The US and Japanese apparel demand conditions: implications for industry competitiveness

By: Juyoung Lee, Elena Karpova

Lee, J., & Karpova, E. (2011). U.S. and Japanese apparel industry demand conditions: Implications for industry competitiveness. *Journal of Fashion Marketing and Management, 15*(1), 76-90.

Made available courtesy of Emerald: http://dx.doi.org/10.1108/13612021111112359

Abstract:

Purpose- The purpose of this paper is to investigate aggregated apparel demand in the USA and Japan and to assess the positions of apparel products manufactured in the USA and Japan in comparison to imported apparel.

Design/methodology/approach- Based on Porter's industry competitiveness theory as a theoretical framework, the two‐step demand analysis, time‐series market analysis and elasticities of demand using “Almost ideal demand system” was conducted in order to reveal the overall market conditions of the USA and Japan and the market positions of domestically manufactured and imported apparel products in both countries.

Findings- Regardless of the country of origin, US consumers were price conscious in purchasing apparel products because they decreased purchase for not only domestically produced products but also imported products when prices increased. However, Japanese consumers' price concept toward apparel products was dual. They increased their purchase of domestically made products if the price was higher, and decreased their purchase of imported products.

Originality/value- This paper provides a framework for the apparel industry competitiveness assessment with regard to the demand‐side analysis of Porter's competitiveness theory. Moreover, there is no research in the current literature that assessed the US apparel demand with regard to industry competitiveness and a cross national view, especially compared with the Japanese apparel industry.

Keywords: clothing | competitive strategy | demand management | United States of America | Japan

Article:

Introduction

Following Adam Smith (1937) and David Ricardo's (1962) attempts to explain the mechanisms of industry competitiveness through absolute advantage theory and comparative advantage theory, many scholars have proposed various economic theories to advance our understanding of this phenomenon (Dorfman, 1991). Among them, Porter's competitive advantage theory has been recognized as one of the most influential (e.g. Adner and Zemsky, 2006; Pavlou and Slawy, 2004). This theory proposed that national competitiveness could be achieved by a cluster of strong domestic industries with various interaction factors (Porter, 1990). These interaction factors account for a nation's economic environment, institutions, and policies represented by "factor conditions, demand conditions, related and supporting industries and firm strategy, structure, and rivalry" (Porter, 1990, p. 78), which are directly and indirectly influenced by government regulations. Porter argued that effective interactions between these five factors could result in a geographical concentration, or cluster, of a competitive domestic industry (Porter, 1990).

Most researchers who used Porter's theory to explain the development of industry competitiveness focused on the industry itself, including firm strategies, structure, and rivalry, or presence of an industry cluster (Adner and Zemsky, 2006). Only a few studies examined the role of demand conditions in the competitiveness assessment, despite the fact that Porter emphasized the importance of this factor for "success within the immediate market" (Grant, 1991, p. 545) as well as a main firm strategy driver for innovation in the process of serving a sophisticated consumer market (Nevo, 2000). In the context of textile and apparel, scholars focused on assessing competitiveness of domestic industries by analyzing firm strategy, structure, and rivalry (Bruce et al., 2004; Sullivan and Kang, 1999), related and supporting industries (Lam and Postle, 2006; Teng and Jaramillo, 2006) and factor conditions (Datta and Christoffersen, 2005). To our knowledge, no study has empirically analyzed competitiveness of apparel industry with respect to demand conditions.

This study investigated apparel industries in the USA and Japan in relation to domestic market conditions, which is believed to be one of the factors that shape industry competitiveness (Porter, 1990). Even though the USA and Japan are both developed nations, the respective apparel industries have different positions within the domestic markets (Arpan et al., 1982; Kanamori, 1988). It is believed that the USA failed to sustain apparel industry competitiveness (Arpan et al., 1982; Murray, 1995; Blinder, 1990) while the Japanese apparel industry was able to maintain its competitiveness (Kanamori, 1988; Yoshimatsu, 2000). An investigation of apparel demand conditions in the two developed economies and the positions of domestic apparel industry in the respective markets can help understand the role of demand in shaping industry competitiveness (Porter, 1990) and offer an explanation why the US apparel industry had lost its competitiveness whereas the Japanese industry was able to remain competitive.

The purpose of this research was to assess domestic demand conditions in order to explain competitiveness of apparel industries in the USA and Japan. The objectives of the study included:

- analyses of overall apparel demand conditions in the USA and Japan; and
- assessment of price and income sensitivity and market position of domestically produced apparel in comparison to imported apparel for both countries.

To address the purpose of the study, apparel demand conditions in the USA and Japan were analyzed from 1995 to 2004, during the Agreement on Textiles and Clothing, a transitional

arrangement to replace the Multifiber Agreement that governed the international apparel trade from 1974 (Dickerson, 1999). To compare price and income sensitivity and market positions of domestically produced and imported apparel in both countries, Deaton and Muellbauer's (1980) almost ideal demand system (AIDS) was used to calculate price, income, and cross‐price elasticities.

Literature review

The recent apparel demand literature focuses on forecasting the demand using social, demographic, and economic variables. For example, Fadiga and Mirsa (2005) investigated reasons for the US apparel demand growth. They focused primarily on consumer demographics and product characteristics in relation to the US apparel demand. Wagner and Mokhtari (2000) examined relationships between seasonality and apparel expenditure change. They confirmed that consumer apparel expenditure varied by season as well as age, ethnicity, household size, region, and housing tenure. The most recent research that examined apparel demand in relation to industry competitiveness dates back to Arpan et al.'s work in 1982. The authors investigated not only the US market, including domestic production, import and export, but also analyzed apparel industries in other countries, including Japan and European nations (Arpan et al., 1982). A more up‐to‐date cross‐national research of apparel demand in relation to industry competitiveness is needed.

