



Global Sourcing and Textile and Apparel Import Values: A Four-Country Study as an Application of Global Commodity Chains Theory

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ABSTRACT

The authors use Gerrefi's (1999) Global Commodity Chains Theory to guide examination of U.S. textile and apparel imports from four countries including Hong Kong, South Korea, Bangladesh, and Italy. These four countries represent different developmental stages and hold varying export positions in the buyer-driven apparel commodity chain. Unit values of U.S. apparel and textile imports are estimated using OTEXA trade data (1999-2001). Data analyses suggest conformity between Gereffetti's theory and differences in unit values among countries with different export positions.

Keywords: Global sourcing, Global Commodity Chain, Export positions, Unit value

INTRODUCTION

In today's economy, conventional industrial/market boundaries between countries are disappearing. Because factor costs vary widely across nations, firms can take advantage of these differences by locating value chain activities in countries that offer comparative advantage in factors of interest (Kogut, 1985). In Ricardo's comparative advantage theory, countries import products for which they have comparative factor disadvantages and export products for which they have factor-based comparative advantages (Hollander, 1979). Ricardian theory has been recently advanced by business strategist Michael Porter (1990), who notes that "firms with truly global strategies compete by selling worldwide, sourcing components and materials worldwide, and locating activities in many

J nations to take advantage of low cost factors" (p.14).

T Sourcing is defined as the process of A determining how and where manufactured goods or components will be procured. T Global sourcing means having production M and/or assembly performed in countries outside of a company's home market (Dickerson, 1995, p.294). The major force driving global sourcing is the need to create higher value for end-users by reducing production costs. In fact, dispersing particular activities across the transnational value chain to lower costs and gain competitive advantage is considered as a successful global business strategy. As a result, global sourcing in the U.S. market is continuously increasing. U.S. apparel imports doubled between 1990 and 1998, from \$24.7 to \$50.4 billion (Gereffi, 2001).

The retail industry is at the forefront of the global sourcing trend. According to analysts (Dowing, 2002), leading retailers in developed countries, such as Wal-Mart, and Carrefour, depend heavily upon overseas manufacturers as their source of merchandise. Even in cases that retailers do not take part in manufacturing, they are able to use global sourcing networks to coordinate manufacturing in various countries (Bonacich et al., 1994). Branded manufacturers including Liz Claiborne and Nike do not own their factories but use manufacturing partners to produce apparel products under their respective name brands.

During the 1990s, Gereffi (1994, 1999, 2000) developed his *Global Commodity Chain* theory, which explains the restructuring of the global retail industry. He defines the commodity chain as "the range of activities involved in the design, production, and marketing of a product" (Gereffi, 1999, p.38). Gereffi identifies two types of global commodity chains: producer-driven and buyer-driven.

The textile and apparel industry is characterized as a buyer-driven commodity chain, in which retailers and branded marketers play lead roles rather than manufacturers. Without assuming ownership of manufacturing, retailers and brand marketers are able to coordinate a global supply network and capture substantial portions of the value chain (Craig & Douglas, 1997; Krishna, Erzan, & Tan, 1994). Lead firms in the buyer-driven commodity chain tend to have core competencies in understanding end-user preferences, designing products, forming cost-efficient global sourcing networks, and selling finished products with the right distribution plan. In addition, they are able to administer global sourcing networks by using technology and financial resources (Christerson, 1994; Gereffi, 1994).

The Buyer-Driven Apparel Commodity Chain and Export Positions

Apparel production is one of the most globalized activities in the world economy (Christerson & Appelbaum, 1995). Because

the apparel production process of cutting, trimming, and sewing is difficult to mechanize, apparel represents a highly labor-intensive industry (Cline, 1994). The labor-intensive nature of apparel production has prompted growth of international production and trade networks seeking economic efficiency. Presently, production of apparel occurs in *vertically disintegrated subcontracting networks* (Christerson & Appelbaum, 1995, p.1363) of the global commodity chain (Gereffi, 1994, 1999).

