Comparative advantages of the Indian and Chinese apparel industries: an analysis of the global value chain

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The research investigated comparative advantages of the Indian and Chinese apparel industries by evaluating each industry’s performance. The investigation employed the global value chain framework. A wide range of secondary data were used from the Indian, Chinese and international databases. The data were synthesised and analysed at the level of each component of the global value chain: textile materials supply, manufacturing, transportation and logistics services, and marketing. The study revealed that the Chinese apparel industry had comparative advantages in the following: material supply in the MMF sector; full-package production and lean/agile manufacturing; and efficient transportation and logistics services. The Indian apparel industry had comparative advantages in: lower labour costs, production differentiation and specialisation, flexible manufacturing, and marketing. Disadvantages in the Chinese and Indian apparel industries were also identified respectively. Industrial upgrading opportunities and recommendations for each industry’s future development were formulated. Implications for potential trends of the global apparel industry were also explored.

Keywords: China; India; comparative advantage; global value chain; industrial upgrading

Introduction

After elimination of the quota system in 2005, the global apparel industry has been under major reconstructions, due to the drifting comparative advantages among countries (Tewari 2008). The notion of comparative advantage addresses a competing advantage a country possesses in a global industry relative to other countries (Kogut 1985). To date, two types of studies have analysed comparative advantage in the context of the global apparel industry. The first group focuses on comparison between developing and developed countries, also known as exporting and importing countries (e.g. Nordas 2004). The second group compares industry performance between exporting countries that have significant differences, e.g. Mexico vs. China (ADB 2006, Kaplinsky and Morris 2008). Very few studies have compared the Chinese and Indian apparel industries. Instead, given their geographic proximity and global leadership in apparel manufacturing, the countries are often aligned together (e.g. Gereffi and Frederick 2010, Seyoum 2010). However, it is important to understand comparative advantages of the Chinese and Indian apparel industries as both have distinct strengths and weaknesses rooted in historical, institutional, economical, social and cultural affairs (Tewari 2005).

The purpose of this study was to investigate comparative advantages of the Indian and Chinese apparel industries. In particular, we aimed to provide insights into the following critical issues. What are relative strengths and weaknesses of the two industries? What are the opportunities and threats for each industry’s future development? Is it likely that India will replace China and become the world’s largest exporter, as scholars have projected (Ishtiaque 2005, BharatTextile 2008)? What are the implications for the present and future structure of the global apparel industry?

The investigation was structured using the global value chain (GVC) framework. GVC is based on functional integrations between geographically dispersed activities for designing, manufacturing and marketing a product (Gereffi and Memedovic 2003). To achieve comparative advantage, countries must perform one or more value-generating activities that in a way create greater overall values than competing countries (OECD 2007). By examining the Chinese and Indian apparel industries’ performance in each of the components of the apparel GVC, comparative advantages of the two industries were revealed.

The investigation of comparative advantages of the Chinese and Indian apparel industries was warranted...
for several reasons. First, China and India are two of the world’s largest apparel manufacturers and in many cases determine the dynamics of global apparel sourcing (AllBusiness 2005, CNTAC 2006). A comparison between the two contributes to an in-depth understanding of the current position of the major apparel suppliers and helps project the future structure and dynamics of the global apparel industry. Second, although the perspectives of comparative advantage and GVC are interrelated and complementary to each other (OECD 2007), extant research has primarily examined the global apparel industry from either comparative advantage (Jin and Moon 2006, Kilduff and Chi 2006) or GVC (Gereffi and Memedovic 2003, Nordas 2004). This study is the first attempt to explicitly combine these two perspectives to investigate the Indian and Chinese apparel industries, which may open new methodological opportunities and insights for evaluating other national apparel industries. Third, research findings can assist both the Indian and Chinese policy makers in forming industrial regulations and strategies, as well as help individual apparel companies in leveraging their businesses to the higher end of the value chain.

