The Trade Effects of MERCOSUR and The Andean Community on U.S. Cotton Exports to CBI countries

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I: Introduction

Since 1960, the formation of Regional Trade Agreements (RTAs) that exclude the United States has been proliferating throughout Central and South America: Mercado Comun del Sur (MERCOSUR), the Andean Community, the Central America Common Market (CACM), the Caribbean Common Market (CARICOM), and the G-3 agreement among Venezuela, Columbia, and Mexico. In addition, Chile has established its own agreement with MERCOSUR, as well as a long list of other bilateral agreements.

The rapid proliferation of these RTAs has engendered concerns about the disadvantages they bequeath upon non-members. Reeder, Torene, Jabara, and Babula (2005), in their analysis of "Regional Trade Agreements: Effects of the Andean and MERCOSUR Pact on the Venezuelan soybean Trade and U.S. Exports", affirmed and concluded that RTAs that exclude the United States can work to the disadvantage of U.S. exporters that are otherwise competitive in world markets.

In both Free Trade Areas and Customs Unions, preferential tariffs are granted to members while tariffs on third-country exports remain unchanged. This is by far, the most fundamental concern of third-country exporters because they face stiffer competition from suppliers within the bloc whose exporters now enjoy a preferential tariff rate, which coerce price and/or sales to reduce (trade diversion).

Nonetheless, Customs Unions (e.g. MERCOSUR and the Andean Community) have a propensity to be less disadvantageous for third-countries because even though they grant preferential tariffs to members, they also change third-country tariffs by establishing a common external tariff (CET). In most cases, tariffs are reduced in the CET; thus there may be improvement, or at least less deterioration, in third-country exports prospects.

Consequently, before Viner (1950), analysts often assumed that a customs union would be welfare improving, since some tariffs would fall and tariffs are, in general, welfare reducing. However, in 1950 Jacob Viner showed that a customs union will not necessarily improve welfare, since the tariff reductions occur in a world of second best (Clausing 2001).

Trade diversion is revealed by a decline in the income elasticity of demand for extra-area imports following integration. This occurs when RTA members shift their imports from more efficient, nonmember producers, to less efficient partner countries within the RTA due to preferential tariff treatment. This hurts consumers within the RTA, who now import from high-cost members in the RTA (Burfisher 1998).

In addition, trade diversion leads to less efficient allocation of resources in the global economy, and directly harms countries outside the agreement. It may, if severe enough, even hurt members. If trade diversion is not too severe, however, it may benefit members more than it hurt outsiders, so that the net effect on the world economy is positive (ERS/USDA, 1998).

Unfortunately, all of the potential problems described above are present in MERCOSUR and the Andean Community. These RTAs pose a tremendous treat for U.S. cotton exports to beneficiaries of the Caribbean Basin Initiative (CBI). Reason being, most of the CBI beneficiaries have additional trade agreements with MERCOSUR and the Andean Community. As a result, the U.S. can become comparably disadvantaged because of stiffer competition from supplies within the respective trading blocs. Consequently, U.S. cotton exports to the CBI beneficiaries can be diverted. This paper analyzes the effects these regional trade agreements have on CBI countries cotton imports from U.S. by calculating the associated trade creation and trade diversion values.

The remainder of this paper is structured as follows: Section II describes U.S.-CBI trade partnership; Section III provides the generalized framework of the import demand model; Section IV discusses data and estimation procedures; Section V provides the detailed steps in calculating trade creation and trade diversion; Section VI discusses the results; and Section VII provides conclusion of the study.

II: U.S. - CBI Partnership

The CBI plan was first announced by President Regan on February 24, 1982 and became effective on January 1, 1984. The central premise behind the plan was that, by encouraging the CBI countries to become more open and liberal, trade would expand – and eventually translate into economic development and growth (Deere1990). Today it is a general term used to refer to the Caribbean Basin Economic Recovery Act of 1983 (CBERA), the Caribbean Basin Economic Recovery Expansion Act of 1990 (CBERA Expansion Act), and the Caribbean Basin Trade Partnership of 2000 (CBTPA) (Ozden and Sharma 2006).