The literature on international economics and trade practice identifies three export positions within the global apparel commodity chain: mere-assembly manufacturing, original equipment manufacturing (OEM), and original brand name manufacturing (OBM) (Christerson & Appelbaum, 1995; Gereffi, 1996, 1999). In the global apparel commodity chain, countries are linked by assuming different roles in supplying apparel products to the world markets (Gereffi, 1999). The export position of a country within the global apparel commodity chain is likely to be determined by the available resources and capabilities accumulated by that country's apparel industry over the course of industry development (Porter, 1998).

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Resources and capabilities that permit a particular country to take a more profitable position within the apparel commodity chain include not only labor factors and physical, financial resources, but also relationship-based assets and marketing-based assets such as brand names (Madhok, 1996). Countries that possess such resources and capabilities are, therefore, likely to develop advanced competitive advantages beyond offering a low-cost product, and can command high values in world markets (Lee & Kwon, 2001; Porter, 1990).

At the other end of the buyer-driven apparel commodity chain are less developed countries (LDCs). Workers in less developed countries dye, cut, trim, and sew apparel products, following the specifications given by foreign lead firms in the apparel commodity chain. Because less developed countries have abundant labor,

but have limited capital and technology, they assume a labor-intensive position and manufacture ready-made clothing as subcontractors.

Export Positions

Mere Assembly. Mere-assembly based exports in the apparel commodity chain refer to the "export-oriented assembly of traditional manufactured goods using imported components" (Gereffi, 1996, p.84). This type of export includes basic assembly of imported inputs for export, which requires minimal forward and backward linkages. Assembly-based exports compete solely on low cost labor, and thus tend to be the least profitable and least sustainable export position (Campbell & Parisotto, 1995).

Original Equipment Manufacturing. Original equipment manufacturing (OEM) based exports refers to the manufacturing of apparel products by contractors to be sold (in developed countries) under another company's brand name. Firms that engage in OEM-based exports have technical skills; however, marketing and distribution capabilities are not developed to the extent to which they can design and market apparel products to sophisticated end-user consumers.

Original Brand Name Manufacturing. Original brand name manufacturers are capable of integrating product design, marketing, retailing, and manufacturing functions within their inter- or intra-firm networks and export under their own brand names (Gereffi, 1996, 1997).

Export Positions and Product Import Values

Porter (1990) suggests that firms should not accept basic factor disadvantages, and notes that sources of sustainable competitive advantage extend beyond basic factor advantages to include branding and marketing capabilities. The objective of branding and marketing includes creation of superior customer value which can lead to premium prices/profits, or so-called "rents"

in economics. According to Kaplinsky (1998) and Dyer and Singh (1998), economic rents can be defined as supernormal profits generated from scarce assets. According to the resource-based view of strategic management, scarce assets that enable economic rents, may include firms' resources and capabilities (Porter, 1990), as well as fixed assets such as land and factories (Amit & Schoemaker, 1993). Countries in the global apparel commodity chain use different kinds of barriers to entry that can generate economic "rents" in the transnational value chain.

The types of rents used as barriers of entry to the apparel commodity chain include trade-policy rents, relational rents, and brand name rents (Kaplinsky, 1998). Trade-policy rents are created by protective trade policies such as quantitative restrictions (QRs) on textile and apparel imports. Relational rents refer to value added through supply chain management, the formation of strategic alliances, or the clustering of firms for collective efficiency (Dyer & Singh, 1998; Kaplinsky, 1998). Brand name rents are created through highly differentiated products with unique brand names in the world apparel markets (Dyer & Singh, 1998; Madhok, 1996).

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Then, what is the relationship between export positions within the buyer-driven apparel commodity chain and product value? Earlier, it was suggested that export positions within the apparel commodity chain are determined by the available resources and capabilities that a particular country has acquired through the course of industry development. Original brand name exporters can enjoy the highest level of relational rents and brand name rents. Original brand name manufacturers can organize transnational supply chain networks, using financial resources and telecommunication technologies for cost-efficient production (relational rents). Additionally, their core competencies include differentiated apparel products with original brand names. Since consumers will pay premium prices for well-known brand names, original brand name manufacturers can add value by producing branded apparel.

