

## Export Positions in the Global Apparel Commodity Chain and Unit Values of Apparel and Textile Products Exported to the United States

### 국제의류사슬 내 수출위치가 섬유 및 의류제품의 미국 내 수출단가에 미치는 영향

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#### Abstract

본 연구는 국제의류사슬 내 수출위치를 단순조립생산 (Mere-Assembly Production), 주문자 상표부착 생산방식 (Original Equipment Manufacturing), 고유상표 생산방식 (Original Brand Name Manufacturing)으로 규명하고, 각 국가의 의류사슬 내 수출 위치가 수입 단가에 어떠한 영향을 미치는지 조사하였다. 1999년 미국 Department of Commerce의 무역자료를 사용하여 국제의류사슬 내 각각의 위치를 점하고 있는 방글라데시, 홍콩, 한국, 이태리를 비교한 결과, 의류사슬 내 위치에 따라 이들 국가로부터의 섬유 및 의류제품의 미국 내 수출 단가가 통계적으로 유의한 차이를 보이는 것으로 나타났다.

**Key words:** Global Apparel Commodity Chain, Export Positions, Unit Values, International Trade;  
국제의류사슬, 수출위치, 단가, 국제무역

#### I. Introduction

Suppose that country A makes over \$160 for exporting one man-made fiber suit whereas country B earns less than \$32.<sup>1)</sup> Why are there such wide variations in export prices for apparel and textile products in the global market? How can one country become a more profitable exporter in the global apparel market than it is now? This paper is an attempt to investigate the unit values of

the apparel and textile exports of four countries that occupy different export positions in the Global

1) The authors' analysis of unit values (\$/m<sup>2</sup>) of US imports in 1999 showed that Korean export prices for man-made fiber suits were \$7.59 (male suit, Category 643) and \$7.18 (female suit, Category 644). For the same apparel categories, the unit values of US imports from Italy were \$43.60 (Category 643), and \$40.14 (Category 644), respectively. For consistency, the authors assumed that it takes about 4m<sup>2</sup> to manufacture one suit.

Apparel Commodity Chain.

Presently, world production of apparel occurs in the vertically disintegrated subcontracting networks (Christerson & Appelbaum, 1995, of the so-called global commodity chain (Gereffi, 1994, 1999). Because the apparel production process of cutting, trimming, and sewing is particularly hard to mechanize, apparel is traditionally believed to be a highly labor-intensive industry (Cline, 1990; Gereffi, 1997). The labor-intensive nature of apparel production has fostered growth of international production and trade networks seeking economic efficiency. The theory of Global Apparel Commodity Chain notes that countries participating in the global apparel commodity chain assume different export positions - ranging from labor-intensive mere-assembly manufacturing, original equipment manufacturing (OEM), to capital-intensive original brand name manufacturing (OBM) (Christerson & Appelbaum, 1995; Gereffi, 1996, 1999). However, how these different export positions relate to the levels of profit margins enjoyed by a particular apparel exporting country has not been systematically investigated.

The apparel and textile industries have been the major generator of revenue for the Korean economy over the past four decades. According to Lee and Kwon (2001), the apparel and textile exports consisted of almost one fifth of total Korean exports in 1994. However, Lee and Kwon (2001) also noted that the average added value created by the Korean apparel and textile industries might be lower than those created by the apparel industries of developed countries, such as the U.S. and France. Given that different export positions may result in different levels of revenue and profits, it is important to identify Korea's export position within the Global Apparel Commodity Chain and develop strategies to move toward a more profitable

position vis-a-vis other nations in the global network.

This study examines how a country's particular position in the apparel commodity chain affects its value position using the unit values of the apparel and textiles products exported to the United States. Four countries -- Korea, Hong Kong, Bangladesh, and Italy -- that are at different developmental stages and hold varying positions in the global apparel commodity chain--are compared for the respective unit values of apparel and textiles exported to the United States (U.S.). Unit values of U.S. apparel and textile imports are estimated using the 1999 trade data provided by the U.S. Department of Commerce (DOC) Office of Textiles and Apparel (OTEXA).