As of October, 2000, twenty four countries have been designated CBI beneficiaries : Antigua and Barbuda, Aruba, the Bahamas, Barbados, Belize, British Virgin Islands, Costa Rica, Dominica Islands, The Dominican Republic, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Montserrat, Netherlands Antilles, Nicaragua, Panama, St. Kitts-Nevis, St. Lucia, St. Vincent and the Grenadines, and Trinidad and Tobago. In this study, we will focus on the top eight CBI export markets for U.S. cotton, from 1989 - 2007: Bahamas, Barbados, Costa Rica, Guyana, Haiti, Jamaica, Panama, and Trinidad and Tobago.

The partnership between the U.S. and the CBI provides duty and quota free treatment for 1) textile and apparel products assembled from U.S. fabric in CBI beneficiary countries from U.S. fabric and 2) yarn and apparel assembled from CBI regional fabric, subject to a quantitative

limit which increases over time. The CBI will promote U.S. investment in the Caribbean Basin and help strengthen the international competitive position of the U.S. textile industry. These provisions are harbingers of success for U.S. cotton because they will induce increased U.S. exports of cotton fabric and yarn to the Caribbean and stimulate U.S. domestic consumption of fabric and thread for export.

Cotton is a major commodity for the U.S. generating about $4-5 billion in annual cash receipts (Dodson 1995). By value, cotton ranks fifth among agricultural commodities Furthermore, cotton is a major raw material for the textile and apparel industries creating heavy dependence by these industries on cotton production. The demand for raw fiber is derived from consumer demand for textile products where cotton is an important textile fiber (Marseli and Epperson, 2002). U.S. cotton exports to CBI countries over the past two decades have been fairly consistent. Following a trend of rapid growth in the early 1990s, there was a slight drop in the later part of that decade. However, there has been significant increase in the last two years.

The overall objective of this study is to analyze cotton trade among the CBI, MERCOSUR, and the Andean Community to determine effects of these RTAs on U.S. exports to the CBI. Specific objectives are to 1) examine factors influencing U.S. cotton exports to the CBI; 2) econometrically determine whether trade is created or diverted for U.S. cotton exports to the CBI.

III - Development of an Empirical Method

A CBI cotton import demand model was developed to estimate the effects of macroeconomic factors on U.S. cotton exports to the top eight CBI importing countries: Bahamas, Barbados, Costa Rica, Guyana, Haiti, Jamaica, Panama, and Trinidad and Tobago. Trade creation and diversion effects are calculated using the estimated demand elasticity with respect to import price.

CBI cotton imports are estimated as a function of real imported price of cotton; real GDP of importing countries; real exchange rates between U.S. and importing country; import tariff on cotton in importing country; and dummy variables for MERCOSUR and The Andean Community. The CBI import demand model for U.S. cotton is specified as:

$$\mathbf{QM_{it} = f\ (P_t, RGDP_{it}, RER_{it}, TAR_{it}, DMER, DAND)} \qquad \mathbf{(1)}$$

Assuming a linear relationship between the dependent and independent variables, the import demand model is estimated as follows:

$$\mathbf{QM_t = \alpha + \beta_1 P_t + \beta_2 RGDP_{it} + \beta_3\ RER_{it} + \beta_4 TAR_{it} + \beta_5 DMER + \beta_6 DAND} \qquad \mathbf{(2)}$$

Where α = intercept term

$\beta_{1\text{-}6}$ = partial effect of independent variables on $\mathbf{QM_t}$

$\mathbf{QM_t}$ = quantity of imports of U.S. cotton by top eight CBI importers in time **t**

$\mathbf{P_t}$ = price of U.S. cotton in time **t**

$\mathbf{RGDP_{it}}$ = real GDP in importing country **i** in time **t**

$\mathbf{RER_{it}}$ = real exchange rate between the U.S. and importing country in time **t**