The paper was organised in the following parts. First, three streams of literature were reviewed: GVC, comparative advantage and background of the Indian and Chinese apparel industries. After the discussion of methodology, performance of the two industries in each component of the GVC was examined, employing a wide range of secondary data. Third, the comparative advantages of the Indian and Chinese apparel industries were outlined. Finally, implications and future research directions were discussed.

Literature review

Global value chain

GVC implies functional integration between internationally dispersed activities pertaining to a specific product, including design, production, transportation and distribution with each activity being carried out wherever the necessary skills and materials are available at a competitive cost and quality (Gereffi and Memedovic 2003, Palpacuer et al. 2006). By analysing the geography and organisation of a global industry using the GVC framework, it becomes explicit where and by whom value is created and distributed (Bair and Peters 2006). A key element of GVC analysis is governance patterns, which denote firms’ leadership in the chain, i.e. defining the terms of including/excluding other firms, and allocating to them activities that lead firms do not wish to perform (Ponte and Gibbon 2005). Lead firms are distinguished from their followers or subordinates because they control access to major resources that generate most profitable returns in an industry (Gereffi 2002).

Fundamentally, GVCs can be distinguished between the buyer-driven and producer-driven governance patterns (Gereffi 2002). In the producer-driven GVC, large transnational manufacturers exert control over backward linkages with raw materials and component suppliers, and forward linkages into distribution and retailing, e.g. GVCs in capital and technology intensive industries such as automobiles, aircraft and computers. In the buyer-driven GVC, on the other hand, large retailers, marketers and branded manufacturers play the pivotal roles in setting up decentralised production networks in a variety of exporting countries, typically located in developing countries (Gereffi 2002). Examples of buyer-driven GVCs include GVCs in labour intensive and consumer goods industries, such as the apparel and consumer electronic industries. Examining the governance pattern of a GVC provides insight into the distribution of resources and gains, as well as insight into cooperation forming between firms in the industry (Ponte and Gibbon 2005).

The global apparel value chain comprises four components: textile materials supply; manufacturing of finished products; transportation services and logistics; and marketing (Gereffi and Memedovic 2003). In line with Gereffi and Memedovic (2003), this study considers brand development and retail distribution as core indicators of an apparel firm’s marketing competence. Each of these four specialised components (1) requires different labour skills and conditions, technology, and scale and type of enterprises; (2) generates different value-added to the final product and (3) defines the level of market control of the involved firms (Gereffi and Memedovic 2003, Nordas 2004). For example, marketing activities are characterised by higher value-added and greater market control (Kogut 1985). On the other hand, labour-intensive activities in the GVC such as cut, making and trim generate the lower value-added and market control for the involved firms (Gereffi 2001).

The apparel industry is an ideal example of a GVC with the buyer-driven governance (Gereffi 1994). In the apparel GVC, lead firms are marketers and merchandisers at the design and retail ends of the chain, and typically from developed countries (Gereffi 2002). For example, marketers and retailers possess the foremost design skills, the lavish advertising budgets and promotional campaigns required to create and sustain global brands, and the sophisticated and costly information technologies (ITs) for increasing revenues and lowering risks. This explains why these companies became leader firms in apparel GVCs. Thus, leader
firms in the apparel GVC exert substantial control over the recourse and profit distribution in the industry, by controlling higher value-added activities (such as design, branding and retailing) (Gereffi and Frederick 2010).

Two trends in the apparel GVC are worth noting. There have been sequential relocations of apparel production from the USA and Western Europe to Japan, the Asian newly industrialised economies and then to developing nations in South East and Southern Asia, including China and India. Each new tier of entrants had significantly lower wage rates than its predecessor (Kilduff and Chi 2006). Second, there has been an upgrading trend among apparel suppliers in developing countries from providing basic assembly to offering more flexible and efficient services, such as full-package production and lean or agile manufacturing (Gereffi 2001, Abernathy et al. 2006).

