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Market Power and United States Sectoral Textile Imports

Sheikh Shahnawaz[1]

ABSTRACT

This paper estimates US textiles import elasticities with 20 of its largest textiles exporters by utilizing cointegration methodology. The soon-to-be-implemented abolition of quotas on textiles makes the study of these import elasticities especially relevant to many developing countries particularly to those that have a significant textiles component in their exports. The study uses disaggregated data (4 digit ISIC) to separately consider seven textiles sub-sectors and calculates income and price elasticities for each one. While China appears to be in a position of significant market power in a majority of the textiles sub-sectors examined in this paper, the estimates also identify the particular sub-sectors in which the smaller textile exporters are in a position of some strength. Specifically, the carpets and rugs, and the apparels sectors are identified as those where smaller exporters have relatively more market power.

1. INTRODUCTION

HISTORICALLY, TEXTILES AND CLOTHING have played a unique role in economic development and poverty reduction. They were significant in the Industrial Revolution in Western Europe and North America in the eighteenth and nineteenth centuries and they continue to play an important role in many developing countries in the twentieth/twenty-first century.

Developing countries tend to have a strong comparative advantage in textiles because production technology requirements are simple. These countries have successfully used this advantage: in the mid-1960s, developing countries accounted for 15 percent of world textile exports and less than 25 percent of world clothing exports. Now, developing countries account for some 50 percent of world textile exports and 70 percent of world clothing exports. It is, therefore, not surprising that these countries have developed a high dependence on the textiles sector. For example, textiles alone accounted for 51 percent of Pakistan's merchandise exports while clothing accounted for 50 percent of Sri Lanka's. In the same year, textiles and clothing represented 83

percent of Bangladesh's merchandise exports and 83 percent of Cambodia's in the year 2000 (Geithner and Nankani, 2002).

Given this background, it is clear that formulating an informed commercial policy is crucial for these developing countries. To that end, this paper estimates import trade elasticities for the US with 20 of its largest textiles exporters.[2] This paper concentrates on only the US since it is the largest importing country of both textiles and clothing in the world. In 1997, US garment imports represented about 30 percent of world garment imports. The other big textiles market for developing country exports is the European Union, which is composed of other large importing countries. The issue takes on more immediate importance given the abolition in early 2005 of the Multi-Fibre Arrangement (MFA) of 1974 that expanded qualitative restrictions beyond the already-restricted cotton products to wool and man-made fibre products. Although this international agreement will phase out textile quotas under the Uruguay Round, a vast majority is currently in place. It is anticipated that the removal of these quotas is going to cause sharp adjustment pressures at the end of the implementation period in early 2005 since quotas have protected less competitive suppliers in both industrial and developing countries.

The US has also made use of the MFA, which limits the growth in the volume of imports from developing countries. This point is important for the empirical part of the paper. If quotas were unchanging over time, this would pose the problem of insufficient variation in the quantity variable. But at the time the quotas were introduced, the annual rates at which they would be allowed to grow in the future were also specified. Thus, the quantities grow annually at predetermined rates, giving the necessary variation in data. In general, small exporting countries have been granted more generous quota growth.

The US textiles sector has been called one of the most protected in the country (Scott and Lee, 1996). Even so, the pattern of the share of imports into the US textiles and apparel market has been the same as the pattern of the share of world exports of textiles and clothing from developing countries. Even as early as 1985, 33 percent of the US textiles market and 48 percent of the US apparel market was imported, shares that had more than doubled since 1975. In fact, there has been very fast growth in garment imports from Mexico to the US, which has been facilitated by the regional NAFTA agreement. The largest supplier of garments into the US market in 1999 was Mexico-$7.7 billion or 14.8 percent of the market-followed by China at $4.4 billion or a market share of 8.4 percent. The garment exports from Hong Kong equaled those of China, followed by Dominican Republic (4.5 percent of the market), Honduras (4.3 percent), Republic of Korea (4.1 percent), Taiwan (3.9 percent) and Bangladesh (3.4 percent).[3]