## II. Literature Review

### 1. The Apparel Commodity Chain

Apparel production is one of the most globalized activities in the world economy (Christerson & Appelbaum, 1995; Frobel, Heinrichs, & Kreye, 1980). A commodity chain is defined as "the whole range of activities involved in the design, production, and marketing of a product" (Gereffi, 1999, p. 38). The export position of a particular country within the global apparel commodity chain (mere-assembly, OEM, or OBM) is determined by the available resources and capabilities accumulated by that country's apparel industry over the course of industry development (Porter, 1998). 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 (See Madhok, 1996; Wernerfelt, 1989 for discussion on relationship

rents and brand name rents). Countries that possess such resources and capabilities are, therefore, likely to develop advanced competitive advantages beyond merely offering a low-cost product, and can command high values in the world markets. Jeon (1999) notes that the technological gaps between countries may explain the different bases for apparel exports. For example, technologically advanced countries tend to export innovative high-profit textile products whereas less advanced countries tend to produce and export low-margin textile products using their inexpensive labor.

Importantly, the apparel industry is specifically characterized as a buyer-driven commodity chain, in which retailers and branded marketers rather than manufacturers play lead roles. Without owning any manufacturing factory, the retailers and branded marketers coordinate a global supply chain (Frobel, Heinrichs, & Kreye, 1980; Gereffi, 1994) and capture substantial portions of the value chain (Craig & Douglas, 1997; Krishna, Erzan, & Tan, 1994). Lead firms in the buyer-driven commodity chain do not make products. Instead, their core competencies lie in understanding end-users' preferences, designing products, forming cost-efficient global sourcing networks, and selling finished products with the right distribution plan.

Buyer-driven commodity chains tend to be vertically disintegrated, because retailers and branded marketers are positioned close to the end-user market, focusing on the front end (designing and planning) and the back end (marketing and retailing) of the transnational value chain. In addition, they are able to administer global sourcing networks that encompass subcontractors in a variety of countries by utilizing advanced technologies and financial resources (Christerson, 1994; Gereffi, 1994).

At the other end of the apparel commodity chain are less developed countries (LDC). Workers in less developed countries dye, cut, trim, and sew to manufacture apparel products, following the specifications given by foreign lead firms in the apparel commodity chain. Because less developed countries have abundant cheap labor, yet are deficient in capital and technology, they usually take a labor-intensive position and manufacture ready-made clothing as subcontractors.

## 2. Export Positions in the Apparel Commodity Chain

In the global apparel commodity chain, countries are linked by assuming different roles in supplying apparel products to the world markets (Gereffi, 1999). It is important to note that each country in the apparel commodity chain has a different mix of resources and capabilities depending on its developmental stage, and that a particular country's export position in the apparel commodity chain is determined primarily by available resources and capabilities accumulated during the course of industry development (Porter, 1998).

Based on the literature and the current trade practice, we identify the following three major export roles in the global commodity chain: mere-assembly based exports, original equipment manufacturing (OEM) based exports, and original brand name manufacturing (OBM) based exports (Gereffi, 1999).

*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 represents mere assembly of imported inputs for export, which involve the most minimal forward and backward linkages.

Assembly-based exports compete solely on low price based on a cheap labor force, and thus tend to be the least profitable and least sustainable positions (Campbell and Parisotto, 1995).

*Original Equipment Manufacturing.* Original equipment manufacturing (OEM) based exports refer to the manufacturing of apparel products arranged by contractors to be sold under another company's brand name, mostly in the markets of developed countries. The firms who engage in OEM-based exports have technical skills; however, their marketing and distribution capabilities are not fully developed to the extent to which they can design and market apparel products to sophisticated end 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).

### **3. Profits (Economic Rents) in the Apparel Commodity Chain**

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, 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 of entry that can generate economic "rents" in the transnational value chain. The following types of rents are used as barriers of entry to the apparel commodity chain: 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 added value generated by the techniques of 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 by highly differentiated products with unique brand names in the world apparel markets (Dyer & Singh, 1998; Madhok, 1996; Wernerfelt, 1989).

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. Specifically, original brand name manufacturers can organize transnational supply chain networks, utilizing financial resources and telecommunication technologies for cost-efficient production (relational rents). Additionally, their core competencies include highly differentiated apparel products with original brand names. Since consumers will pay premium prices for well-known brand names, original brand name manufacturers can create added value using brand name premiums.

Countries engaging in original equipment manufacturing may possess the infrastructure, assets, and semi-skilled labor to produce quality apparel and textile products. There is some spillover effect in terms of the transfer of foreign skills and managerial practices via original equipment manufacturing. 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 production get minimal support from supporting industries in the forward and backward linkages (Gereffi, 1999). Although these countries may have sourcing partnerships, the governance structure of the value chain allows mere-assemblers only small profit margins. Therefore, it is unlikely that countries engaging solely in mere-assembly can create added value from relational or brand name rents.