$\mathbf{TAR_{it}}$ = import tariffs on U.S. cotton in country **i** in time **t**

DMER = dummy variable for MERCOSUR countries

DAND = dummy variable for the Andean Community members

Earlier studies that utilized similar import demand models, made the import value (price times quantity) the dependent variable. However, to remain consistent with economic theory the dependent variable in this study is the quantity of U.S. cotton imported. Prices used for this study are unit values for exports and imports, calculated by dividing the value of trade by the quantity of trade. From economic theory, price and quantity have a negative relationship. It is therefore expected that an increase in the price of cotton will result in a decrease in the quantity of cotton demanded/imported and vice versa.

According to Koo, Kamera, and Taylor (1994), the income (GDP) of exporting countries represents the country's production capacity, and the income of importing countries represents the country's purchasing power, both of which are positively related to trade flows. It is expected that an increase in income in the importing country will result in an increase in that country's imports of U.S. cotton. An increase in real GDP should increase imports, depending on how sensitive the consumption is to changes in income.

Bajpai and Mohanty (2008) argued that the exchange rate is arguably the single most important variable in determining the economic environment for trade sectors. In addition, Koo, Kamera, and Taylor (1994), asserted that exchange rate is one of the most important factors affecting trade flows. In this study, the exchange rate is a ratio of the CBI top importers' currency to the U.S. dollar. Economic theory predicts that U.S. exports will decrease when the U.S. dollar strengthens/appreciates relative to the currency of the importing country, and vice versa. Furthermore, as the U.S. dollar gains

strength U.S. exports become more expensive in the foreign market. Thus, it is expected that U.S. exports will have a negative relationship with the value of the U.S. dollar.

IV – Estimation procedures and Data

The import demand model used panel data for eight countries with annual observations from 1989-2007. A pooling technique, the process of combining cross-section and time series data, is used in the analysis.

U.S. cotton exports to CBI countries were obtained from the United States International Trade Commission (USITC) database. The prices were computed by dividing the value of imports by the quantity. The data are measured in U.S. dollars and are converted into real dollars for the analysis using the Consumer Price Index (CPI). Export data for MERCOSUR and the Andean Community were obtained from the UN COMTRADE database.

Real GDP data from each country were obtained from the International Monetary Fund's World Economic Outlook database. These data are converted to U.S. dollars to maintain a common unit of measure. Tariff data were obtained from the World Trade Organization (WTO) database. Tariff data for the Bahamas was unavailable so they were estimated.

The real exchange data between the U.S. dollar and each foreign currency were obtained from the Economic Research Service (ERS). These data are measured as the foreign currency per U.S. dollar, which means that an increase indicates appreciation of the U.S. dollar and a decrease means depreciation for the U.S. dollar.

V – Trade Creation and Trade Diversion

If tariffs between the U.S. and the Caribbean Basin Initiative are removed, trade

volume between the U.S. and the CBI will increase through trade creation and trade diversion effects. This study uses the Baldwin and Murray (1977) method the calculate trade creation effects:

$$\mathbf{TC = M\ e\ (\Delta t / (1 + t)} \qquad \mathbf{(3)}$$

Where **TC** = trade creation effect for imports of U.S. cotton by top eight CBI importers

M = average level of cotton imports for U.S.

e = import demand elasticity with respect to price

Δ**t** = changes in tariff

t = initial level of tariffs

The trade diversion effect is not easy to calculate, mainly because of difficulties in empirically estimating substitution elasticities between commodities produced by member countries and those produced by other countries. Baldwin and Murray (1977) estimated trade diversion effects using the following equation:

$$\mathbf{TD = TC\ (M_n / V)} \qquad \mathbf{(4)}$$

Where **TD** = trade diversion effect for imports of U.S. cotton by top eight CBI importers

$\mathbf{M_n}$ = average imports of cotton from non-member countries

V = domestic production by top eight CBI importers

Verdoorn (1960) provided an alternative method for estimating trade diversion:

$$\mathbf{5)\ TD = TC\ (M_n / M_t)} \qquad \mathbf{(5)}$$

Where $\mathbf{(M_n / M_t)}$ is the ratio of cotton imports from non-member countries to the country's total imports.