In the face of disappearing quotas, smaller exporters of textiles and clothing to the US can expect stiff competition from larger rivals, particularly

China and India. Since its accession to the WTO in December 2001, China's exports of textiles and clothing to the US have increased by 125 percent. Chinese exporters gained a greater share of the market by reducing their prices. Given these developments, it is crucial for the smaller exporters to have a comprehensive understanding of the implications of the said developments so that they can formulate effective policy in the increasingly competitive markets for textiles. In this regard, the US market is the most significant given its share in world textile imports. Trade elasticities computed in this paper are not only a first step in that direction but should also prove useful in later policy-oriented research that makes use of Computable General Equilibrium (CGE) models to investigate welfare effects of different policies.

2. The cointegration methodology

In the past, researchers have largely concentrated on estimating trade elasticities for aggregate trade. Examples include Kreinin (1967), Houthakker and Magee (1969), Khan (1974), and Bahmani-Oskooee (1986). The current study estimates import elasticities on a bilateral basis instead, which allows it to avoid what is known as the 'aggregation bias' problem. The elasticities are computed for US textiles imports from 20 of the largest textiles exporters to the US.

Previous evidence on bilateral trade elasticities for world trade consists of Armington (1970), Branson (1972), and Marquez (1990). However, Armington and Branson do not rely on statistical methods for parameter estimation while Marquez, who employs spectral analysis, suffers from inefficient results and the spurious regression problem. Bahmani-Oskooee and Brooks (1999) estimate bilateral trade elasticities for the US and its six largest trading partners using the Johansen and Juselius (1990) cointegration analysis while Marquez (2002) uses the same approach as well as Johansen (1988) to calculate trade elasticities for G-7 countries.

This study differs in terms of both its approach and context. Cointegration analysis is employed and the methodology comes from Johansen (1991), which builds on Johansen and Juselius. Also, this paper uses highly disaggregated data (4 digit ISIC) to estimate US import elasticities for seven textile sub-sectors. The ISIC codes and names for each of the sub-sectors are, 3211: spinning, weaving, and finishing textiles, 3212: manufacture of made-up textile goods except wearing apparel, 3213: knitting mills, 3214: manufacture of carpets and rugs, 3215: cordage rope and twine industries, 3219: manufacture of textiles not elsewhere classified, and 3220: manufacture of wearing apparel except footwear. Trade data come from the World Bank CD-ROM, 'A Dataset on Trade and Production, 1976-99.' GDP data for the US were obtained from the Federal Reserve Bank of St. Louis website. The index of import prices comes from the Bureau of Labor Statistics while the source for bilateral exchange rate data are the Penn World Tables. Inflation data for the US and 20 textile exporters included in this study was obtained

from the IMF's *International Financial Statistics.*

The analysis entailed estimation of elasticities for each of the 20 textiles exporters to the US listed above in each of the seven sub-sectors yielding a total of potentially 140 cointegrating relationships. However, a few countries were dropped from some of the sub-sectors due to insufficient data (11 cases). Also, there were some cases where no cointegrating relationships were found (37 cases). This reduced the number of estimated cointegrating vectors to 92. The emphasis on sub-sectors makes it easier to identify the textile sub-sector(s) where a particular country is in a position of relative market strength. Given the significant role that textiles play in developing country merchandise exports, this could enable the countries considered in this study to formulate targeted commercial policies.

The analysis uses the conventional treatment of trade flows as a function of real incomes and relative prices. Thus, the US import demand from trading partner i in textiles sub-sector j is assumed to take the following form:

$$LnM_{ij} = \alpha LnY + \beta LnRP_{ij} + \varepsilon \qquad (1)$$

Here, LnM_{ij} is the natural log of US real imports from trading partner i into sub-sector j, LnY is the natural log of US real GDP, and $LnRP_{ij}$ is the natural log of the real bilateral exchange rate between the US and trading partner i for sub-sector j. The latter is the closest substitute for a relative price term. This is required due to the unavailability of import prices on a bilateral basis that would be ideal to estimate bilateral trade elasticities. However, the real exchange rate as it is mentioned above is slightly different from the standard version in that US import price indices for textiles are used to calculate it rather than simply relying on an aggregate price index for the whole economy. Thus, we define RP as $\left(\frac{P^{US}_{textiles} E}{P_i}\right)$, where $P^{US}_{textiles}$ is the US import price index for textiles, E is the nominal bilateral exchange rate defined as number of country i's currency per dollar, and P_i is country i's GDP deflator. Given this definition, an increase in RP reflects a real depreciation of the currency of the trading partner from which the US is importing textiles. Thus, if a real appreciation of the dollar increases US imports, we would expect the estimate of β to be positive. By using RP as a measure of relative prices, we are able to measure the sensitivity of import demand to movements in the sector-specific real bilateral exchange rate. Dornbusch (1980) has previously used the real exchange rate in formulating the import demand function.

3. Empirical results

Prior to performing cointegration analysis, the data were plotted to see if a linear trend was present in the data-generating process. It did not appear to be the case. To confirm this, exclusion tests on specifications that included a

trend were conducted. These indicated that we could not reject restrictions that eliminate the trend from the cointegration space. Therefore, no trend was included.

Another issue addressed was the selection of the lag length. The study employed the versatile method advocated by Sims (1980) to select the appropriate lag length. The results were also found to be appropriate later when no evidence that errors were not white-noise was found -any evidence that errors are not white-noise is usually an indication that lag lengths are too short.
In applying the cointegration technique, we first need to determine the order of integration of each variable, which we did here by utilizing Choi's (1994) LM test for stationarity. Although not reported here, the results obtained allow us to proceed with the knowledge that all variables are non-stationary and are in fact first difference stationary.

Since the system delineated above could have up to three cointegrating vectors, the test statistics introduced by Johansen and Juselius (1990) for determining the number of cointegrating vectors are used. The two statistics are known as λ_{max} and *trace* and are reported for all of the 140 cases in Tables 1 through 7 for the null of no cointegrating vectors versus the alternative of one or more. Also, several tests were carried out to check if every parameter included in the system belonged to the cointegration space. If a parameter can be excluded from the cointegration space, it implies that it evolves independently of others. The hypothesis tests reveal that none of the variables can be omitted from the system.

The null of no cointegration was accepted for the following cases: Bangladesh, Guatemala, Mexico, Philippines, Sri Lanka, and South Korea in the Spinning, Weaving, and Finishing Textiles sector (six of the 20 exporters); Canada, China, Honduras, India, Italy, Malaysia, Mexico, Pakistan, Philippines, Sri Lanka, and Turkey in the Made-up Textile Goods Except Apparel Sector (11 of the 20 exporters); Canada, Honduras, Mexico, and South Korea in the Knitting Mills sector (four of the 20 exporters); India, Mexico, Philippines, and Turkey in the Carpets and Rugs sector (four of the 20 exporters); Honduras, Indonesia, Mexico, Philippines, and Sri Lanka in the Cordage Rope and Twine Industries sector (five of the 20 exporters); Bangladesh, China, Hong Kong, and Mexico in the Unclassified Textiles sector (four of the 20 exporters); and Mexico, Philippines, and Turkey in the Apparel sector (three of the 20 exporters). This is because either both or at least one of the test statistics was smaller than the critical value at the 95 percent level of significance. Relevant critical values at the 95 percent level of significance were 24.365 and 35.672 for the lmax and trace statistics respectively. Note that these critical values were adjusted for lag length, number of variables in the cointegrating space, and number of observations in accordance with Cheung and Lai (1993) and are not the same as their asymptotic analogs.

At least one cointegrating vector is implied by the results for the remainder of the cases. In some cases, there are even two cointegrating vec-

tors. King, *et al.* (1991) explain the presence of more than one vector as a consequence of different economic theories dominating different relationships among a set of variables. In our case, the import demand function could, on the one hand, signify the import demand equation, while on the other hand, could imply an exchange rate equation in which imports and income are the determinants of the sectoral real exchange rate. In such cases, the vector is chosen based on expected signs of estimated coefficients as suggested by the appropriate theory. Thus, the reported vectors are those that best match theory. This means that, while most coefficients indeed have the expected signs, some do not. Estimates are presented in Tables 1 through 7. All vectors are normalized on *LnM* by setting its coefficient to -1 so that elasticities can be read easily.