Gereffi (1994, p.99) posits that profits in buyer-driven commodity chains derive not from scale, volume - but rather from unique combinations of high-value research, design, sales, marketing, and financial services. Therefore, it is likely that original brand name manufacturers enjoy the highest profits in the value chain, followed by original equipment manufacturers. Due to their lack of resources and capabilities, mere-assemblers, share the least amount of profits in the value chain.

#### **4. Research Hypotheses: Comparing Unit Values of Apparel and Textile Imports**

In this section, we select four countries-- Hong Kong, Korea, Bangladesh, and Italy-- and compare their respective export positions within the global apparel commodity and unit values generated from U.S. textile and apparel imports. These four countries were selected because (1) they are the world's major suppliers of apparel and textiles products, and (2) they hold varying positions in the global apparel commodity chain.

In investigating the relationship between export positions in the apparel commodity chain and resulting profits, we employ unit values of apparel products as a proxy for profits. Although unit values may include both costs of goods and profit margins, we assume that for a particular apparel category, higher unit values lead to greater profit

margins. Rodrik's (1994) study suggests that unit values can proxy quality. Since high quality products result in high profits in most instances, Rodrik's usage also supports our logic.

A country's economic status may influence its export role in the world apparel trade (Porter, 1998). In this paper, we identify the position of Italy as OBM; Hong Kong and Korea as OEM; and Bangladesh as mere-assembly, based on available resources and capabilities. Given the respective export positions of Hong Kong, Korea, Bangladesh, and Italy in the apparel commodity chain, the following hypotheses are generated regarding unit values of apparel and textile imports to the U.S.

**Hypothesis 1:** The unit values of apparel and textile imports to the U.S. are determined by a given exporting country's position within the Apparel Commodity Chain. Apparel and textile imports from those countries engaging in OEM (Hong Kong and Korea) will have higher unit-values than apparel and textile imports from a country engaging in mere-assembly (Bangladesh) (H1a). Likewise, apparel and textile imports from a country engaging in OEM (Italy) will have higher unit-values than apparel and textile imports from those countries engaging in OEM (Hong Kong, Korea) or mere assembly (Bangladesh) (H1b). Finally, there will be no differences between those countries engaging in OEM (Hong Kong and Korea) in the unit values of apparel and textile imports to the U.S. (H1c).

A complete pair-wise comparison of the four countries will result in six different country pairs. Specifically, hypothesis 1a proposes the differences in unit values of apparel and textile between the OEM export position and the mere-assembly export position: thus, two country pairs (Korea-Bangladesh, Hong Kong-Bangladesh) are analyzed. Likewise, hypothesis 1b proposes the

difference between the OBM export position and the OEM and mere-assembly positions; thus, three country pairs (Italy-Hong Kong, Italy-Korea, Italy-Bangladesh) are analyzed. Finally, hypothesis 1c proposes that countries holding the same OEM export positions will not differ in levels of profits; thus, one pair (Hong Kong-Korea) is analyzed.

### III. Methods

#### 1. Data

In order to test the research hypotheses, we used trade data provided by the U.S. Department of Commerce. The Office of Textiles and Apparel (OTEXA) within the U.S. Department of Commerce International Trade Administration provides import data for detailed apparel and textiles categories. The aggregated data on apparel and textiles imports from the four countries-- Hong Kong, Korea, Bangladesh, and Italy--are presented in Table 1. The detailed categories are available from the first author.

While the total import dollar values of apparel and textiles products from Hong Kong, 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 the import quantity is accounted for. The Office of Textiles and Apparel provides annual import data in two different forms: in U.S. dollar values (F.A.S.) and in quantity (meter squares). Unit values of apparel and textile imports (\$ per meter square) can be obtained by dividing import dollar amount (millions of dollars) by import quantity (millions of meter squares) (Rodrik, 1994).

#### 2. Analysis

First, unit values of apparel and textile imports

were estimated with the following equation:

$$\text{Unit Values (dollar/meter}^2\text{)} = \text{Import Values (dollars)} / \text{Import Quantity (meter squares)}.$$

Table 1 presents estimated unit values of U.S. apparel and textile imports for Hong Kong, Korea, Bangladesh, Italy, and the world (total imports) for aggregated 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).