Consumer demand theory: price, income, and cross-price elasticities

The concept of elasticity of demand was proposed by Alfred Marshall (1895) to explain the relationship among product price, consumer income, and consumer demand (Equation 1 to Equation 3). He used price elasticity to explain relationship between product price and consumer demand; income elasticity to understand relationship between consumer income and consumer demand; and cross‐price elasticity to represent relationship between price of a substitute and demand of an original product (Marshall, 1895). Since the first introduction of elasticities of demand, the concept of elasticity has been used as a foundational principle to understand how and why people consume (Library of Economics and Liberty, 2008). The concept of elasticity proved to be very useful because it measures any demand category, assesses any determinant of the quantity demanded, and is interpreted easily as a measure of consumer responsiveness to product price changes, income changes and cross‐price changes (Eastwood, 1985): Equation 1Equation 2Equation 3 Practical interpretation of price, income, and cross‐price elasticities was further developed and used by various researchers (Besley, 1989; Deaton and Muellbauer, 1980; Dubois and Duquesne, 1993; Gottheil, 2005; Kemp, 1998; Lipsey, 1989, Scheller and Kunz, 1998). Price elasticity is used to explain differences in human needs for various products and differentiate between necessity products and luxury products. Gottheil (2005, p. 78) stated that the amount of products that “represent basic needs in our society” would not increase or decrease substantially when there was a price change. However, consumers would significantly change the amount of luxury goods purchase when there was a price change because the needs for luxury goods are secondary (Gottheil, 2005). As a result, the price elasticity of necessities remains lower than that of luxury products (Gottheil, 2005).

$$\text{Price elasticity: } e_d = \frac{\text{percentage change in quantity demanded}}{\text{percentage change in price}} \quad (1)$$

$$\text{Income elasticity: } e_y = \frac{\text{percentage change in quantity demanded}}{\text{percentage change in income}} \quad (2)$$

$$\text{Cross-price elasticity: } e_c = \frac{\text{percentage change in demand of a substitute}}{\text{percentage change in price of a product}} \quad (3)$$

Income elasticity is used to differentiate between high quality and inferior quality products (Gottheil, 2005; Lipsey, 1989). Inferior goods are "goods for which demand decreases when people's incomes increase," (Gottheil, 2005, p. 90), which means that people buy lower quality products when their income is low because "more desirable substitutes are financially beyond their reach" (Gottheil, 2005, p. 90). As their income increases, however, consumers will readily switch to higher quality products (Gottheil, 2005). As a result, products with negative income elasticities are inferior goods, whereas products with positive income elasticities are high quality goods (Gottheil, 2005; Lipsey, 1989).

Cross-price elasticity measures "the percentage change in demand for one good generated by a percentage change in the price of another good" (Eastwood, 1985, p. 86). Cross-price elasticity shows the degree to which one product can be a substitute for another product (Eastwood, 1985).

Almost ideal demand system

This research assumes that there are two kinds of apparel goods consumed in one household: domestically produced apparel and imported apparel. The amount of goods a person can purchase is restrained by the amount of budget the person has. The budget line lies on the demand curve that determines which combination of the two products, domestic or imported, to purchase (Eastwood, 1985; Gottheil, 2005). Total apparel expenditure equals the sum of the price of domestically produced apparel times quantity purchased and the price of imported apparel times quantity purchased (Equation 4). As there are only two product categories, budget function and price change in one product category influences how much consumers will spend on the other product category. Equation 4 where:

$$E = q_1 p_1 + q_2 p_2$$

where:

E Household apparel expenditure.

q_1 Quantity of purchased apparel that was produced domestically.

p_1 Price of domestically produced apparel.

q_2 Quantity of purchased imported apparel.

p_2 Price of imported apparel.

Deaton and Muellbauer (1980) introduced almost ideal demand system (AIDS) which allowed researchers to calculate price, income and cross-price elasticities in an easier way. The model which is based on a budget function has been widely adapted by scholars from different fields, such as agriculture, tourism, banking, and household and welfare economics (Cheshire and Sheppard, 2002; Hughes et al., 2000; Lewbel, 1989; Papatheodorou, 2001; Verbeke, 2001). AIDS estimates price, income and cross-price elasticities as follows (Deaton and Muellbauer, 1980):

$$w_i = \alpha_i + \sum_j \gamma_{ij} \log p_j + \beta_i \log\{x/P\} \quad (5)$$

$$\log P = \alpha_0 + \sum_k \alpha_k \log p_k + \frac{1}{2}\sum_j \sum_k \gamma_{kj} \log p_k \log p_j \quad (6)$$

Equation 5 includes budget share of good i (w_i), price of a product j (p_j), total household expenditure (x), and a price index (P). Equation 6 is used to calculate price index (P) in Equation 5. The β_i coefficients represent income elasticities, the $\gamma_{ij}^{i=j}$ determinants represent price elasticities, and the $\gamma_{ij}^{i\neq j}$[1] determinants represent cross-price elasticities between a product i and j. The cross-price elasticities,$\gamma_{ij}^{i\neq j}$, represent "102 times the effect on the ith budget share of a 1 per cent increase in the jth price with x/P held constant" (Deaton and Muellbauer, 1980, p. 314).