Countries engaging in OEM may possess the infrastructure, assets, and semi-skilled labor to produce quality apparel and textile products. In addition, there are spillover effects regarding the transfer of foreign skills and managerial practices via OEM. Through supply relationships with overseas sourcing partners, relational rents can be generated. However, original equipment manufacturers cannot enjoy brand name rents, because products are developed and sold under other companies' brand names.

Countries engaging in mere-assembly get minimal support from supporting industries in the forward and backward linkages (Gereffi, 1999). Though they may have sourcing partner-ships, the governance structure of the value chain allows mere-assemblers minimal profits. It is unlikely that mere-assembly countries create value from relational or brand name rents.

Research Hypotheses: Comparing Unit Values

The current research compares the export positions of four countries in the global commodity chain—Hong Kong, South Korea, Bangladesh, and Italy—by examining the unit values of their textile and apparel exports to the U.S. These countries were selected because they are the world's major suppliers of apparel and textiles products and they hold varying positions in the global apparel commodity chain. The following sections briefly trace the development and progress of the economy and the apparel industry for Hong Kong, South Korea, Bangladesh, and Italy.

Hong Kong. Hong Kong has been vigorously developing its manufacturing sector since the 1950s. Apparel is the foremost manufacturing sector, generating the largest export values and employment in the Hong Kong economy (Lau & Chan, 1994). Hong Kong was the world's top apparel exporting country from 1973 to 1977. In the early 1980s, Hong Kong topped the world's apparel exports before it yielded this position to Italy in 1986 (Lau &

Chan, 1994). Hong Kong is currently the world's second largest exporter of textiles ("Hong Kong's Textiles industry," 2000). According to Li and Yao (2001), exports to U.S. increased by 7.8% between 1992 and 1998. During the 1980's average real monthly earnings increased by 60% (Fields, 1994), which negatively affected its reliance on cost competition. In the late 1980s, Hong Kong moved production to China, and has begun to focus on fashionable, high-priced apparel products (Lau & Chan, 1994). Although Hong Kong's major form of apparel exports to the U.S. is OEM-based, Hong Kong began its shift from OEM to OBM when exporting to other Asian countries. For example, Giordano, Hong Kong's most renowned apparel brand, has moved its production to China and opened 300 stores across Southeast Asia and South Korea (Granitsas, 1998).

South Korea. Since the 1960s, the government of South Korea has led a systematic program of economic development. From the 1960s to the early 1990s, the South Korean economy grew rapidly. Apparel and textiles have played an important role in South Korean exporting. The apparel industry accounted for 18.5% of total export revenues in 1967 and 13.6% in 1990 (Lee & Song, 1994). However, the rapid growth of the Korean economy, coupled with the labor dispute of the late 1980s, resulted in a wage increase of almost 116% from 1980 to 1990 (Fields, 1994). In 1997, the Korean economy experienced a major financial crisis that weakened its position in the global market, caused in part by slowing international demand for Korean exports due to the expansion of other Asian nations (Kwack, 1999). Since South Korea has lost its advantage in low cost labor, it has invested in modern manufacturing, fortifying backward linkages. The domestic apparel market of South Korea is becoming more sophisticated and diversified, indicating that forward linkages are also improving. Currently, Korea's exports to the United States are OEM-based, and most apparel products made in Korea sell under American brand names by major U.S. retailers and branded marketers.