Next, in order to test statistical differences in unit values of apparel and textiles imports to the United States in detailed textile and apparel categories, the Wilcoxon signed rank sum test was adopted. The Wilcoxon test considers both the direction (positive or negative) and the relative magnitude of differences (Rodrik, 1994; SAS/STAT User's Guide, 1994). The Wilcoxon test is a non-parametric test; thus, robust results can be obtained regardless of the data's particular distribution. Specifically, 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 smaller than 0.05 indicates that the two sums of the ranks are significantly different.

### IV. Results

#### 1. Unit Values of Apparel and Textile Imports

Unit values of total aggregated apparel and textile imports to the United States (category 0) are 4.388 for Hong Kong, 2.363 for Korea, 1.926 for Bangladesh, and 4.866 for Italy (Table 1).

In other words, Italy made \$4.87 for selling one square meter of apparel and textile products to the United States, while Bangladesh made only \$1.93 for selling the same amount of products. The differences in unit values among these countries

Table 1. Textile and Apparel Imports to the United States in Aggregation 1999

Country	Total Imports (Category "0")		Apparel Imports (Category "1")		Non-Apparel Imports (Category "2")	
	Million \$ (% as a share of world imports)	Million Meter <sup>2</sup> (%)	Million \$ (%)	Million Meter <sup>2</sup> (%)	Million \$ (%)	Million Meter <sup>2</sup> (%)
Korea	2887.161 (4.5)	1222.089 (4.3)	2102.775 (4.1)	537.37 (3.8)	784.386 (6.1)	684.719 (4.7)
Unit Value (\$/meter <sup>2</sup> )	2.363		3.913		1.146	
Bangladesh	1753.872 (2.3)	910.519 (3.1)	1675.715 (3.3)	773.077 (5.5)	78.157 (0.6)	137.442 (1.0)
Unit Value (\$/meter <sup>2</sup> )	1.926		2.168		0.569	
Hong Kong	4464.969 (7.0)	1017.557 (3.6)	4255.871 (8.4)	840.948 (6.0)	209.098 (1.6)	176.609 (1.2)
Unit Value (\$/meter <sup>2</sup> )	4.388		5.061		1.184	
Italy	2001.843 (3.1)	411.372 (1.4)	1355.429 (2.7)	85.209 (0.6)	646.413 (5.0)	326.162 (2.3)
Unit Value (\$/meter <sup>2</sup> )	4.866		15.907		1.982	
World	63742.89 (100)	28614.99 (100)	50795.3 (100)	14102.86 (100)	12947.58 (100)	14512.13 (100)
Unit Value (\$/meter <sup>2</sup> )	2.228		3.602		0.892	

are more pronounced in apparel imports (category '1') than in non-apparel imports (category '2') (Table 1).

By exporting one square meter of apparel products, Italy earned \$15.91; Hong Kong, \$ 5.06; Korea, \$3.91; and Bangladesh, \$2.17. That is, the average import value of Made-in-Italy apparel is about seven times that of Made-in-Bangladesh apparel, four times Made-in-Korea apparel, and three times Made-in-Hong Kong apparel. Non-apparel imports in 1999 (\$13 billion) accounted for a quarter of apparel imports (\$51 billion); however, they also show the same pattern of country hierarchy. The unit values of non-apparel imports were 1.982 for Italy, 1.184 for Hong Kong, 1.146 for Korea, and 0.569 for Bangladesh.

## 2. Hypothesis Tests

The relationships between three export positions

within the apparel commodity chain and unit values of apparel and textile imports are examined using the research hypotheses. The differences in unit values of apparel and textile imports by these four countries are examined by conducting the Wilcoxon Rank Sum tests on detailed categories. Five rank sums were statistically significant (except the pair of Korea and Hong Kong that was previously proposed for no differences) and had the expected signs.

First, regarding the unit value differences between the OEM export position (Hong Kong, Korea) and the mere-assembly export position (Bangladesh), we found significant differences between Korea and Bangladesh (Signed rank sum=889.5,  $p<0.0001$ ), and between Hong Kong and Bangladesh (Signed rank sum=110.3,  $p<0.0001$ ). Therefore, hypothesis 1a 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 1b 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 Wilcoxon Rank Sum tests demonstrated statistically different unit values between imports from Italy and imports from Hong Kong (Signed rank sum=963,  $p<0.0001$ ), between imports from Italy and imports from Korea (Signed rank sum=1507,  $p<0.0001$ ), and between imports from Italy and imports from Bangladesh (Signed rank sum=637.5,  $p<0.0001$ ). Therefore, hypothesis 1b 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.