Due to empirical difficulties to calculate price index (P), Stone's price index (P*), a simplified calculation of price index for the AIDS model, is generally used instead of the Deaton and Muellbauer's original price index (P) (Deaton and Muellbauer, 1980). Deaton and Muellbauer (1980) showed Stone's geometric price index (P*) as follows (Equation 7):

$$\log P^* = \sum_k w_k \log p_k \quad (7)$$

Methodology

The first part of the research utilized time series analysis to compare the US and Japanese apparel markets. The size of markets, household apparel expenditure, domestic apparel production, and amount of apparel imports in the USA and Japan were analyzed from 1995 to 2004. In the second part, the Deaton and Muellbauer's (1980) AIDS model was used to calculate price, income and cross-price elasticities of domestically produced and imported apparel. The elasticities were then used to analyze price and income sensitivity and market positions of domestically produced and imported apparel in the USA and Japan. The US and Japanese AIDS demand functions for domestically produced and imported apparel were calculated by using Equations 8 through 11:

$$w_1 = \alpha_1 + \gamma_{11} \log p_1 + \gamma_{12} \log p_2 + \beta_1 \log\{x/P^*\} \quad (8)$$

$$w_2 = \alpha_2 + \gamma_{21} \log p_1 + \gamma_{22} \log p_2 + \beta_2 \log\{x/P^*\} \quad (9)$$

$$\log P^* = w_1 \log p_1 + w_2 \log p_2 \quad (10)$$

$$w_i = \frac{p_i q_i}{p_i q_i + p_j q_j} \quad (11)$$

The budget share of domestically produced apparel (w1), price of domestically produced apparel (p1), price of imported apparel (p2), Stone's price index (P*), and total apparel expenditure (x) were used to calculate product price elasticity (γ11), income elasticity (β1), and cross-price elasticity of domestically produced apparel compared for imported apparel (γ12) (Equation 8). Similarly, elasticities of imported apparel – price elasticity (γ22), income elasticity (β2), and domestically produced and imported apparel cross-price elasticity (γ21) – were calculated (Equation 9).

Deaton and Muellbauer (1980) noted that the interpretation of demand elasticities depended on whether the coefficients were positive or negative. However, they did not clearly present the distinctive interpretation of price and income elasticities. To complement the Deaton and Muellbauer's conceptualization of demand elasticities, this study used the extended interpretation of price and income elasticities proposed by Lipsey (1989) and Gottheil (2005). If price elasticity (γ11 andγ22) was positive, products were categorized as luxury goods; and products with negative price elasticity were classified as necessities (Table I). Similarly, if income elasticity (β1 andβ2) was positive, the products were classified as high quality goods (quality goods). Goods with negative income elasticity were categorized as low quality goods (inferior goods).

Table 1. Interpretation of price and income elasticities

		Price elasticity (γ_{11} andγ_{22})	
		Negative	Positive
Income elasticity (β_1 and β_2)	Negative	Necessity	Luxury
		Inferior	Inferior
	Positive	Necessity	Luxury
		Quality	Quality

Data collection

Secondary data from the US and Japanese government sources were collected to compare domestic apparel markets in these countries and to estimate price, income and cross-price elasticities. The data included men and women's apparel articles (including boys' and girls'

apparel) without underwear, swimwear, infant wear and accessories from 1995 to 2004. The data were obtained from the following sources: apparel domestic production from Current Industrial Reports, MP‐1, Manufacturing Profiles[2] (US Bureau of Census, 1997‐2006) and Census of Manufacturers, Report by Commodities (Ministry of Economy, Trade and Industry, 1997‐2006); import and export volume and values from Current Industrial Reports, MP‐1, Manufacturing Profiles (US Bureau of Census, 1997‐2006) and Boeki Tokei Database (Trade Statistics Database) (Japan External Trade Organization, 2006); household apparel expenditures from Average Annual Expenditures and Characteristics of All Consumer Units, Consumer Expenditures Survey (US Bureau of Labor Statistics, 1997‐2006) and Japan Statistical Yearbook (Nihon Tokei Kyokai, 1997‐2006); and the nominal exchange rate of the US dollar to the Japanese yen from International Financial Statistics Yearbook to convert Japanese domestic production and trade data in yen to US dollars (International Monetary Fund, 1997‐2006). All data were reported in current dollars (Japan External Trade Organization, 2006; Nihon Tokei Kyokai, 1997‐2006; US Bureau of Census, 1997‐2006; US Bureau of Labor Statistics, 1997‐2006). The price, income and cross‐price elasticities of domestically produced and imported apparel in the USA and Japan from 1995 to 2004 were calculated using least squares approximation (Ott and Longnecker, 2000).

Results

Time series analysis of the US and Japanese apparel markets

Apparel markets in the USA and Japan experienced different trends from 1995 to 2004. The US apparel market expanded greatly over the period, while the Japanese apparel market deflated steadily (Figure 1). The size of the total US apparel market increased significantly from $55 billion in 1995 to $80 billion in 1999 due to the fast growing population and economy (OECD, 2008; United Nations, 2008). During the 2000s, the expansion of the market halted but the size of the market in 2004 was more than 50 per cent larger than that in 1995. The Japanese apparel market steadily decreased in size from $20 billion in 1995 to a little more than $10 billion in 2004, which is believed to be the result of the economic recession (Benson and Debroux, 2004). The gap between the apparel market sizes in the two countries increased substantially during the period under the study and reached more than $60 billion in 2004. It should be noted that the Japanese population (127 million) was close to a half of the US population (307 million), while the size of the Japanese apparel market was only 15 per cent of the US market in 2004 (United Nations, 2008).