Comparative advantage

Comparative advantage refers to a competing advantage a country possesses in a particular industry relative to other countries (Kogut 1985). The comparative advantage theory, first introduced by David Ricardo in 1817, proposed that nations should engage in those activities for which their advantages over others are the largest or their disadvantages are the smallest (Bouare 2009). Many researchers attempted to further explain national comparative advantage for various industries. For example, Porter (1990) used the diamond of national advantage framework to illustrate the determinants of a national industry’s comparative advantage, including factor conditions (the availability of resources and skills), demand conditions of the local market, the strength of related and supporting industries, and local firm strategy, structure and rivalry. Other researchers have focused on refining quantitative measurements of comparative advantage for a specific industry (De Benedictis and Tamberi 2001, Bouare 2009). For example, a widely acknowledged approach is the revealed comparative advantage (RCA) index that is based on the assumption that the commodity pattern of trade reflects inter-country differences thus revealing the comparative advantage of trading countries. More specifically, the RCA index is calculated by dividing a country’s export share in an industry sector by the sum of the country’s export shares in all industry sectors (De Benedictis and Tamberi 2001).

Comparative advantage is central to global competition as it indicates where a GVC activity should be located when many countries can conduct the whole or part of the activity, i.e. in those countries that are most competitive in completing it (Kogut 1985). This study uses the GVC framework to explain comparative advantages of the Chinese and Indian apparel industries. Because each activity in the global apparel value chain generates different levels of value-added and market control, countries’ competing advantages vary by the type of activities they participate in. First, the more higher value-added activities a national industry is capable of in the apparel GVC, the greater comparative advantage the country would have (OECD 2007). Second, countries can enhance their comparative advantages through industrial upgrading by gearing towards higher value-added activities (Palpacuer et al. 2006).

The Indian and Chinese apparel industry

The apparel industry is vital to both India and China’s national economies, contributing significantly to export earnings, gross domestic product (GDP) and national employment (Table 1). Each of the two countries has a competitive apparel industry with strong domestic raw material supply, abundant low-cost workforce and the traditional focus on the textile and clothing sector (Kaplinsky and Morris 2008). China has been the world’s leading apparel manufacturer since 2001 (Dutta 2008), while India’s apparel industry has shown an impressive development since the mid-1980s with an average annual growth rate of 17% from 1985 to 2005 (Texmin 2008a).

Despite the geographic proximity and leading roles in the global apparel production, the Indian and Chinese apparel industries differ notably in historical development and institutional structure. The Chinese apparel industry has been developing gradually since the 1950s, with enormous changes taking place from 1978, when the country first opened its markets to

| Attribute                                      | India          | China          |
|-----------------------------------------------|----------------|----------------|
| Net exports, world rank                       | 4th ($11 billion) | 1st ($117 billion) |
| Contribution to the national export earnings  | 6%             | 8%             |
| Contribution to the national industrial employment | 18%        | 16%            |
| Contribution to the national GDP              | 4%             | 5%             |
| Contribution to the world apparel exports     | 7%             | 34%            |
| Number of apparel manufacturing companies     | 29,000 (all firms) | 53,000 (revenue > $0.7 million)

Note: Sources: ITC 2010, CNTAC (2010), Texmin (2010a).
foreign investors (Abernathy et al. 2004). Since then, the Chinese government implemented a series of policies to encourage foreign direct investment and enhance the competitiveness of Chinese apparel firms by promoting competition and reforming government-owned enterprises (ADB 2006).

In comparison to China, the development progress of the apparel industry in India has been much slower. Throughout the late 1960s, 1970s and early 1980s, the Indian government implemented a variety of regulatory mechanisms to focus the industry on the domestic market and control the size, location, scale, growth and expansion of apparel firms (Tewari 2005). For example, based on the country’s small scale unit (SSI) policy, the apparel sector in India has been dominated by small establishments. The results of these policies were severe: highly fragmented industry structure, inadequate technology adoption, inability to employ economies of scale principle and slow international integration (UNITC 2001). However, with the government’s deregulation of the apparel industry since 1985, these drawbacks have been increasingly addressed and the industry has seen a fast growth along with impressive export expansions (COI 2001, Tewari 2008).