While we are able to report estimates with expected signs for most of the 92 cases for which results are reported, there are 24 cases where the income elasticity and 16 cases where the price elasticity is negative instead of the expected positive. It should be noted, however, that most of these negative income elasticities are very low in absolute terms and mostly fairly close to zero. Countries with these negative income elasticities could be suffering from a loss of the US market given the increase in competition from other countries.

Table 1: Income and Price Elasticities in the Spinning, Weaving, and Finishing Textiles Sector (ISIC Classification 3211)

	LnM	LnY_{US}	*LnRelP*	*Trace*	λ_{max}
Bangladesh	-	-	-	23.84	15.51
Canada	-1.00	0.83	8.04	38.48	24.71
China	-1.00	0.59	0.71	52.76	29.42
Costa Rica	-1.00	0.27	0.78	50.12	42.00
Dominican Republic	-1.00	-0.78	11.93	62.42	49.57
Guatemala	-	-	-	30.96	23.97
Hong Kong	-1.00	0.57	0.77	46.32	33.97
Honduras	-1.00	0.33	1.36	60.46	32.69
India	-1.00	0.55	0.82	41.17	19.76
Indonesia	-1.00	-0.32	3.03	49.72	29.15
Italy	-	-	-	35.27	21.00
South Korea	-	-	-	28.29	20.75
Malaysia	-1.00	0.43	5.05	52.33	30.02
Mexico	-	-	-	34.95	18.86
Pakistan	-1.00	0.36	1.79	38.89	30.20
Philippines	-	-	-	30.90	16.60
Sri Lanka	-	-	-	34.36	23.84
Taiwan	-1.00	0.75	-1.00	63.04	48.25
Thailand	-1.00	0.74	-0.61	66.89	48.47
Turkey	-1.00	-0.44	1.66	70.27	55.46

In the Spinning, Weaving, and Finishing Textiles sector, three income elasticities are negative, while the remainder range from 0.27 and 0.83. Four income elasticities are between 0.1 and 0.5 and five are above 0.5. All of the income elasticities in this sector lie below unity, which is characteristic of developing countries. China and India have income elasticities of 0.59 and 0.55 in this sector.

The estimates for income elasticities in Manufacture of Made-up Textile Goods Except Wearing Apparel could not be estimated for most countries since no cointegration relationship could be detected in 11 cases. The ones that were estimated are again mostly below one. Other than the three negative elasticities, there are three that are between 0.1 and 0.5, one is between 0.5 and 1.0, and two are above 1.0. The six positive elasticities range from 0.14 to 2.57. Bangladesh, with an income elasticity of 2.57, and Thailand with an elasticity of 1.12 appear to have an edge over the other exporters in this sector.

Table 2: Income and Price Elasticities in the Manufacture of Made-up Textile Goods Except Apparel Sector (ISIC Classification 3212)

	LnM	LnY_{US}	*LnRelP*	*Trace*	λ_{max}
Bangladesh	-1.00	2.57	-14.60	38.99	33.79
Canada	-	-	-	35.32	23.05
China	-	-	-	30.48	19.25
Costa Rica	-1.00	-1.13	7.16	42.61	30.71
Dominican Republic	-1.00	0.31	1.49	39.78	32.15
Guatemala	-1.00	0.14	3.47	36.16	17.56
Hong Kong	-1.00	0.56	0.58	39.57	21.49
Honduras	-	-	-	27.52	21.44
India	-	-	-	29.09	19.19
Indonesia	-1.00	-0.85	4.80	37.12	23.93
Italy	-	-	-	25.47	14.66
South Korea	-1.00	-0.69	5.75	46.50	32.55
Malaysia	-	-	-	25.04	15.04
Mexico	-	-	-	26.64	15.35
Pakistan	-	-	-	33.08	17.28
Philippines	-	-	-	23.73	12.95
Sri Lanka	-	-	-	30.84	19.24
Taiwan	-1.00	0.14	4.56	75.77	50.58
Thailand	-1.00	1.12	-4.89	51.07	33.11
Turkey	-	-	-	24.45	15.50

The Knitting Mills sector has five negative income elasticities, three that are between 0.1 and 0.5, six that are between 0.5 and 1.0, and only one is above unity. The range of the positive elasticities is 0.10 to 3.20.