Similar to the total apparel market trend, the US and Japanese household apparel expenditure also showed different dynamics during the research period (Figure 2). The household apparel expenditure of the USA remained strong, around $1,700. The household apparel expenditure of Japan, however, rapidly decreased during the late 1990s, from $1,000 to $700. This result shows the influence of the long‐time economic recession in the 1990s on the Japanese household's apparel purchase. Cross nationally, the US household apparel expenditure was more than two times greater than that in Japan.

Figure 1. The US and Japanese total apparel demand, 1995-2004

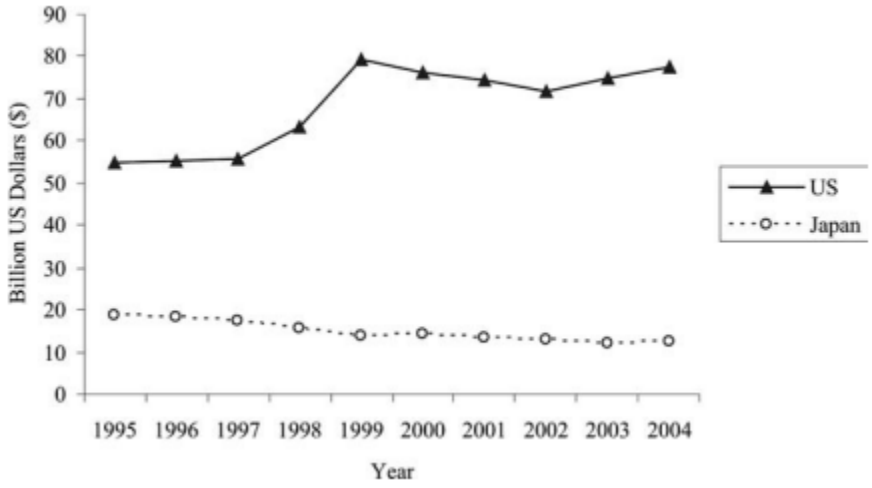
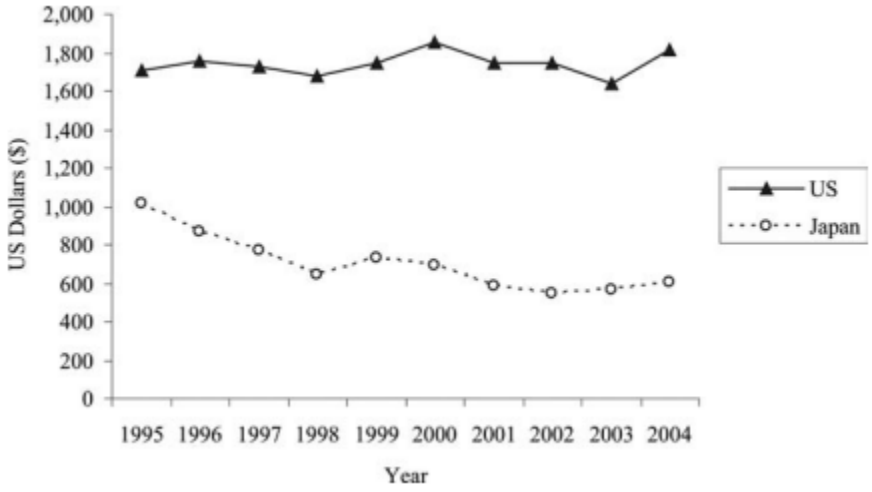


Figure 2. The US and Japanese household apparel expenditures, 1995-2004



Despite the growth of the US apparel market size from $55 billion in 1995 to $75 billion in 2004, domestic apparel production shows a 40 per cent decrease: from $25 to $15 billion (Figure 3). During the same period, the Japanese apparel industry decreased domestic production by 50 per cent, from $10 billion to $5 billion. The decline of the total Japanese apparel market was proportional to the decline in the domestic production (50 per cent). The US apparel market expansion was driven by a rapid increase in the total value of apparel imports (Figure 4). Between 1995 and 2004, the US apparel imports doubled from 30 billion to 60 billion. In contrast, during the same period from 1995 to 2004, the total value of the Japanese apparel imports was sustained at around $7 billion.

In summary, between 1995 and 2004, the US apparel market expanded significantly, which could be explained by the drastic import increase from 30 in 1995 to 60 billion in 2004. At

the same time, the US apparel industry[3] reduced domestic production by 40 per cent. This finding suggests that the US apparel industry did not take advantage of a substantial expansion of the apparel market size but continued to downsize domestic production. Therefore, it can be concluded that the US domestic producers substantially lost market share while the amount of apparel import expanded greatly, which is a base of the industry's claim that imports impaired the US apparel industry significantly (Abernathy and Weil, 2004). Similarly, the size of the Japanese apparel market declined by 50 per cent and Japanese household apparel expenditure dropped by 30 per cent during the same period, but the imports into the market remained at a constant level between 1995 and 2004. Based on this data, it can be concluded that both US and Japanese domestic apparel industries decreased production substantially in the research period, by 50 per cent and 40 per cent, respectively. However, the nature of the decrease was different because the overall market trends showed that the US apparel industry was shrinking while the market was booming and the Japanese apparel industry was shrinking while the market was also shrinking.