For empirical applications, the use of the Baldwin and Murray method requires domestic production which is frequently unavailable (Sawyer and Sprinkle, 1989). As a

result, the Verdoorn method has been more frequently used to compute trade diversion (Koo and Mattson, 2001). This study uses the Verdoorn method to calculate trade diversion effects.

(Koo and Mattson, 2001), computed trade expansion, which is the sum of trade creation and trade diversion effects using the demand elasticity with respect to tariffs (λ):

$$\mathbf{TE = TC + TD = M \lambda (\Delta t / t)} \qquad \mathbf{(6)}$$

Where **TE** is the total increase in trade resulting from elimination of tariff under the non-reciprocal trade arrangement.

Since the import demand elasticity with respect to import tariffs can be calculated form import demand models, **TE** is calculated using equation 6. The **TC** effect can be calculated by combining equations 5 and 6 as follows (Koo and Mattson, 2001):

$$\mathbf{TC = TE / [1 - (M_n / M_t)]}. \qquad \mathbf{(7)}$$

V – Results and Discussion

This section discusses the descriptive statistics (table 1) and the estimation results for the one-way fixed effect panel estimator (table 2). According to the F-statistics test we cannot ignore the cyclic and cross-sectional effects as the F-statistics for the one way FEM is significant at ($P < 0.0001$). Thus, the probability that there are no effects in the model is zero. The R^2 for the import demand model is 0.82, indicating that the model is a good fit. Table 2 presents

The own price elasticity of CBI cotton import demand is very inelastic (-0.545), indicating that CBI cotton imports from the U.S. are not sensitive to price changes; i.e. a one percent increase in the imported price of cotton would reduce CBI imports by 0.545 percent.

Real GDP in the top eight cotton importing CBI countries has a positive and significant effect on U.S. cotton exports. Thus, as income in these countries rises, so will their imports of U.S. cotton. The income elasticity of CBI import demand is extremely inelastic (0.0074), indicating that CBI cotton imports from the U.S. are also not sensitive to importers' income, i.e., a one percent increase in real GDP would result in only a 0.007 percent increase in CBI cotton imports. This inelastic demand can be explained by the fact that cotton is used for apparel/clothing which is a necessity. Koo and Mattson (2001) also concluded that U.S. agricultural exports to this hemisphere are positively influenced by real GDP in the importing country.

The results also show that tariffs have a negative but insignificant effect on U.S. cotton exports. These results were expected

The coefficient of the exchange rate variable in the model is negative and significant. This result supports the theory that the appreciation of the U.S. dollar relative to the currency of the importing country will have a negative effect on U.S. exports. In other words, as the U.S. dollar appreciates relative to the importing country's currency, U.S. exports to these countries become more expensive. Consequently, the importing country will be coerced to import less U.S. cotton. The exchange rate elasticity of CBI import demand is very elastic (5.73), indicating that CBI imports are very sensitive to the appreciation of the U.S. dollar; i.e., a one percent increase in the value of the U.S. dollar will result in a 5.73 percent decrease in imports by CBI countries. Koo and Mattson (2001) concurred and also concluded that U.S. agricultural exports are negatively influenced by the strength of the U.S. dollar.

The ANDEAN dummy variable in the import demand model was insignificant and did not provide any additional information in estimating the model. Conversely, the coefficient of the MERCOSUR dummy variable is negative and significant, which was expected. These results indicate that MERCOSUR has a negative impact on U.S. cotton exports to the CBI i.e., a one percent increase in cotton exports by MERCOSUR to the CBI would result in a 9.33 percent decrease in U.S. cotton exports to the CBI.

