COTTON EXPORTS AND INTERACTION WITH TEXTILE TRADE Darren Hudson Department of Agricultural Economics Mississispi State University Don Ethridge Department of Agricultural and Applied Economics Texas Tech University

Abstract

The competitiveness provisions in farm policy have been a popular tool for enhancing U.S. exports and domestic use of cotton. Prior research suggests that these provisions (embodied in part within the "Step 2" program) have increased U.S. exports of cotton. This study confirms prior research, but also finds that other factors in play since 1985, which may include unanticipated impacts of the competitiveness provisions, have also increased imports of foreign textile products to the detriment of the competitiveness of the overall U.S. cotton/textile sector. Although not definitive or complete, this research suggests that careful consideration of the competitiveness provisions approach, as well as other factors, is warranted.

Introduction

The competitiveness provisions in the cotton program are an important part of U.S. farm policy. The competitiveness provisions offer a payment to exporters and domestic users of cotton equal to the difference between the U.S. and world price of cotton (Hudson and Ethridge, 2000a). The Step 2 provision, based on a concept of a "marketing loan," has the purpose of making U.S. cotton price competitive so as to move U.S. cotton into world markets, given other program provisions. It does this by making U.S. prices consistent with world prices. It is important to note that the "marketing loan" refers to that general set of policies that have evolved since 1985 with a purpose of moving U.S. cotton onto world markets. The Step 2 provision is one component of the current operational version of a broader set of policies, which are referred to as the competitiveness provisions.

The competitiveness provisions have proven to be a large budgetary burden at times. In fact, the program exhausted its appropriated money supposed to last through 2002 by 1998, and new money had to be allocated by the U.S. Congress to keep the program operating. Previous research indicates that the competitiveness provisions have increased U.S. cotton exports (Hishamunda et al.), suggesting that continuation of the program is beneficial to U.S. cotton producers. Figure 1 shows U.S. cotton exports over the 1970-1999 period. Although exports vary from year to year, there has been an increasing trend in cotton exports. The first horizontal line in the figure represents the average level of exports over the 1970-1984 period (5.4 million bales). The second line represents the average exports over the 1986-1999 period (6.5 million bales), representing a 20% increase in cotton fiber exports. The averages are statistically different at the 95% level of significance, suggesting that exports have increased since the implementation of the competitiveness provisions in 1985.

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However, what are the implications of this program on the competitiveness of the overall U.S. cotton industry? That is, it appears that the competitiveness provisions have increased U.S. cotton exports, but what is the effect of the competitiveness on the rest of the cotton industry? This question has generally been unexplored (Hudson and Ethridge, 2000b), but may have important implications for the long-term competitiveness of the U.S. cotton industry. The purpose of this paper is to explore the implications of the competitiveness provisions considering all industry segments.

Cotton Trade

Cotton Exports-Imports

Exports have been a major source of demand for U.S. cotton, representing about 33 percent of production and use over the 1970-1997 period. The U.S. has been important to world cotton trade, averaging 22 percent of world cotton exports over this same period, but increasing that proportion to 25 percent over the 1985-1997 period. U.S. cotton fiber imports are very small and used primarily for specialty products. There have been periods of increased imports when the reported price of U.S. cotton rose substantially above the reported "world price" levels, but these periods have been rare.

The standard analysis of market share of global exports suggests that the U.S. is (1) a competitive producer of cotton fiber and (2) increasing its exports through time. This apparent competitiveness is supported by two primary factors. First, cost of production data suggest that the U.S. is cost competitive with other major cotton producing countries, although the data on comparative cost of production (ICAC, 1992, 1996) are not fully comparable because of differences in land tenure arrangements, input subsidies, and protection rates across cotton producing countries. Second, the implementation of the competitiveness of U.S. cotton by keeping U.S. cotton price competitive on world markets and increasing market share for U.S. cotton.

Net Cotton Trade Balance

Despite the apparent competitiveness of the U.S. in world cotton trade, the above description provides an incomplete picture. Cotton is a raw material that can be sold in unprocessed, semi-processed, and processed forms. The processing of cotton fiber is carried out in stages and has been executed independently in different parts of the world.

The U.S. is usually the second or third largest producer of cotton, depending on the year, and the largest exporter of cotton fiber. The U.S. also has a large, viable textile industry, which has been a major, and the most stable, consumer of U.S. cotton fiber. However, world textile trade has changed substantially. The U.S. has historically engaged the full spectrum of textile production from spinning and weaving to final assembly of finished goods, but the "labor-intensive" parts of this process (e.g., cutting, sewing, and assembly) have shifted away from developed to developing countries. U.S. manufacturing wages remain as much as twice those of the Asian newly industrialized economies (NIEs) (Figure 2), who represent primary competitors of U.S. textiles.