In order to test hypothesis 1c, 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. Currently both countries appear to engage mainly in OEM when exporting to the United States. The results of the Wilcoxon Rank Sum test did not find any significant differences between Hong Kong and Korea (Signed rank sum=-191,  $p=0.326$ ), thereby supporting hypothesis 1c. 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.

While comparisons of unit values in detailed categories are omitted due to space limitation, a strong contrast was found. For example, for one meter square of male suit (Wool, Category "443") exported to the U.S., Italy made \$40.359 whereas Korea made only \$15.330. For flat goods,

handbags, luggages (Man-Made Fiber, Category "670"), Italy enjoyed \$27.149 whereas Korea earned only \$2.678.

## V. Discussions and Implications

This study identified three export positions within the apparel commodity chain and examined the relationship between export positions and resulting profits, using unit values as a proxy for profits. Using the 1999 trade data on apparel and textile imports provided by the U.S. Department of Commerce Office of Textiles and Apparel, this study found the three export positions within the apparel commodity chain resulted in different levels of imported apparel and textile products. That is, the apparel commodity chain is constructed in such a way that countries exporting under their own brand names may enjoy the highest profit margins, 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 utilize mass production of low value-added apparel to remain profitable.

It should be noted that this issue of unit values of apparel and textile exports is critical to the future of the clothing and textiles academia and the survival of the textile and apparel industries in the rapidly changing global market. Evidently, Korean textile industries have been experiencing difficulties over the years which can be attributed to the decrease in exports and increase in imports in the apparel and textile sector. Contrary to conventional wisdom, a decrease in the total quantity of apparel and textile exports may not necessarily be a negative value proposition, if the country now exports more expensive high-end products and when the apparel trade is under quota restriction.



Since the unit value of the exported product is higher, the country can still enjoy high profits with less export quantity given the quota restriction. However, if the country continues to export low-margin products and yet the imports of high-end apparel and textile products increase, that can exacerbate the country's weak position and the future of the industry is also at stake. Unit values of textile and apparel exports can provide useful information about profitability.

Why are buyer-related positions more profitable, competitive positions with the global apparel commodity chain? Perhaps it is because apparel (and textile products) have extremely short product cycles, and consumer demands for fashion products are particularly hard to predict. Because a proper understanding of, and quick response to, ever-changing demand conditions is a critical success factor, lead firms of the apparel commodity chain tend to locate themselves geographically and culturally close to end consumers. The lead firms of the apparel commodity chain spend their resources on R&D, marketing, and distribution functions to develop innovative products and control the distribution system, knowing that sources of more profitable and sustainable competitive advantages stem from innovative product development, marketing, and distribution capabilities rather than low cost production. In doing so, they also create barriers to entry to ensure their superior profit positions within the transnational value chain.

In this regard, apparel and textiles may as well be capital- and technology-intensive industries particularly because implementing product designing, marketing, and distributing strategies to create and deliver value to world consumers require substantial financial and technological resources. As academicians and practitioners both

aim for high value creation and high profitability from the Korean apparel and textile exports in the future, education is the key. We need to focus on the profitable and promising areas that ensure a stronger vis-a-vis position within the global apparel commodity chain when developing educational curriculums and business plans.

The limitations of this study reflect the limitations of the data. By including another international data set on apparel and textile production costs, future research should be able to establish a stronger link between unit value and profit. Despite this limitation, the findings of this study strongly suggest that the apparel commodity chain is indeed a buyer-driven value chain, wherein those with access to the end user market with original brand names capture greater shares of the value chain than manufacturers (Craig & Douglas, 1997).

## VI. Conclusions

This study investigated export positions within the global apparel commodity chain and resulting profit implications. In doing so, this study found that the apparel commodity chain is indeed buyer-driven because profits may be unevenly shared among countries, and those that have moved beyond the low cost position by developing advanced and sustainable competitive advantages may enjoy the lion's share. Therefore, within the apparel commodity chain, countries that are capable of designing, marketing, and distributing apparel product to meet ever-changing end consumers needs seem to enjoy higher profits than countries with a production and manufacturing orientation.

Future configurations of the global apparel commodity chain under the WTO agreement will

be much more complex and result in a fiercely competitive environment. In such a competitive environment, finding a strong competitive position vis-a-vis other nations in the value chain will become be of crucial importance for countries who wish to remain successful in the global apparel market.

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