Trade Creation and Trade Diversion

Calculated trade creation, trade diversion, and trade expansion effects are shown in table 3. The elimination of tariffs by the eight CBI countries would increase U.S. cotton exports by $2.3 million. About 88 percent of the increased U.S. cotton exports are due to trade creation, and the remaining 12 percent is due to trade diversion.

The insignificant trade diversion effects on U.S. exports, indicates that MERCOSUR and the Andean Community pose an insubstantial treat to U.S. exports to the top eight importing CBI countries.

These results are congruent with the empirical findings of other researchers. Burfisher and Jones (1998), e.g., found that the regional free trade agreements have both trade creation and trade diversion effects in agriculture, but trade creation dominates in most regional agreements. This study finds that the trade creation effects of the U.S. – CBI agreement would be greater than the trade diversion effects of MERCOSUR and the Andean Community.

VI – Conclusions

This study indicates that U.S. cotton exports to the top eight importers area positively influenced by real GDP in the importing country and negatively influenced by

the imported price of cotton, the strength of the U.S. dollar (exchange rate), and tariffs in the importing countries.

Calculated CBI import demand elasticities indicate cotton imports are very insensitive to income/GDP and the import price of cotton. On the other hand, imports are very sensitive to the exchange rate.

The trade creation and trade diversion effects or tariff removals are analyzed. Trade creation effects are substantially greater than trade diversion effects. The favorable trade creation effects indicate that the U.S. - CBI agreement has been lucrative with respect to U.S. cotton exports to the region for the period 1989 – 2007. The insignificant trade diversion effects on U.S. cotton exports to the top eight CBI importers indicates that MERCOSUR and the ANDEAN Community has not significantly interfered with U.S. cotton imports to the CBI.

Table 1: Descriptive Statistics of Variable (N=152)

Variable	Units	Mean	Standard Deviation	Sum	Min	Max
Value of Imports	Actual $	3959643	7099997	601865770	54531	42115184
Exchange Rate	Ratio	6.57476	4.69334	999.36414	0.43914	21.57458
Per Capita GDP	Actual $	187870322	474107382	28556300000	612966	3050606174
Dummy Variable, MERCSOUR		0.63158	0.48397	96	0	1
Dummy Variable, ANDEAN		0.57237	0.49637	87	0	1
F Value= 18.09						
Pr > F=<.0001						

Table 2: Trade Creation, Trade Diversion, and Trade Expansion

Trade Creation			Trade Diversion		Trade Expansion
	Value	Percent %	Value	Percent	Value
$	2,000,000.00	88	$ 300,000.00	12	$ 2,300,000.00

Table 2: Results of the One-Way Fixed Effect Panel Estimation Procedure

Variable	Estimate	Standard Error	t Value	Pr > ltl
CS1	-1.74	1.3	-1.34	0.1838
CS2	-3.72	1.596	-2.33	0.0214
CS3	1.49	1.46	10.16	<.0001
CS4	-5.29	1.96	-2.7	0.0079
CS5	-9.16	1.42	-0.06	0.95
CS6	2.74	1.04	2.63	0.0095
CS7	3.28	1.25	2.63	0.0095
Intercept	5.28	1.94	2.72	0.0074
Dummy Variable, MERCSOUR	6.66	6.32	1.05	0.2938
Dummy Variable, ANDEAN	-5.79	2.23	-2.57	0.0111
Exchange Rate	-9.33	6.97	-1.34	0.1828
Per Capita GDP	0.0074	0.00129	5.76	<.0001
R^2	0.82			