Because spinning and weaving technologies and activities allow substantial substitution of capital (and technology) for labor, the U.S. has maintained competitiveness in these industries. U.S. mills now export relatively lower-valued products, such as yarn and fabrics, as compared to higher-valued finished goods. However, considering cotton fiber and the cotton content of textile exports and imports, the U.S. has shifted from a large net exporter to a net importer of cotton (Figure 3). While the U.S. remains a large exporter of both cotton fiber and cotton textile products, the growth in cotton textile and apparel imports have outstripped exports, suggesting decreased competitiveness of the overall U.S. cotton complex.

A Preliminary Empirical Analysis

Many factors, including input costs, fiber prices, trade policies, and exchange rates, affect trade balances. To assess some of these effects in the cotton trade balance, the following model was formulated:

$NB_{\star} = \alpha \cdot W^{\beta_1} P^{\beta_2} DC^{\beta_3} ER^{\beta_4} I^{\beta_5} e^{\beta_5 USSR + \beta_6 CP}$

where NB, is the ratio of U.S. cotton (both cotton fiber and the fiber equivalent of textile products) exports to imports in time t, α is a constant, W is the ratio of the U.S. average manufacturing wage to the average manufacturing wage in Asian NIEs, P is the ratio of the Cotlook A Index world offer price for cotton (U.S.¢/lb; c.i.f. Northern Europe) to the U.S. Memphis Territory price of cotton c.i.f. Northern Europe (U.S.¢/lb), DC is the domestic mill use of cotton (1,000 lbs), ER is the trade-weighted exchange rate index (weighted by percentage of total U.S. cotton fiber exports to each country) in foreign currency per U.S. dollar, I is the real per capita Gross Domestic Product (base year 1985), USSR is a dummy variable for the break-up of the former Soviet Union (USSR = 1 for 1992 and after), CP is a dummy variable for the existence of the U.S. competitiveness provisions (CP = 1 for 1985 and after), and the β_i are parameter to be estimated. While the CP variable indicates pre- and post periods for the implementation of the competitiveness provisions, it may contain other forces that coincided with those times. The USSR variable is included to account for the fact that when the USSR broke up, Uzbekistan became a major competitor for the U.S. in the world market for cotton fiber.

The model parameters were estimated with data from 1975 through 1998 using full information maximum likelihood regression, and the results are presented in Table 1. Results show that the wage rate differential (W) had no significant impact on the net trade balance in cotton. This result is plausible because U.S. mills have shifted towards yarn and fabric production and increased these exports through time. Thus, the wage rate differentials have simply shifted the *type* of processing that occurs in different countries, with little impact on the volume of net cotton fiber trade. However, the *value* of exports/imports has necessarily changed; if U.S. mills have shifted to exporting cotton yarn and fabric in place of finished goods, the value-added between processing stages has been lost. Additionally, an increase in domestic mill use (DC) of 1% results in a 1.35% increase in the net trade balance. (Domestic mill consumption *also* reduces imports of foreign cotton.) This highlights the importance to the domestic cotton fiber industry of maintaining a competitive textile industry.

The relationship between U.S. and world market cotton prices (P), while marginally significant (p-value = 0.13), confirms that as world cotton price increases relative to the U.S. price, the U.S. net cotton trade balance improves. (The weak statistical significance in this variable is likely related to the fact that these were *cotton fiber* prices; world and domestic prices for cotton-containing textiles were not available.) The coefficient for the exchange rate index (ER) shows, as expected, that as foreign currencies (weighted by volume of trade) depreciated against the U.S. dollar, the net cotton trade balance declined. This variable was also based only on the volume of *cotton* fiber trade, not cotton textiles. The coefficient on *per capita* income (I) had the expected sign, but was not statistically significant, suggesting that increases in income do not affect the trade balance, *ceteris paribus*.

The dummy variable coefficient (USSR) for the break-up of the former USSR suggests that the entry of Uzbekistan into the world cotton market had a detrimental impact on the U.S. trade balance, as expected. Most of this impact comes in the form of direct competition with the U.S. for raw cotton exports. This effect is relatively small and may be temporary now that Uzbekistan has dissipated its accumulated stocks. An interesting result in this analysis is the inverse and statistically significant relationship between the existence of the competitiveness provisions (CP) export subsidy and the net trade balance (NB). These results suggest that the net trade balance is 1.25% lower, on average, during the period of the competitiveness provisions than during the prior period, other things equal. This result would seem nonsensical in a single sector (raw cotton fiber) model, but is realistic in a multi-sector framework.