Bangladesh. Bangladesh has the least developed economy of the four countries in the study. Bangladesh's Gross Domestic Product (GDP) per capita in 1999 US dollars was only \$1,470 (CIA, 2000). Its telecommunication technology is meager and its infant mortality rate is extremely high compared to other nations. Bangladesh has a strong and inexpensive labor force that can be easily used for labor-intensive production. Bangladesh's apparel exports in the late 1970s were only US \$1 million. However, after a quarter century of phenomenal growth, its export income from apparel accounted for more than US \$3 billion. Bangladesh's major export partners include European Union countries (e.g., Germany, the United Kingdom) and the U.S. Bangladesh's success in the apparel sector stems from its distinct factor conditions including labor and the government support. The approximate hourly wage in 1998, as reported by the National Labor Committee in Bangladesh, was only 9 to 20 cents per hour, a huge differential compared to the U.S. (\$8.42 per hour). The Bangladesh government has supported the apparel industry by allowing exporters duty and tax-free imports of manufacturing materials (Dowlah, 1999). The apparel industry of Bangladesh lacks strong backward linkages, depending heavily on imported input materials such as synthetic fibers. It is also deficient in forward linkages (marketing and retailing), and its domestic market is undeveloped. Although full package exports are becoming more common, Bangladesh's major form of apparel exports to the U.S. is mere-assembly, because Bangladesh imports input materials from foreign countries and manufacturers under specifications given by U.S. retailers and branded marketers.

Italy. Italy demonstrates a relatively high GDP per capita (US \$21,400 in 1999) compared to South Korea and Bangladesh. Italy enjoys a reputation for fashion apparel and design and is currently the world's top high-end apparel and textiles exporter. Its major export partners include Germany, Japan, France, and the U.S. According to Moda Industria, Italy's apparel exports to the U.S. are primarily fashion branded apparel, such as Giorgio Armani, Prada,

Dolce and Gabbana, and Moschino (Stolz, 1998).

Based on the current analysis, the authors identify the position of Italy as OBM; Hong Kong and Korea as OEM; and Bangladesh as mere-assembly. Given the respective export positions of Hong Kong, South Korea, Bangladesh, and Italy in the apparel commodity chain, the following hypotheses are posited regarding unit values of apparel and textile imports to the U.S.

- H1: Apparel and textile imports from Hong Kong and Korea (OEM position) will have higher unit-values than imports from Bangladesh (Mere-Assembly Position).
- H2: Apparel and textile imports from Italy (OBM position) will have higher unit-values than imports from Hong Kong, Korea (OEM), and Bangladesh (Mere-Assembly).
- H3: Apparel and textile imports from Hong Kong and Korea (both OEM) will not show differences in unit values.

METHODS

Data

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In order to test the hypotheses trade data from the U.S. Department of Commerce Office of Textiles and Apparel (OTEXA) was used. OTEXA import data for the calendar years 1999-2001 were included in the analysis. The aggregated data on apparel and textiles imports from the four countries are presented in Table 1.

While the total import dollar values of apparel and textiles products from Hong Kong, South Korea, Bangladesh, and Italy accounted for 2% to 7% of U.S. world apparel and textile imports in 1999 (US DOC, 2000), the imported apparel goods may have sold at different price points when accounting for import quantity. OTEXA provides annual import data in the following forms: in U.S. dollar values (F.A.S., which stands for Free Along-side Ship. The F.A.S. price includes delivery of goods along side

the vessel or other mode of transportation and excludes the cost of loading and in quantity (meter squares). Unit values of apparel and textile imports (\$ per meter

square) can be obtained by dividing import dollar amount (in millions) by import quantity (in millions of meter squares) (Rodrik, 1994):

$$\text{Unit Value (dollar/meter}^2\text{)} = \text{Import Dollar Value} / \text{Import Quantity (meter squares)}$$

TABLE 1
U. S. Textiles and Apparel Imports from Four Countries, 1999-2001 (aggregated)