Figure 1: U.S. Cotton Exports to Top Eight CBI Importers

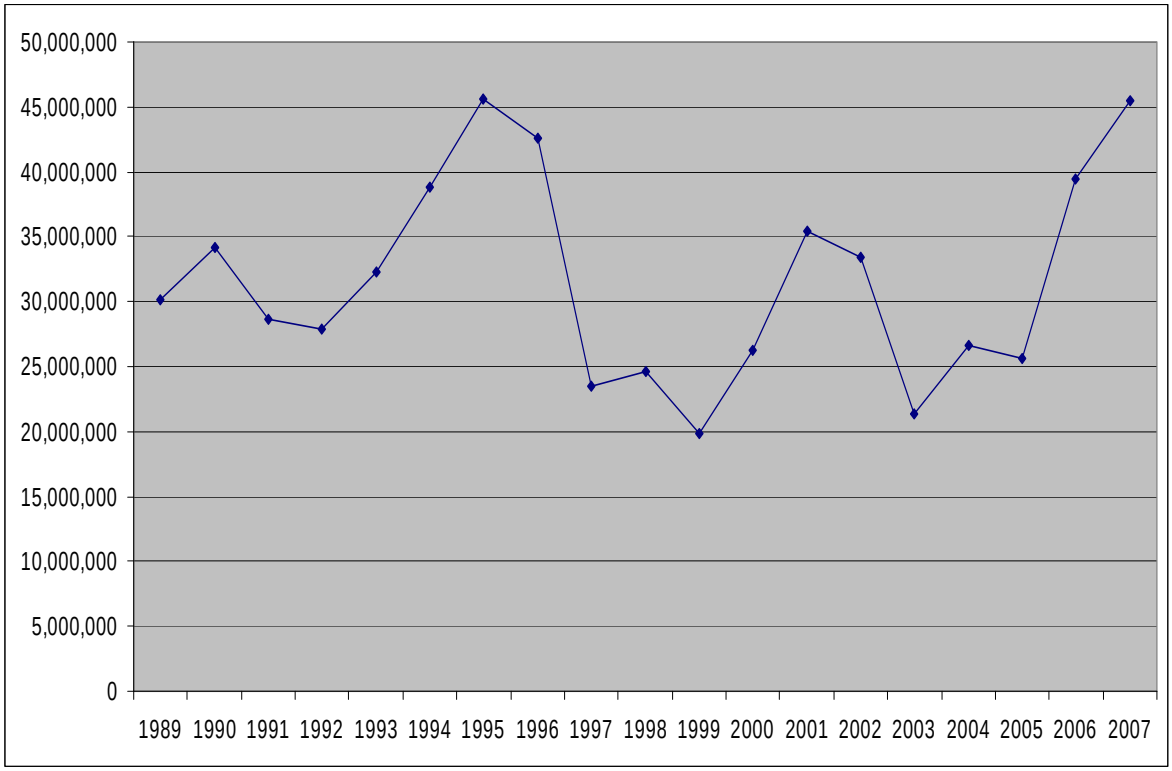


Figure 2: MERCOSUR Cotton Exports to the Top Eight CBI Importers

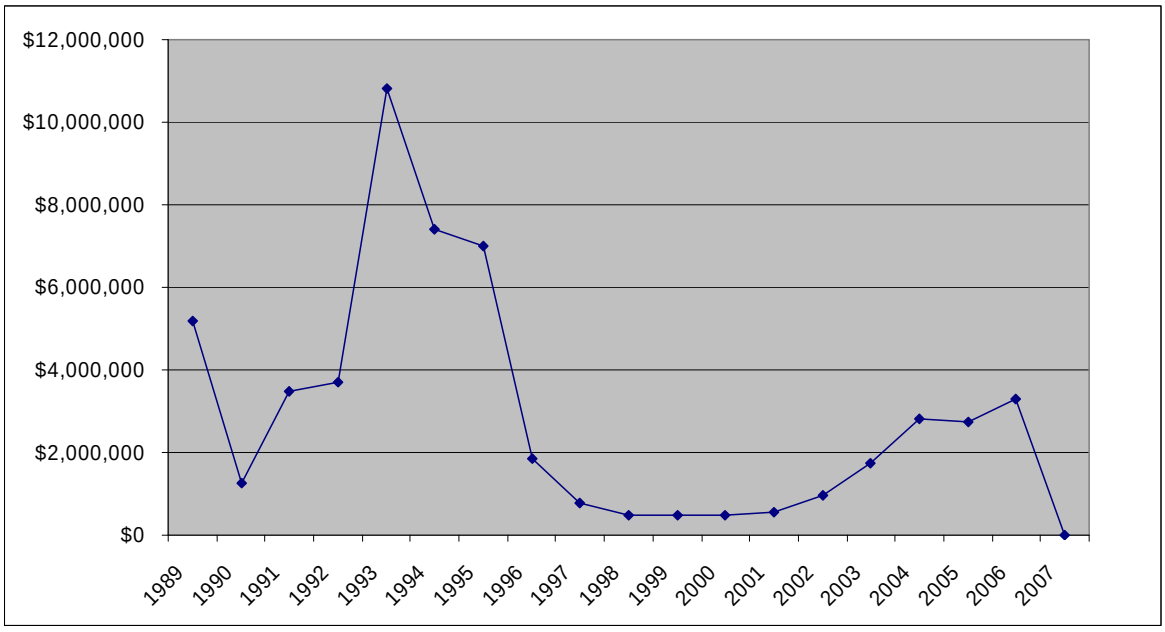