Figure 3. Domestic apparel production in the USA and Japan, 1995-2004

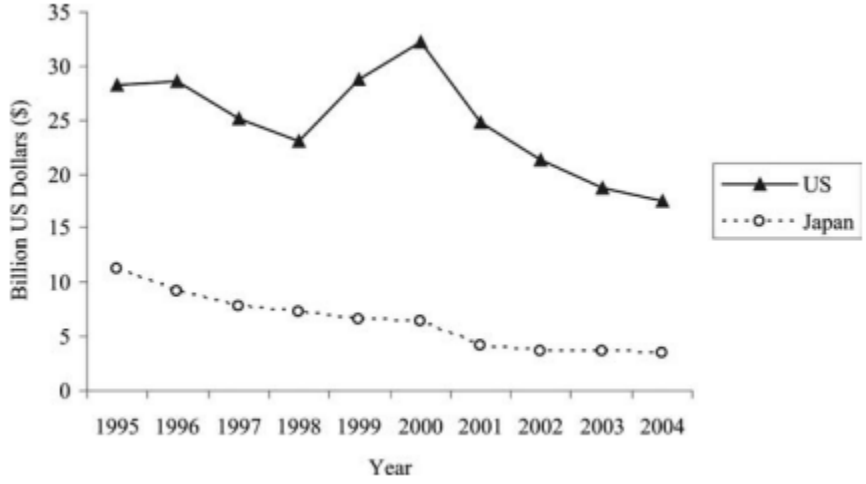
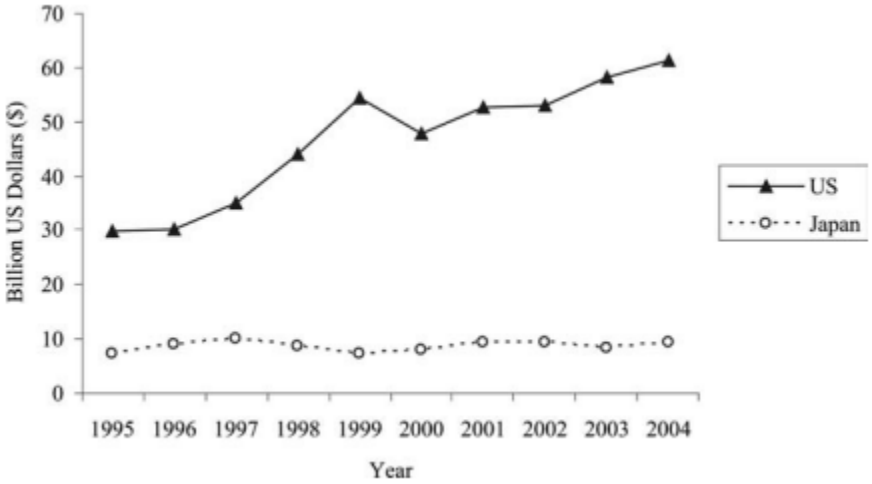


Figure 4. Apparel imports in the USA and Japan, 1995-2004



Results of the AIDS analysis

The results of price, income, and cross-price elasticities may help answer the questions generated from the time series analysis results (Table II). Why did apparel produced in the USA fail to capture the market increase, while imported apparel doubled its market share during the same period? Why did the imported apparel to Japan maintain at the same level, while the domestically produced apparel decreased at the same rate as the Japanese apparel market size? The results show that in the US market both domestically produced and imported apparel have negative price elasticity: −0.48 and −0.30, respectively. This means that the US consumers were price-sensitive because they purchased less both domestically produced and imported apparel when a unit price increased. Moreover, the same rate in price increase of both domestically produced and imported apparel resulted in a 1.5 times greater purchase decrease of apparel produced in the USA (price elasticity of −0.48 for domestically produced apparel and −0-0.30 for imported apparel). Based on the negative price elasticities, we can conclude that the US consumers considered both domestically produced and imported apparel as necessities (Gottheil, 2005) but domestically produced apparel was even less favored by the consumers when its price increased.

The price elasticities of the apparel products in Japan, however, demonstrate that the Japanese consumers reacted differently to product price increase, depending on whether apparel was imported or domestically produced (Table II). The price elasticity of domestically produced apparel in Japan was positive (0.43), while the price elasticity of imported apparel was negative (−1.05). Even with a price increase of domestically produced apparel, the Japanese consumers were willing to purchase more goods. However, they decreased purchase of imported apparel if there was a price increase. Based on the results of the Japanese apparel market analysis, domestically produced apparel can be categorized as luxury products (positive price elasticity) and imported apparel can be categorized as necessities (negative price elasticity).

The income elasticity of demand shows that with an increase in income the US consumers increased purchase of imported apparel (0.18) but decreased purchase of domestic products significantly (−1.64). This may be interpreted that apparel produced in the USA is perceived by the consumers as of lower quality (negative income elasticity) compared to imported apparel being of higher quality (positive income elasticity). In contrast, the income elasticity of the Japanese produced apparel was positive (0.74) while imported apparel had negative and low income elasticity (−2.22). This result may be interpreted as follows: consumers in Japan perceived domestically produced apparel as of higher quality products, whereas imported apparel was perceived as inferior quality products.

Comparison of cross-price elasticities also illustrates different purchasing patterns of domestically produced apparel in the US and Japanese markets (Table II). In the USA, the cross-price elasticity between domestically produced and imported apparel indicates that as imported apparel price increased by 1 per cent, the demand for domestically produced apparel products decreased by 0.66 per cent. For the Japanese market, an increase of imported apparel price by 1 per cent boosted the demand for domestically produced apparel by 1.67 per cent. The cross-price elasticities show that apparel produced in the USA decreased its market share even when imported apparel increased in price. In contrast, the Japanese-made apparel benefited from the price increase of imported apparel.