Country	Total Imports (0)			Apparel Imports (1)			Non-Apparel Imports (2)		
	1999	2000	2001	1999	2000	2001	1999	2000	2001
Bangladesh									
Million Dollar (F.A.S)	1753.872	2204.676	2204.994	1675.715	2115.92	2101.219	78.157	88.755	103.775
Million meter ²	910.519	1130.77	1169.041	773.077	966.612	965.942	137.442	164.158	203.099
Unit Values (\$/meter ²)	1.926	1.950	1.886	2.168	2.189	2.175	0.569	0.541	0.511
South Korea									
Million Dollar (F.A.S)	2887.161	3071.766	2930.829	2102.775	2264.063	2181.921	784.386	807.704	748.908
Million meter ²	1222.089	1311.775	1383.482	537.37	587.193	631.957	684.719	724.582	751.525
Unit Values (\$/meter ²)	2.363	2.342	2.118	3.913	3.856	3.453	1.146	1.115	0.997
Hong Kong									
Million Dollar (F.A.S)	4464.969	4706.955	4402.966	4255.871	4486.095	4211.399	209.098	220.860	191.567
Million meter ²	1017.557	1123.25	1092.272	840.948	587.193	631.957	176.609	206.945	175.341
Unit Values (\$/meter ²)	4.388	4.190	4.031	5.061	7.640	6.664	1.184	1.067	1.093
Italy									
Million Dollar (F.A.S)	2001.843	2128.545	2062.960	1355.429	1399.792	1392.892	646.413	728.753	670.068
Million meter ²	411.372	561.556	520.936	85.209	121.709	102.326	326.162	439.847	418.610
Unit Values (\$/meter ²)	4.866	3.790	3.9603	15.907	11.501	13.612	1.982	1.657	1.601
World									
Million Dollar (F.A.S)	63742.89	71691.55	70239.77	50795.30	57231.66	56460.38	12947.58	14459.89	13779.38
Million meter ²	28614.99	32864.15	32809.61	14102.86	16035.35	16103.47	14512.13	16828.80	16706.14
Unit Values (\$/meter ²)	2.228	2.181	2.141	3.602	3.569	3.506	0.892	0.859	0.825

Table 1 presents estimated unit values of U.S. apparel and textile imports for Hong Kong, South Korea, Bangladesh, Italy, and the world (total imports) for aggregated categories, i.e., 1-digit categories. The category "0" includes total imports of all fibers from each country, which can be further broken down to apparel imports (category 1) and non-apparel imports (category 2). Detailed classification (3-digit categories) included over 170 categories using the U.S. textile and apparel category system prepared by the U.S. Department of Commerce Office of Textiles and Apparel following the Multi-Fiber Arrangement (MFA), which is used to monitor imports of apparel and textile products under the administration of bilateral agreements with foreign countries. This system corresponds

to the Harmonized Tariff Schedule of the United States.

Analysis

The Wilcoxon signed rank sum test was used to test for statistical differences in unit values of apparel and textiles imports to the United States within the specific textile and apparel categories. The Wilcoxon test considers both the direction (positive or negative) and relative magnitude of differences (Rodrik, 1994; SAS/STAT User's Guide, 1994). Wilcoxon provides a non-parametric approach; thus robust results can be obtained regardless of the data's particular distribution. Given that unit values are ratio data, it was appropriate to use a non-parametric test. The Wilcoxon test ranks the absolute values of the

differences and then sums the ranks of the differences for positive and negative values, respectively. A p-value less than 0.05 indicates that the two sums of the ranks are significantly different.

RESULTS

According to the unit values of apparel and textile imports to the United States, differences in unit values among the four countries are more pronounced in apparel imports (category 1) than in non-apparel imports (category 2). In 1999, by exporting one square meter of apparel product, Italy earned \$15.91; Hong Kong, \$ 5.06; South Korea, \$3.91; and Bangladesh, \$2.17. In 2001, the average import value of “Made-in-Italy” apparel (13.612) is about 6.25 times that of “Made-in-Bangladesh” apparel (2.175), 3.94 times “Made-in-Korea” apparel (3.453), and 2.04 times “Made-in-Hong Kong” apparel (6.664). Non-apparel imports of \$12.9 billion, \$14.4 billion, and \$13.8 billion (1999, 2000, and 2001, respectively hereafter) is approximately a quarter of apparel imports (\$51 billion, \$57 billion, and \$56 billion) in dollar terms; however, they also show the same pattern of country hierarchy. The unit values of non-apparel imports were 1.982, 1.657, and 1.601 for Italy; 1.184, 1.067, and 1.093 for Hong Kong; and 1.146, 1.115, and 0.997 for Korea; and 0.569, 0.541, and 0.511 for Bangladesh.