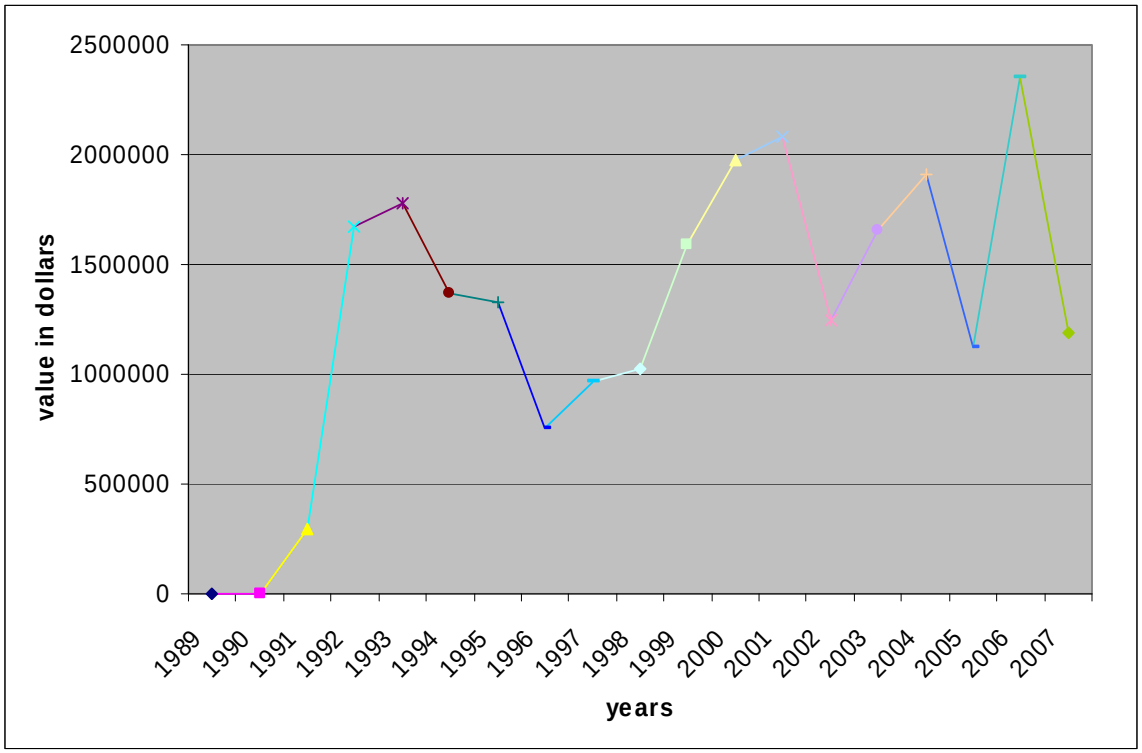


Figure 3: Andean's Community Cotton Exports to the Top Eight CBI Importers



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