In the Manufacture of Carpets and Rugs sector, six income elasticities are negative with the positive elasticities ranging from 0.01 to 0.63. None of the income elasticities in this sector are above unity.

Table 3: Income and Price Elasticities in the Knitting Mills Sector (ISIC Classification 3213)

	LnM	LnY_{US}	*LnRelP*	*Trace*	λ_{max}
Bangladesh	-1.00	3.20	-18.47	50.91	27.09
Canada	-	-	-	30.92	20.58
China	-1.00	0.59	0.95	43.92	30.43
Costa Rica	-1.00	-0.35	4.68	80.43	71.87
Dominican Republic	-1.00	0.46	0.60	58.87	39.78
Guatemala	-1.00	-0.06	7.34	47.10	39.86
Hong Kong	-1.00	0.68	0.23	56.83	33.18
Honduras	-	-	-	34.29	22.45
India	-1.00	0.10	3.69	37.71	23.50
Indonesia	-1.00	-0.33	3.11	52.50	25.80
Italy	-1.00	0.91	-1.08	53.04	30.30
South Korea	-	-	-	30.24	17.24
Malaysia	-1.00	0.42	4.94	39.03	21.69
Mexico	-	-	-	24.87	13.95
Pakistan	-1.00	-0.40	7.90	46.61	28.79
Philippines	-1.00	0.60	-0.11	43.39	33.89
Sri Lanka	-1.00	0.68	-0.81	52.12	41.83
Taiwan	-1.00	0.67	0.31	47.57	22.96
Thailand	-1.00	0.98	-2.85	36.40	22.71
Turkey	-1.00	-0.15	1.72	41.49	31.13

Cordage, Rope, and Twine Industries has only one negative income elasticity with the remainder being less than one with one exception. In fact, other than Bangladesh, all of the positive income elasticities are below 0.6.

Textiles that are not classified in the other six sectors examined in this paper have only three negative income elasticities with none being more than 0.80.

In the last sector, namely, Manufacture of Wearing Apparel, three elasticities are negative, five are between 0.1 and 0.5, seven between 0.5 and 1.0, and two are above unity. Bangladesh with an income elasticity of 1.38 and Italy with an elasticity of 1.05, seem to be in a position of relative strength. Note that China and India have income elasticities of 0.71 and 0.51 respectively, in this sector.

Table 4: Income and Price Elasticities in the Manufacture of Carpets and Rugs Sector (ISIC Classification 3214)

	LnM	LnY_{US}	*LnRelP*	*Trace*	λ_{max}
Bangladesh	-1.00	-0.93	9.30	48.81	44.31
Canada	-1.00	0.41	6.70	43.15	26.85
China	-1.00	0.63	0.20	39.65	25.41
Costa Rica	-1.00	-1.05	7.21	52.57	39.00
Dominican Republic	-	-	-	52.99	35.31
Guatemala	-1.00	0.04	4.23	36.46	20.89
Hong Kong	-1.00	0.12	4.51	42.81	25.10
Honduras	-	-	-	28.50	14.45
India	-	-	-	31.87	16.91
Indonesia	-1.00	-2.14	8.58	41.52	33.19
Italy	-1.00	-0.32	3.36	38.12	24.94
South Korea	-1.00	0.01	0.78	41.42	21.28
Malaysia	-	-	-	35.31	22.88
Mexico	-	-	-	23.41	12.71
Pakistan	-1.00	0.47	1.03	35.92	23.74
Philippines	-	-	-	33.64	16.04
Sri Lanka	-1.00	-0.64	5.03	33.54	25.82
Taiwan	-1.00	0.44	0.20	46.39	26.33
Thailand	-1.00	-0.96	11.86	48.60	34.01
Turkey	-	-	-	28.90	17.14