When assessing the Indian and Chinese apparel industries, it is important to mention the phase out of the Multi-Fibre Arrangement (MFA) quota system and its impact on the two industries (for discussions of MFA quotas and their phase out, see Gereffi and Frederick 2010, Nordas 2004, Tewari 2005, Eve et al. 2008, Adhikari and Yamamoto 2008). Experts projected that China would emerge as the ‘supplier of choice’ for the world’s largest retailers and buyers after quotas – followed by other large suppliers, such as India (Tewari 2005). These predictions have been generally supported by apparel exports data of the Chinese and Indian apparel industries from 2000 to 2009 (Figure 1). For example, both industries have witnessed significant and continuous export increases after 2005 (despite the safeguards imposed on China by the USA and EU in summer 2005) (Adhikari and Yamamoto 2008).

While the elimination of quota system has brought significant opportunities for both countries, the competition between India and China in the textile and apparel sector has been increasingly intensifying (Dutta 2008). In particular, China is projected to gradually lose certain advantages due to its currency appreciation and the continuing increase of production costs, whereas India has a great potential to improve its competitiveness, particularly in the light of moving away from the SSI policy (Ishtiaque 2005). Although it is commonly agreed that China will continue to be the world’s leading apparel producer for the next few years, India is considered to be the next logical winner and, possibly, may even overtake China in this global race (Dutta 2008). By evaluating India’s and China’s performance on each component of the apparel GVC, this study analysed comparative advantages of each country’s apparel industry and, based on the results of the analyses, projected the future development of the two industries.

Methodology

To compare each industry performance in the apparel GVC, secondary data analysis was chosen, given its advantages of getting information regarding a particular area where the direct collection of data is impossible or difficult (Huck 2007). A variety of data was collected to conduct a comprehensive comparison between the Indian and Chinese apparel industries. Data for each country were collected and analysed separately for each component of the apparel GVC. In particular, the Ministry of Textiles of India (Texmin) and Census of India (COI) were consulted for India’s apparel industry’s statistics, including industrial output, employment, and relevant labour statistics. Similar apparel industry statistics were primarily obtained from the National Bureau Statistics of China (NBSC) and China National Textile and Apparel Council (CNTAC). In addition to the above data from the governmental and national organisations, databases from international organisations were broadly used. The United States International Trade Commission (USITC) and International Trade Organization’s (ITO) databases were used for obtaining information related to China’s and India’s international trade activities, such as exporting and importing of textile and apparel, as well as logistic services.

In addition to the information from official databases, other supporting secondary information was acquired by referring to a wide range of governmental publications and existing scholarly literature. Industrial reports, such as Organization of

Figure 1. Apparel export by the Chinese and Indian apparel industries, 2000–2009.
Note: Source: Comtrade database.
Economic Co-operation and Development (OECD), World Bank and Li and Fung Group were valuable for acquiring descriptive information, such as data on industrial integrations, diversity of fabric supplies and production competency. Lastly, news websites, such as Allbusiness, BharatTextile and Fiber2Fashion, were highly relevant and contained most recent information about each country’s apparel industry; in particular, they often provided insightful opinions and perspectives of industry professionals. The data collected from all sources were synthesised and used to compare the two industries, using GVC as a conceptual framework.

Results
In this section, the Indian and Chinese apparel industries’ performance on each component of the apparel GVC (textile materials supply, manufacturing, logistics and marketing) is analysed. Implications of research findings for each country’s comparative advantages and future development are discussed in the next section.

Textile materials supply
It is advantageous for apparel manufactures to have an abundant, inexpensive and high-quality in supply of textile materials near their production units (Tewari 2005). Three aspects of supply of textile materials are discussed below: quantity, cost, and quality and diversification.

