in the pricing policy, trading system and institutional setup. Concerning pricing policy reforms, guarantee prices should be linked to world cotton prices, by using a moving average of three to five years of past world prices. Competitive and flexible pricing of Egyptian exports is needed relative to the American Pima cotton. Pricing Egyptian exports should take into consideration the United States support to Pima export prices, and at the same time, the relative monopolistic situation of Egyptian cotton. Marketing margins between export prices and guarantee prices should not be administratively determined.

An efficient trading system that would allow buyers to offer competitive prices to growers should be developed by allocating sales rings through competitive bidding after private traders are fully informed about the deficiency payments. Gradual privatization of the public sector cotton trading companies could be considered.

A successful policy that avoids uncoordinated decisions and contradictory results requires the creation of a single independent organization to deal with all aspects of cotton production, pricing, trading, the stabilization fund, and cotton policy formulation. The new entity should have a clear mandate, and entrusted with the flexibility and resources to ensure its success in maximizing the benefits to the economy.

Endnotes

- (1) During 1996-2000, cotton represented 57 percent of total Egyptian agricultural exports, on average (Egyptian Ministry of Economy and Foreign Trade, 2000b and Egytex, 2000).

- (2) Options give users protection against unfavorable price movements without losing a chance to gain profits from favorable movements. The purchaser of a put option, will exercise it if prices decline and be compensated for the lower price at which he sold the commodity. If prices increase, the purchaser of the option will not exercise it and all profits from the higher price will accrue to him. An option can be a purely financial transaction and does not require a commitment regarding physical trade of the commodity, therefore avoiding risks related to delivery and performance under the contract. The purchase of an option does not require margin, which may be easier for its purchaser from a cash flow point of view. However, options require the payment of a premium that depends on the level of price protection (floor), and on the time horizon covered by the insurance (typically less than a crop year for agricultural products), which could be costly at times.

- (3) As of 1994/95, the government declared and supported floor prices. Farmers received 90-94 percent of the export prices. World cotton prices were increasing in 1995/96, and prices paid to growers by registered traders exceeded the floor prices. In 1996/97, the government set floor prices for seed cotton at 107-134 percent of the export prices, before planting. However, world prices dropped over the course of the growing season and the government could not adjust floor prices downward to reflect changed market conditions by harvest time.

- (4) In 1997/98, the Egyptian minimum export price was about 32 cents above prices in North Europe for US Pima, considered the benchmark price in the extra-fine cotton sector. As prices paid to growers did not include transportation to Egyptian ports, which was an estimated 6 US cents per pound, the differential between the price of Giza-75 and the price of US Pima in 1997/98 was estimated at 38 US cents per pound. Based on the level of production and the estimated assistance per pound of 38 cents, the Government of Egypt provided an estimated US\$290 million in assistance to growers (Gasanfer, 1999).

(5) The fragmentation of cotton producers has a definite influence on the seed cotton market structure. The average cotton producer produced only 7.4 kentars of seed cotton to sell in 1998/99. (This was based on an average of 1.53 Fds. and a yield of 4.85 kentars/Fd.). Thus, a trader who wanted to purchase 100,000 kentars of cotton would have to visit 13,500 producers if he bought cotton directly from farmers (Krenz, R.D., 1999, p.34).

(6) Although there is no comparable futures market for Egyptian long-staple cotton or its counterpart, American Pima, yet the prices of Pima in California maintains a nearly constant 3:2 relationship with the NYCE price for ordinary staple (MSL) cotton (Arizano, Swanberg, Siddik, and Schrader, 2000).

Appendix 1

Calculating the American Pima subsidy

1-Calculate the average American Pima prices for grade 3,1-3/8 (44), in a certain week:
 [San Joaquin Valley grade (3) + Desert Southwest grade (3)] / 2,

For example, [101+98,75] / 2 = 99,87 cents/lb.

Note that one week = five days from Friday to Tuesday.

2-Calculate the price of Giza-70, grade/good +3/8, from CIF North Europe quotations;
 adjusted for quality differentials and transportation costs to the USA.

For example:

Price of Giza-70 good/3/8 CIF North Europe. 119,50 cents/libra.

MINUS (-)

Grade/ quality differential between G-70 and American Pima 7,00 cents/libra.

MINUS (-)

Transportation costs to the U.S.A. 13,16 cents/libra.

=

99,34 cents/libra.

3-Amount of subsidy = [99,87- 99,34] * 500 [weight of an American bale] / 100
 = [0,53 cents/libra] * 500 / 100 = 2,65 US\$/ bale.

Appendix 2

Table 1. Profitability of Major Crop Rotations in Behira Governorate in 1999/2000

Rotation	Net Return including land rent, in L.E./feddan*
Long-berseem and rice	1450
Wheat and rice	1203
Long-berseem and maize	845
Fava beans and cotton	740
Short-berseem and cotton	622
Wheat and Maize	594

*Average land rent of L.E. 1102/feddan.

Source: Krenz, R.D., H. Schoen, and M. Abo El Wafa, 2000.

Table 2. Profitability of Major Crop Rotations in Daqahliya Governorate in 1999/2000

Rotation	Net Return including land rent, in L.E./feddan*
Long-berseem and rice	1199
Long-berseem and maize	733
Wheat and rice	719
Wheat and maize	256
Fava beans and cotton	-129
Short-berseem and cotton	-746

*Average land rent of L.E. 1102/feddan.

Source: Krenz, R.D., H. Schoen, and M. Abo El Wafa, 2000.

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