The results for price elasticities are not as closely clustered together as the results for income elasticities just discussed. In the Spinning, Weaving, and Finishing Textiles sector, two price elasticities are negative while 11 are positive. Although many price elasticities are below unity, including those of China (0.71) and India (0.82), there are seven that are above one. Included among these are the Dominican Republic (11.93), Canada (8.04), and Malaysia (5.05). Two of the estimated price elasticities in the Manufacture of Made-up Textile Goods Except Wearing Apparel sector turn out to be negative, with only one of the remaining estimates below unity. All other elasticities in this sector were more than one. Knitting Mills have five negative price elasticities and four that are below unity. It is interesting to note that among these are China, Hong Kong, and Taiwan. Again, the remaining price elasticities are above unity and are as high as 7.90 for Pakistan. None of the price elasticities estimated for Manufacture of Carpets and Rugs were negative and three were below one. China and Taiwan were again among the list of countries with price elasticities below one. Thailand (11.86) has the highest price elasticity.

Table 5: Income and Price Elasticities in the Cordage, Rope, and Twine Sector (ISIC Classification 3215)

	LnM	LnY_{US}	*LnRelP*	*Trace*	λ_{max}
Bangladesh	-1.00	4.13	-25.17	74.12	67.24
Canada	-1.00	0.40	0.26	39.77	24.80
China	-1.00	0.40	6.31	42.73	29.05
Costa Rica	-1.00	-3.75	19.48	60.59	52.71
Dominican Republic	-	-	-	53.33	47.08
Guatemala	-	-	-	58.56	38.33
Hong Kong	-1.00	0.40	-0.64	36.26	24.56
Honduras	-	-	-	25.84	17.09
India	-1.00	0.24	1.60	40.96	24.65
Indonesia	-	-	-	29.42	17.00
Italy	-1.00	0.45	0.03	48.04	28.43
South Korea	-1.00	0.47	0.33	37.72	22.73
Malaysia	-	-	-	42.23	33.69
Mexico	-	-	-	25.33	14.12
Pakistan	-	-	-	30.13	14.134
Philippines	-	-	-	26.74	17.73
Sri Lanka	-	-	-	29.86	19.13
Taiwan	-1.00	0.56	-0.08	76.08	56.70
Thailand	-1.00	0.20	2.55	45.06	28.70
Turkey	-	-	-	16.71	10.02

Table 6: Income and Price Elasticities in the Manufacture of Textiles Not Elsewhere Classified Sector (ISIC Classification 3219)

	LnM	LnY_{US}	*LnRelP*	*Trace*	λ_{max}
Bangladesh	-	-	-	29.94	21.48
Canada	-1.00	0.41	7.89	45.92	26.28
China	-	-	-	32.12	14.38
Costa Rica	-1.00	0.41	0.76	61.73	45.17
Dominican Republic	-1.00	0.29	1.17	58.97	36.97
Guatemala	-1.00	0.09	2.93	102.00	54.94
Hong Kong	-	-	-	33.86	23.50
Honduras	-1.00	0.35	3.65	53.96	36.17
India	-1.00	0.02	4.22	40.42	20.70
Indonesia	-	-	-	40.93	31.95
Italy	-1.00	0.80	-0.87	60.85	41.56
South Korea	-1.00	-0.24	2.68	37.73	19.41

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Malaysia	-1.00	0.06	3.18	63.99	47.12
Mexico	-	-	-	33.29	20.83
Pakistan	-1.00	-1.24	13.52	39.03	27.88
Philippines	-1.00	-0.56	7.05	36.47	20.07
Sri Lanka	-	-	-	52.14	41.00
Taiwan	-1.00	0.09	3.89	53.10	28.35
Thailand	-1.00	0.78	-2.56	49.40	32.10
Turkey	-	-	-	16.29	9.03