Analyses of price, income and cross-price elasticities represent comparative market positions and quality of domestically produced and imported apparel in both countries (Figure 5).

Negative price elasticities of both domestically produced and imported apparel in the USA and imported apparel in Japan show that these product groups can be classified as necessities. Only Japanese-made apparel can be classified as luxury products (positive price elasticity). Positive income elasticities of the Japanese-made apparel and imported apparel in the USA indicated that that they can be classified as higher quality products. At the same time, imported apparel in Japan and US-made apparel can be classified as inferior quality products because of negative income elasticities. Overall, the results of cross-price elasticities indicate that in the US market, domestically produced apparel was less preferred by the consumers in comparison to imported apparel. In contrast, in the Japanese market, domestically produced apparel was favored when competing with imported apparel.

Table II. The parameter estimates for price, income, and cross-price elasticities

	USA		Japan	
	Domestic	Imported	Domestic	Imported
Commodity i, j	(Commodity i)	(Commodity j)	(Commodity i)	(Commodity j)
Price elasticity	-0.48	-0.30	0.43	-1.05
Cross-price elasticity i and j	-0.66		1.67	
Income elasticity	-1.64	0.18	0.74	-2.22

Figure 5. Results of price and income elasticities

Conclusions and discussions

Using competitive advantage theory (Porter, 1990) and consumer demand theory (Deaton and Muellbauer, 1980) as the underlying theoretical frameworks, this study utilized the time series analysis and the concept of elasticity of demand to compare market positions of the US and Japanese domestically produced and imported apparel by providing time series analyses of these two apparel markets in terms of total market size, household apparel expenditure, domestic

production, and imports and comparing price and income sensitivity and positions of domestically produced and imported apparel in both markets by analyzing price, income and cross-price elasticities.

The US apparel market increased in size from $55 billion in 1995 to $75 billion in 2004. The Japanese apparel market slowly deflated by 50 per cent, from $20 billion in 1995 to a little more than $10 billion in 2004. The results indicate that the US apparel producers did not take advantage of the substantial growth of the domestic apparel market as the domestic output dropped by 40 per cent between 1995 and 2004. The primary source of the US apparel market expansion was the increase in imported apparel (by 50 per cent). Over the same time period, the Japanese apparel firms decreased production by more than 50 per cent, which was in proportion with the overall market shrinkage. However, apparel imports to the country remained at the same level from 1995 and 2004.

The price, income, and cross-price elasticities results provided a possible explanation of domestic production decrease in the booming market (the USA) and in the recession market (Japan) through an evaluation of domestically produced and imported apparel positions in the USA and Japan (Figure 5). The AIDS results showed that in the USA, domestically produced apparel can be categorized as necessity (negative price elasticity −0.48) of inferior quality (negative income elasticity −1.64), while imported apparel can be categorized as necessity (negative price elasticity −0.30) of higher quality (positive income elasticity 0.18). The two product groups, domestically produced and imported apparel, competed for the same necessity market segment. Lower price elasticity of the US-made apparel in comparison with imported apparel indicates that the US consumers decreased domestic product purchase more rapidly even when there was the same rate in price increase for both products. Furthermore, the lower income elasticity of domestically produced apparel indicates that the US-made apparel was perceived as lower quality in comparison with imported apparel. Cross-price elasticity (−0.66) confirmed that the US-made apparel was losing its consumers even when imported apparel increased in price. The AIDS results offer an explanation for the rapidly decreasing domestic apparel production in the booming US market: demand for the domestically produced apparel was lower than demand for imported apparel because the former was perceived by the consumers as necessity product with a quality level lower than that of imported apparel.

In Japan, however, domestically produced apparel can be categorized as luxury product (positive price elasticity 0.43) of high quality (positive income elasticity 0.74), while imported apparel – as necessity product (negative price elasticity −1.05) of low quality (negative income elasticity −2.02). The Japanese apparel market was clearly divided between domestically produced and imported apparel as they were competing for different market segments. Domestically produced apparel was perceived as higher quality, luxury products while imported apparel occupied lower end, basic necessity niche. Cross-price elasticity (1.67) proved that the Japanese consumers switched their purchase to domestic products when imported apparel increased in price. This result offers an explanation why the level of imported apparel remained stable and did not increase over the ten-year period.

The AIDS analysis results pointed to an important difference between the US and Japanese apparel demand conditions. Negative price elasticities for domestic and imported products indicate that the US consumers were price-conscious in purchasing apparel. In contrast, the Japanese consumers increased the purchase of higher quality domestically produced apparel but decreased the purchase of low quality imported apparel when the product price increased.

Using the case of the US and Japanese apparel industries, this research provided an

empirical support for the Porter's competitiveness theory's proposition that market demand is an important factor that contributes to the competitiveness of a national industry. Our findings indicate that price sensitivity of the US consumers shaped the US apparel domestic market to keep product price low rather than to increase its quality with respective increase in price. As the result, the price conscious nature of the US apparel market created less room for the US apparel industry to develop production with a focus on quality, higher end products. Instead, the US apparel industry continued to focus on basic, lower quality, low cost necessities in an attempt to compete with inexpensive imports. Such strategy, triggered by the demand factor, became one of the reasons for decreasing industry competitiveness when the market was booming. The Japanese consumer's preference for higher quality, luxury apparel and willingness to pay for it encouraged domestic producers to focus on these types of products. This allowed the Japanese apparel industry to differentiate the output from lower quality imported apparel and, ultimately, contributed to maintaining industry competitiveness. In other words, demand of the sophisticated Japanese consumer for higher‐end apparel contributed to the domestic industry competitiveness.