Quantity
China and India are the world’s largest textile producers with massive natural resources and manufacturing bases, covering activities ranging from producing various natural and man-made fibres (MMF) to manufacturing diverse fabrics (USDA 2006). India has a strong tradition in cotton production, which in 2009 accounted for about half of India’s total fibre production (Texmin 2010b). In 2008, the country replaced the USA and became the world’s second largest cotton producer after China (Texmin 2010a). India is ranked as number one in the world’s jute production, number two in producing raw silk, number five in MMF production and number eight in the wool global market (Texmin 2008b). Similar to India, China also has long-standing traditions in cotton and silk production (Texmin 2008b). However, the country shows a significant superiority in MMF production in comparison to India (CNTAC 2008). Overall, China is leading in production quantities in all but one major fibre categories by a significantly large amount, as illustrated in Table 2.

|                | China | Rank | India | Rank | World |
|----------------|-------|------|-------|------|-------|
| Wool (kg)      | 380   | 2    | 45    | 8    | 2164  |
| Cotton (’000 tons) | 5973 | 1    | 4590  | 2    | 24,922 |
| Raw silk (tons) | 102,560 | 1    | 16,500 | 2    | 12,5605 |
| Jute (’000 tons) | 90   | 3    | 1575  | 1    | 2826  |
| MMF (’000 tons) | 12,188 | 1    | 1679  | 5    | 34,585 |
| Viscose (’000 tons) | 909  | 1    | 227   | 3    | 2069  |
| Polyester (’000 tons) | 4790 | 1    | 614   | 6    | 10,346 |
| Acrylic (’000 tons) | 798  | 1    | 112   | 7    | 2632  |
| Synthetic (’000 tons) | 5691 | 1    | 726   | 3    | 19,538 |

Note: Source: Texmin (2008b).

Costs
The cost of yarn and fabric has a direct impact on the final cost of apparel products. Countries that provide domestic yarns and fabrics at lower cost have an advantage over those with higher cost of the same quality (Abernathy et al. 2006). Table 3 compared the cost of a wide range of fibres and fabrics in India and China. Except for the textured yarn and woven textured yarn fabric, the costs are noticeably less expensive in China than in India. This indicates India’s advantage over China in terms of cost for supply of textile materials. Yet, the lower cost of textured yarn in China, which is often used for MMF (Kadolf and Langford 2009), demonstrates China’s advantage in the MMF sector.

|                | India (US$) | China (US$) |
|----------------|-------------|-------------|
| Ring-yarn (per kg yarn) | 2.130       | 2.890       |
| O-E yarn (per kg yarn)  | 1.520       | 2.280       |
| Textured yarn (per kg yarn) | 1.770     | 1.740       |
| Woven ring yarn fabric (per kg yarn) | 0.627    | 0.740       |
| Woven O-E yarn fabric (per kg yarn) | 0.595   | 0.748       |
| Woven textured yarn fabric (per kg yarn) | 0.496   | 0.471       |
| Knitted ring yarn fabric (per square metre of fabric) | 0.511 | 0.692       |
| Knitted O-E yarn fabric (per square metre of fabric) | 0.568 | 0.846       |
| Knitted textured yarn fabric (per square metre of fabric) | 0.421 | 0.428       |

Note: Source: Texmin 2010b.
Quality and diversification

The quality of India’s textile products was severely damaged by its SSI and inwardly focused policy (USITC 2001). Until the late 1980s’ economic reforms, a majority of textile firms (80%) were small operations, with less than 20 machines (USDA 2005). Firms’ limited financial resources had not only precluded production quality improvements but also prevented them from manufacturing certain fabrics that required a higher level of capital investment and technology (Verma 2002). The situation is noticeably worse in the MMF sector (USDA 2005), where firms typically rely on outdated technology and do not have the capacity to perform dyeing, processing and finishing of fabrics to international quality standards (Chandra 2005). Yet, having sufficient MMF supply is critical for an apparel industry’s global competition, given that MMFs are projected to be the dominant fibres in global apparel production (Nordas 2004).