In the Cordage, Rope, and Twine sector, apart from three negative elasticities, there are three positive elasticities below one. This is the only sector in which China has an elasticity of above unity (6.31). Only one of the positive price elasticities is below unity in the sector which is constituted of textiles not classified elsewhere. Finally, in the Apparels sector, four price elasticities lie

Table 7: Income and Price Elasticities in the Manufacture of Wearing Apparel Sector (ISIC Classification 3220)

	LnM	LnY_{US}	*LnRelP*	*Trace*	λ_{max}
Bangladesh	-1.00	1.38	-5.14	76.61	55.01
Canada	-1.00	0.15	21.68	56.85	44.71
China	-1.00	0.71	0.76	39.35	22.54
Costa Rica	-1.00	-0.31	4.97	79.23	59.81
Dominican Republic	-1.00	0.36	0.20	72.08	46.41
Guatemala	-1.00	0.22	5.19	72.44	43.10
Hong Kong	-1.00	0.64	1.02	48.23	25.26
Honduras	-1.00	0.53	1.16	36.33	19.39
India	-1.00	0.51	1.40	40.48	23.75
Indonesia	-1.00	0.20	1.72	100.20	74.47
Italy	-1.00	1.05	-1.43	83.86	44.14
South Korea	-1.00	-0.64	5.78	43.76	31.42
Malaysia	-1.00	0.54	1.77	53.80	23.27
Mexico	-	-	-	26.33	13.52
Pakistan	-1.00	-0.09	5.42	54.19	27.72
Philippines	-	-	-	34.63	20.84
Sri Lanka	-1.00	0.66	0.85	40.43	24.57
Taiwan	-1.00	0.61	0.75	71.57	45.57
Thailand	-1.00	0.16	6.61	47.49	34.50
Turkey	-	-	-	32.09	22.37

below one, including that of China. While price elasticities for India in all but the Spinning, Weaving, and Finishing Textiles sector are above one, most of these are barely over 1.5. The highest, 4.22, is in the Unclassified Textiles sector. Note also that the dispersion of these elasticities is not uniform across countries with Bangladesh exhibiting the highest dispersion. Most countries exhibit a fairly narrow dispersion of elasticity estimates.

4. IMPLICATIONS

While most of the income elasticities estimated in this paper are below unity, price elasticities show much more variation and several lie well above one. This points toward a substantial responsiveness to prices of textile imports into the US. This holds especially true for smaller exporters of textiles to the US as compared to China and India, both of whom have been identified by trade specialists as likely to be major forces in the textile trade in the future. Economies of scale give them advantage over less competitive exporters. Although the majority of the price elasticities estimated for China tend to be below one, those for India are consistently higher than one with the highest being 4.22 in the unclassified textiles sector. In fact, many of these elasticities for India turn out to be comparable to several smaller exporters. For example, India's price elasticity: 1) in the Knitting Mills sector is higher than those of Indonesia and Turkey; and 2) in the unclassified textiles sector is higher than those of Costa Rica, Guatemala, and Malaysia. This suggests that India is positioned similarly to many of its smaller textile-exporting rivals.

As mentioned before, the analysis in this paper was performed with a somewhat different definition of the real exchange rate, i.e., prices in the US textiles sector were used in place of the general US price level. To examine the sensitivity of this approach, elasticities were re-computed using the general price level instead of textiles prices. In this case, the results were more in line with those reported in previous literature, which is characterized by estimates for demand elasticities that rarely exceed three. The widely cited survey by Goldstein and Khan (1985) reports the estimates of the elasticity of demand, facing the exports of small countries like Austria, Belgium and Denmark, as uniformly less than 1.6.