The results of elasticity of demand analyses for both countries are consistent with Fernie and Azuma's (2004) argument that the US apparel industry focuses on basic apparel items and competes on price, while the Japanese apparel industry is specialized in producing higher‐end apparel of superior quality. This result of the Japanese case supports Hirai's (2004) viewpoint that the Japanese apparel market is distinctively divided into high fashion market and low quality necessity market. Our finding also supports Arpan et al. (1982) and Blinder's (1990) suggestions that the US apparel industry was less competitive than foreign producers in capturing demand of the domestic consumer.

The scope of this study in assessing the competitiveness of two national apparel industries is limited to only one factor from the Porter's theory: the conditions of market demand. The investigation of other factors, such as context for firm strategy, structure, and rivalry, factor conditions, and related supporting industries in conjunction with the demand factor (Porter, 1990) should be conducted for a more complete understanding of how domestic industry competitiveness is developed and maintained. Future research could expand to include other factors affecting the apparel industry competitiveness in developed courtiers. The framework for the apparel industry competitiveness assessment with regard to the demand‐side analysis of Porter's competitiveness theory can be applied to other markets.

Notes

1. The restrictions imposed to this system are gij ¼ gji (Deaton and Muellbauer, 1980).
2. In Current Industrial Reports, MP-1, Manufacturing Profiles (US Bureau of Census, 1997-2006), only process that was operated inside the USA was counted as domestic shipments. Therefore, the production from the 9802 Program (formerly 807 Program), was not counted in domestic shipments but included in import statistics (US Bureau of Census, 2004).
3. The size of domestic market is calculated by total domestic production minus export plus import.

References

Abernathy, F. and Weil, D. (2004), “Apparel apocalypse? The Americas’ textile industries won’t

die when quotas do", Washington Post, 18 November.
Adner, R. and Zemsky, P. (2006), "A demand-based perspective on sustainable competitive advantage", Strategic Management Journal, Vol. 27, pp. 215-39.
Arpan, J.S., Torre, J.D.L. and Toyne, B. (1982), The US Apparel Industry: International Challenge, Domestic Response, Business Publishing Division, Georgia State University, Atlanta.
Benson, J. and Debroux, P. (2004), "The changing nature of Japanese human resource management: the impact of the recession and the Asian financial crisis", International Studies of Management and Organization, Vol. 34 No. 1, pp. 32-51.
Besley, T. (1989), "A definition of luxury and necessity for cardinal utility functions", The Economic Journal, Vol. 99 No. 397, pp. 844-49.
Blinder, A.S. (1990), Maintaining Competitiveness with High Wages, ICS Press, San Francisco, CA.
Bruce, M., Daly, L. and Towers, N. (2004), "Lean or agile: a solution for supply chain management in the textiles and apparel industry?", International Journal of Operations and Production Management, Vol. 24 No. 2, pp. 151-70.
Cheshire, P. and Sheppard, S. (2002), "The welfare economics of land use planning", Journal of Urban Economics, Vol. 52 No. 2, pp. 242-69.
Datta, A. and Christoffersen, S. (2005), "Production costs, scale economies, and technical change in US textile and apparel industries", Atlantic Economic Journal, Vol. 33 No. 2, pp. 201-13.
Deaton, A. and Muellbauer, J. (1980), "An almost ideal demand system", The American Economic Review, Vol. 70 No. 3, pp. 312-26.
Dickerson, K.G. (1999), Textiles and Apparel in the Global Economy, 3rd ed., Merrill/Prentice-Hall, Englewood Cliffs, NJ. Dorfman, R. (1991), "Review article: economic development from the beginning to Rostow", Journal of Economic Literature, Vol. 29 No. 2, pp. 573-91.
Dubois, B. and Duquesne, P. (1993), "The market for luxury goods: income versus culture", European Journal of Marketing, Vol. 27 No. 1, pp. 35-44.
Eastwood, D.B. (1985), The Economics of Consumer Behavior, Allyn & Bacon, Boston, MA.
Fadiga, M.L. and Mirsa, S.K. (2005), "US consumer purchasing decisions and demand for apparel", Journal of Fashion Marketing and Management, Vol. 9 No. 4, pp. 367-79.
Fernie, J. and Azuma, N. (2004), "The changing nature of Japanese fashion: can quick response improve supply chain efficiency?", European Journal of Marketing, Vol. 38 No. 7, pp. 790-808.
Gottheil, F. (2005), Principles of Microeconomics, Thompson Publishing, Mason, OH.
Grant, R.M. (1991), "Porter's competitive advantage theory of nations: an assessment", Strategic Management Journal, Vol. 12 No. 7, pp. 535-48.
Hirai, T. (2004), "Jiyoubouekikyoutei(FTA)to wagakunino seni apareru sangyo (Free trade agreement and Japanese textile industry)", Kaetsu University Research Review, Vol. 47 No. 1, pp. 17-30.
Hughes, J.P., Lang, W., Mester, L.J. and Moon, C.G. (2000), "Recovering risky technologies using the almost ideal demand system: an application to US banking", Journal of Financial Services Research, Vol. 18 No. 1, pp. 5-27.
International Monetary Fund (1997-2006), International Financial Statistics Yearbook, (English ed.)., International Monetary Fund, Washington. DC.