In contrast, China is fairly competent in producing quality textiles because of the country’s deregulation policy and associated foreign investments and technology diffusion (Vaidya et al. 2007). China is noted as being able to ‘retain a (competitive edge) in high-quality and capital-intensive segments of the textile industry, such as expensive man-made fabrics …’ (ADB 2006, para 3). A similar assessment was provided in a recent report by the US International Trade Commission: China is capable to ‘make almost any type of textile and apparel product at any quality level at a competitive price’ (USITC 2001, p. 73). Diversification of the Chinese domestic textile supply is particularly evident. The country’s textile industry was ranked by the World Trade Organization as having the world’s eighth highest product diversification, whereas India had only the 31st (ITC 2010).

Manufacturing

From the perspective of the GVC, the key criteria that affect manufacturing competitiveness in the post-quota world are labour cost and productivity, manufacturing competence and adaptability, and full-package production (Abernathy et al. 2004, Gereffi and Memedovic 2003). These factors are analysed next.

Labour cost and productivity

In apparel manufacturing, labour cost has a significant impact on buyers’ decisions and, as a result, has a direct impact on a national apparel industry’s competitiveness (Abernathy et al. 2006). Wages in the apparel industry are lower in India than in China: in the former, the labour cost per hour in 2008 was US$0.51, whereas in China, the labour cost was between US$0.68 and US$1.08 (Emergingtextiles 2008). However, caution has to be exercised when interpreting India’s lower wages. Due to relatively outdated technology and limited economies of scale, the average output per worker in the Indian apparel industry is about 54% lower than that in China (UNITC 2001, Joshi and Singh 2010). Therefore, when accounting for productivity, it turns out that Indian apparel manufacturers are effectively paying higher wages than Chinese apparel producers. In addition, India’s labour laws and regulations lack flexibility and are burdensome to manufacturers, which further sets off the country’s advantage in lower wages (Tewari 2004).

It is important to notice that labour cost is increasing in both China and India. However, a comparison between the two shows that a higher rate of wage increase is observed in China (Figure 2). The fast rising labour cost has eroded the benefits of apparel manufacturing in China and is often used to explain the recent shifts of production out of the country to locations with lower wages (Bloomberg 2009). For instance, an increasing number of apparel firms revealed plans to relocate their operations from China to other countries with lower labour cost, for which India was an appealing candidate (Fiber2Fashion 2005a). In addition, China has just implemented a new labour law. As viewed by experts, the new law would further increase labour costs due to the requirements to improve employee benefits, such as social fees, and unionisation conditions (Shen 2008).

Manufacturing competence and quality

India and China both have highly skilled apparel workforces capable of manufacturing a wide range of quality products (USITC 2001). Both apparel industries strive to increase competitiveness by (1) diversifying product offerings and (2) manufacturing quality products with higher unit values (Tewari 2005, Shen 2006).
For example, the average unit value of both industries’ apparel exports has been steadily increasing (Figure 3). In India, due to its long traditions and specialisation in handcraft industries, there is a well-established labour pool for manufacturing products with intricate embellishments such as beading, embroidery and complex patterns (Tewari 2005). Importers who source from India often express their satisfaction with unique designs and handwork, which they cannot find in China, or in any other country (Williamson 2005). Historically, the small scale of operations in the Indian apparel industry ‘created conditions for the preservation of the master tailors’ who are willing and capable of doing intricate designs involving complex patterns and a variety of fabrics, colours and types of embellishments (Tewari 2005, p. 33). These master tailors have formed a key segment of the Indian apparel workforce, in contrast to the ‘line workers’ in China (Tewari 2005, p. 33). These advantages in manufacturing competence not only endows the Indian apparel industry with a high capability in production differentiation but also might explain the higher unit values of the Indian apparel exports in comparison to China (Figure 3).

In China, due to the pressure of rising production cost and the government’s latest policy to stimulate higher value-added exports, an increasing number of small apparel manufacturers have been focusing on product quality and moving up to higher end manufacturing (Bowerman and Bachmann 2008). For example, mid-to-high end products have reached nearly 50% of the Chinese entire apparel exports in 2008 (CNTAC 2008). The country’s recent development in manufacturing competency has changed its image of a nation capable of producing only low quality apparel and increasingly attracts high-profile luxury brands such as Burberry and Louis Vuitton that move production plants from Europe to China (Bowerman and Bachmann 2008).