Many of the estimates obtained in this paper are significantly higher than three and are as high as 21.68. One recent paper that does determine demand elasticities to be high is Panagariya, *et al.* (2001). The study estimates the US demand for the products imported from Bangladesh under the Multi-Fibre Arrangement and finds the price elasticity of demand to be consistently high. In the case reported in their study, the estimate of the elasticity is 26. In other unreported cases, it is claimed to be even higher. One common feature between the present study and the one conducted by Panagariya, *et al.* (2001) is the use of data with a high degree of disaggregation. This could be one explanation for our high price elasticity values. However, the sensitivity analysis performed here points toward another explanation: rather than

the disaggregated nature of the data, it could be the choice of a sector-specific price index that yields high elasticity estimates. Much of our estimation results produced with sector-specific prices support the theoretical view that small countries have large import demand elasticities. Influential papers with this outlook are Riedel (1988) and Athukorala and Riedel (1991). This match with theory, therefore, supports the use of sector-specific prices in determining trade elasticities.

One important implication of these results is again discussed in Panagariya, *et al.* (2001) Low demand elasticity estimates undermine the case for unilateral trade liberalization in small countries. The estimates imply considerable market power on the part of these countries and even make unilateral liberalization by them a welfare-reducing proposition beyond a certain point. In addition, low estimates raise doubts about exports serving as the engine of growth. This is because even after we account for higher demand due to income growth, if price elasticities are as low as is suggested by the low estimates, a 20 percent per annum expansion of a country's exports is bound to worsen its terms of trade substantially. This point takes on special importance given our low estimates of income elasticity. Also, these low elasticities cannot be reconciled with the rapid growth of East Asian exports that took place in recent decades at relatively stable terms of trade.

While China does seem to have significant market power in most of the sub-sectors, we are able to identify other countries that also share this position. For instance, in the Spinning, Weaving, and Finishing textiles sector, India, Hong Kong, and Costa Rica also show considerable market power.

Hong Kong's position is fairly unique in the Made-Up Textiles Except Wearing Apparel sector where it shows signs of market power. Other exporters in this sector demonstrate significant price responsiveness. China, along with Hong Kong, Taiwan, and the Dominican Republic has considerable market power in the Knitting Mills sector.

In the Carpets and Rugs sector, while China is in a very strong position together with South Korea and Taiwan, traditional rug manufacturers like Pakistan also demonstrate some market power. In the Rope and Twine industry, China is not in a position of considerable market power. It is Italy and Canada that hold positions of strength in this sector with South Korea not lagging far behind. Costa Rica is in the forefront in the Unclassified Textiles sector.

Finally, in the apparels sector, while China, Taiwan, Sri Lanka, and the Dominican Republic all have strong market positions, there are several exporters that also hold position of reasonable strength. Although many exporters do have price elasticities above unity in this sector, they do not exceed one significantly. Thus, in accordance with the views held by many trade and textiles sector analysts, major exporters to the US of smaller size hold most market power in the textiles sector. In addition, our study also identifies the Carpets and Rugs sector as a potential market where smaller

exporters hold competitive positions. It should also be noted that while China and India have significant market power in the Spinning, Weaving, and Finishing Textiles sector, several smaller exporters cannot be discounted and are very much in the game for some part of this market in the US.

5. Conclusion

This paper has offered estimates of price and income elasticities for twenty of the biggest textiles exporters to the US. While most of the income elasticities reported are below one, estimates for price elasticities afford some interesting insights into the level of market power held by particular countries in the seven textiles sub-sectors examined in this paper. Using highly disaggregated data and employing cointegration analysis, the paper confirms China as having substantial market power in almost all of the textiles sub-sectors. However, the study also identifies the sub-sectors in which many of the smaller exporters have substantial market power. While the level of price responsiveness is quite high for many small exporters in most sub-sectors, the Carpets and Rugs sector and the Apparels industry hold the most promise for small exporters in the post-quota removal environment.

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Endnotes

1. Department of Economics, California State University, Fullerton, CA 92834, USA. E-mail: birooni@yahoo.com. I gratefully acknowledge valuable comments on earlier versions of the paper from Jeff Nugent and Anita Chaudhry and an anonymous referee.

2. The 20 exporters considered are Bangladesh, Canada, China, Costa Rica, Dominican Republic, Guatemala, Hong Kong, Honduras, India, Indonesia, Italy, South Korea, Malaysia, Mexico, Pakistan, Philippines, Sri Lanka, Taiwan, Thailand, and Turkey.

3. International Trade Center.

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