Japan External Trade Organization (JETRO) (2006), Boeki Tokei Database (Trade Statistics Database), 20 February 2006, available at: www3.jetro.go.jp/cgi-bin/nats/cgi-bin/search.cgi (accessed 19 September 2006).
Kanamori, H. (1988), Nyumon nihon keizai (Introduction to Japanese Economy), Chuo Keizaisha, Tokyo.
Kemp, S. (1998), "Perceiving luxury and necessity", Journal of Economic Psychology, Vol. 19 No. 5, pp. 591-606.
Lam, J.K.C. and Postle, R. (2006), "Textile and apparel supply chain management in Hong Kong", International Journal of Clothing Science and Technology, Vol. 18 No. 4, pp. 265-77.
Lewbel, A. (1989), "Household equivalence scales and welfare comparisons", Journal of Public Economics, Vol. 39, pp. 377-91.
Library of Economics and Liberty (2008), "Alfred Marshall", The Concise Encyclopedia of Economics, available at: www.econlib.org/library/bios.Marshall.html (accessed 7 February 2010).
Lipsey, R.G. (1989), An Introduction to Positive Economics, Weidenfeld and Nicolson, London.
Marshall, A. (1895), Principles of Economics, Macmillan, London.
Ministry of Economy, Trade and Industry (1997-2006), Census of Manufacturers, Report by Commodities, Ministry of Economy, Trade and Industry, Statistics Bureau, Tokyo.
Murray, L.A. (1995), "Unraveling employment trends in textiles and apparel", Monthly Labor Review, August, pp. 62-72.
Nevo, A. (2000), "A practitioner's guide to estimation of random-coefficients logit models of demand", Journal of Economics Management Strategy, Vol. 9, pp. 513-48.
Nihon Tokei Kyokai (1997-2006), Japan Statistical Yearbook, Japan Statistical Association, Tokyo.
OECD (2008), OECD.stat extracts, available at: http://stats.oecd.org/wbos/Index.aspx?datasetcode=SNA_TABLE1 (accessed 11 March 2009).
Ott, L.R. and Longnecker, M.T. (2000), An Introduction to Statistical Methods and Data Analysis, Duxbury Press, Belmont, CA.
Papatheodorou, A. (2001), Why People Travel to Different Places, University of Oxford, Oxford.
Pavlou, A. and Slawy, O.A. (2004), "From IT competence to competitive advantage in turbulent environments: a dynamic capabilities model", Information Systems Research, Vol. 7 No. 3, pp. 198-227.
Porter, M.E. (1990), Competitive Advantage of Nations, Free Press, New York, NY.
Ricardo, D. (1962), On the Principles of Political Economy and Taxation, Cambridge University Press, Cambridge.
Scheller, H.P. and Kunz, G.I. (1998), "Toward a grounded theory of apparel product quality", Clothing and Textiles Research Journal, Vol. 16 No. 2, pp. 57-67.
Smith, A. (1937), An Inquiry into the Nature and Causes of the Wealth of Nations, Modern Library, New York, NY.
Sullivan, P. and Kang, J. (1999), "Quick response adoption in the apparel manufacturing industry: competitive advantage of innovation", Journal of Small Business Management, Vol. 37 No. 1, pp. 1-13.
Teng, S.G. and Jaramillo, H. (2006), "Integrating the US textile and apparel supply chain with small companies in South America", Supply Chain Management: An International Journal, Vol. 11 No. 1, pp. 44-55.

United Nations (2008), "World population prospects", available at: http://esa.un.org/unpp (accessed 11 March 2009).
US Bureau of Census (1997-2006), Current Industrial Reports, MP-1, Manufacturing Profiles, US Department of Commerce, Economic and Statistics Administration, US Bureau of Census, Washington DC.
US Bureau of Census (2004), "Guide to Foreign Trade Statistics", available at: www.census.gov/foreign-trade/guide/sec2.html#returns (accessed 14 December).
US Bureau of Labor Statistics (1997-2006), Average Annual Expenditures and Characteristics of all Consumer Units, Consumer Expenditures Survey, US Dept, of Labor Bureau of Labor Statistics, Washington DC.
Verbeke, W. (2001), "A fresh meat almost ideal demand system incorporating negative TV press and advertising impact", Agricultural Economics, Vol. 25 Nos 2-3, pp. 359-74.
Wagner, J. and Mokhtari, M. (2000), "The moderating effect of seasonality on household apparel expenditure", Journal of Consumer Affairs, Vol. 34 No. 2, pp. 314-29.
Yoshimatsu, H. (2000), Internationalization, Corporate Preferences and Commercial Policy in Japan, St Martin's Press, New York, NY.

Further reading

Green, R. and Alston, J.M. (1990), "Elasticities in AIDS models", *American Journal of Agricultural Economics*, Vol. 72 No. 2, pp. 442-5.

About the authors

Juyoung Lee is a PhD student in the Department of Apparel, Educational Studies, and Hospitality Management, Iowa State University. Juyoung Lee is the corresponding author and can be contacted at: jill80@iastate.edu

Elena E. Karpova is an Assistant Professor in the Department of Apparel, Educational Studies, and Hospitality Management, Iowa State University. Dr Karpova has years of experience in the industry and teaching at university level both in Russia and the USA. Her major research interests include: global textile and apparel industries, trade, and markets; and preparation of global citizens for careers in the apparel industry, with a focus on creative problem solving and cross-cultural virtual collaboration.