Hypothesis Tests

Hypothesis one examined unit value differences between the OEM export position (Hong Kong, Korea) and the mere-assembly export position (Bangladesh). Table 2 shows significant differences between Korea and Bangladesh for all three years of 1999, 2000, and 2001 ($p < 0.0001$), and between Hong Kong and Bangladesh for all three years ($p < 0.0001$). Hypothesis one was supported, indicating that unit values of apparel and textile imports from countries that engage in OEM are higher than unit values of imports from mere-assembly countries.

Hypothesis two proposed that OBM-based exports (Italy) would generate higher unit values than OEM-based exports (Hong Kong, Korea) and mere-assembly-based exports (Bangladesh). The results of the tests demonstrated statistically different unit values between imports from Italy and imports from Hong Kong for all three years ($p < 0.0001$), between imports from Italy and imports from Korea ($p < 0.0001$), and between imports from Italy and imports from Bangladesh ($p < 0.0001$) for all three years. Therefore, Hypothesis 2 was also supported. These results indicate that OBM-based exports generate higher import values for apparel and textile products than OEM-based or mere-assembly-based exports.

To test Hypothesis three, which proposed that the unit values of apparel and textile products exported by countries holding the same export positions in the apparel commodity chain would not be different, we compared Hong Kong and Korea. The results of the test did not detect significant differences between Hong Kong and Korea for all three years ($p > 0.3$), thereby supporting Hypothesis three. This demonstrates that economic profits generated from apparel and textile imports from countries that hold the same export positions within the apparel commodity chain may be similar.

CONCLUSIONS

The primary finding of this study is that the four-country analysis supported Gereffi’s Global Commodity Chain theory. The three export positions were confirmed using the US import data. It was also found that the apparel commodity chain is constructed so that countries that export their own brand names likely enjoy the highest unit values, followed by countries that engage in full-package production without owning brands. In contrast, countries that engage in mere-assembly production which exploits low wage labor must use mass production of low value-added apparel to remain profitable.

TABLE 2
Pair-wise (Wilcoxon) Comparisons of Unit Values of Apparel and Textile Imports

Comparisons Between	Year	Signed Rank Sum	p-value	Hypothesis	Testing
Korea – Bangladesh	1999	889.5	<0.0001	1	Supported
	2000	910.5	<0.0001	1	Supported
	2001	902	<0.0001	1	Supported
Hong Kong – Bangladesh	1999	551.5	<0.0001	1	Supported
	2000	975.5	<0.0001	1	Supported
	2001	990.5	<0.0001	1	Supported
Italy - Hong Kong	1999	963	<0.0001	2	Supported
	2000	1104	<0.0001	2	Supported
	2001	1101	<0.0001	2	Supported
Italy – Korea	1999	1507	<0.0001	2	Supported
	2000	1669.5	<0.0001	2	Supported
	2001	1594.5	<0.0001	2	Supported
Italy – Bangladesh	1999	637.5	<0.0001	2	Supported
	2000	741.5	<0.0001	2	Supported
	2001	714.5	<0.0001	2	Supported
Hong Kong - Korea	1999	-191	0.3260	3	Supported
	2000	129	0.4958	3	Supported
	2001	-177	0.3500	3	Supported

Developing a higher value position with high-margin apparel products may become extremely important when textile and apparel trade is subject to quantity restrictions (QR). Under quota restrictions, finding a strong competitive position *vis-a-vis* other nations in the value chain can determine profitability and national productivity. Therefore, *positioning within the global commodity chain* becomes a critically important strategic decision for the participant countries and the companies within these countries.

Another area that warrants research attention is the dynamic changes of export positions within a global commodity chain. This three-year analysis demonstrated some significant unit value differences between the export positions. However, as each country strives to develop unique competitive advantages and upgrade their position, future configuration of the global apparel commodity chain may have a different shape.

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