Consider the following explanation. The competitiveness provisions program ensures that all U.S. cotton fiber produced sells at the "world price" to both domestic and foreign users (textile manufacturers). However, theory suggests that the subsidy actually lowers world prices, other things equal, by placing a larger quantity into the market at any given time. This situation is depicted in Figure 4. The initial situation is given by U.S. supply (S) and U.S. demand (D) in the United States panel, and U.S. export supply (ES) and world export demand for U.S. cotton (ED). U.S. cotton fiber exports without any subsidies are equal to E1 at a world price of Pw, and U.S. cotton production is Q1. Assume that the U.S. announces that it will pay the difference between Pus and the world price for use of cotton (both domestic and exports). This increases U.S. production to Q2 and creates a new export supply function (ES' ES). Focusing on exports, U.S. fiber export increase to E2, resulting in a lower world price Pw'. There is no definitive evidence that world prices have decreased as a result of this policy. However, the theory suggests this result as a maintained hypothesis and the magnitude of the effect is an empirical question.

By lowering world price, the export subsidy lowers cotton fiber costs for all manufacturers (including mills inside the U.S.). If the cost of the cotton fiber is a higher proportion of the total cost of producing cotton textiles in some developing countries (with lower labor costs, lower fixed costs, and fewer regulations) than in the U.S. (it should be noted, however, that not all developing countries benefit from this policy because some developing countries do not import cotton due to their own trade policies, thus effectively operating in a closed economy), then the subsidy has given those countries a cost advantage over the U.S., and has reduced the U.S. trade balance in cotton and cotton products. Consequently, the program may have achieved its purpose of promoting U.S. cotton fiber consumption, including exports, but it may have also increased U.S. consumption of textiles containing foreign-grown cotton. While the transfer of these processing stages to other regions of the world may be inevitable through other economic forces, it is possible that this policy could be accelerating that transition, thus detracting from the competitive position of the U.S. industry as a whole.

It should be recognized that because the CP is a binary indicator, it is possible that other structural effects are also being captured by this variable. For that reason, these results should be interpreted with caution.

Conclusions

The data point to two of general conclusions. First, the net trade balance for U.S. cotton has deteriorated significantly. Second, the evidence presented here *suggests* that the program *could* have been a contributing factor to that net export deterioration. Several qualifications are important to note. First, there are many complicated, countervailing factors in play. For example, imports of textile products from Mexico have increased substantially. However, there has also been substantial foreign direct investment by U.S. textile manufacturers in Mexico. This analysis does not account for that activity. Second, several of the variables in the model represent cotton (such as price), which may result in slightly different results.

There is economic rationale for the observations found here. The conclusion of this analysis is not that the competitiveness provisions are detrimental to the U.S. cotton industry. The conclusion is that while the

competitiveness provisions have increased cotton lint exports, it may be having unintended side effects. The policy may be indirectly contributing to a phenomenon that is being driven by a basic set of macroeconomic forces. This suggests that the industry will need to carefully consider the full range of implications of the policy structure.

References

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Table 1. Results of Regression of Net Cotton Trade Balance, 1970-	1998.
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	Parameter	Standard	
Variable	Estimate	Error	t-ratio
Intercept	-34.1149	21.8047	-1.56
W	0.080	0.3438	0.23
Р	1.546	0.9552	1.62 ^c
DC	1.351	0.5066	2.67 ^a
ER	-0.626	0.2277	-2.75 ^a
Ι	1.540	1.8879	0.82
USSR	-0.360	0.1952	-1.84 ^b
ML	-1.254	0.2028	-2.75 ^a
Log likelihood	11.7989		
Adjusted R ²	0.9193		
RMSE	0.1813		

^aStatistically significant at the 0.05 level. ^bStatistically significant at the 0.10 level. ^cStatistically significant at the 0.15 level.



Figure 1. U.S. Cotton Fiber Exports, 1970-1998.



Figure 2. Ratio of U.S. to Asian Manufacturing Wages, 1975-1998.



Figure 3. Ratio of Cotton and Cotton Containing Textile Exports to Imports, 1975-1998.



Figure 4. The Effects of an Export Subsidy on World Price and U.S. Cotton Fiber Exports.