### Manufacturing adaptability

Given the increasingly volatile global apparel market demand, traditional factors such as cost and quality alone cannot retain competitiveness of an apparel industry. Instead, apparel manufacturers’ adaptability in terms of providing products in a quick, responsive and flexible manner in relation to order-fulfilment and inventory management became a new comparative advantage (Abernathy et al. 2006). To achieve such capabilities, an apparel manufacturer must have sophisticated and costly IT and adopt modern management patterns, such as lean manufacturing (frequent shipments by suppliers to fill ongoing replenishment orders from retailers) or agile manufacturing (the ability to manage short turnaround times for time-sensitive apparel items) (Gereffi and Memedovic 2003, Qi et al. 2009).

Research and industry reports universally point out that the Chinese apparel industry is more capable of being adaptive to buyers’ requirements. In India, the domination of small-scale firms has resulted in low levels of IT adoption among apparel manufacturers (Chandra 2005). In addition, the government’s policies up to the mid-1980s were to preserve small firms and depress foreign trade and investment, which, in turn, discouraged effective and efficient manufacturing and inventory management (Verma 2002, Tewari 2008). As revealed by an industry survey, in India, apparel manufacturers’ managerial efforts were less focused on improving manufacturing flexibility in comparison to other efforts such as customer service and quality improvement (Sahay and Mohan 2003).

In comparison to India, apparel firms in China have benefited from greater experience (longer history and more firms) in dealing with international buyers, who have invested in the firms’ technology and introduced innovative managerial practices as part of implementation of their world-class supply chain.
In addition, since the late 1990s, the Chinese government has increasingly put greater emphasis on technology and managerial capability as the future direction for the industry’s international competitiveness (Fan et al. 2004). According to Qi et al. (2009), the majority of surveyed Chinese textile and apparel manufacturers placed high importance on production management such as focusing on lean or agile manufacturing. In another investigation of the Chinese apparel industry’s competitiveness, Smook (2005) found that 65% of surveyed foreign firms evaluated Chinese apparel firms’ performance in inventory management and information flow as above average.

However, despite the Indian apparel industry’s low levels of strategic initiatives and actual implementation of lean or agile manufacturing models, domination of small-scale operations has resulted in high flexibility in running small batches of complex orders (Verma 2002). Over time, many Indian apparel exporters became highly proficient at handling complex designs in small-runs, multiple product lines and fast-changing orders of variable styles and specifications (Tewari 2005). For example, apparel companies in India can handle a wide range of orders, even as low as 500 pieces, which would not be cost-effective for a typical Chinese apparel company that works on a larger scale and is more capable of mass production (Gereffi et al. 2005).

**Full-package production**

Another strategy for apparel manufacturing firms to gain competitiveness is through providing a full-package production. By offering a full range of operations from design and product development to cutting to assembly and then exporting of garments to overseas customers, more value-added could be generated for involved apparel firms (Lewis and Dickson 2003). Industry experts and researchers agree that formation of full-package production in India has been hindered by the government’s restrictions on firm size and the associated capital and technology restraints (Fan et al. 2004). For example, Verma (2002) stated that in comparison to its competitors, the structure of the Indian apparel industry is extremely fragmented. Even though some movement towards full-package production has been observed in the country, the progress has been constrained to a limited number of larger firms (Tewari 2005).

In contrast, consolidation in the Chinese apparel manufacturing sector since the late 1990s has been one of the key government initiatives for helping the industry to remain competitive, with small or inapt firms either disappearing or merging into a more comprehensive operation scale (Li and Fung 2007, Bowerman and Bachmann 2008). As a result, an increasing number of Chinese apparel firms are capable of coordinating multiple activities and adept at full-package production (Fan et al. 2004). As noted in an International Trade Center (ITC) (2005) report, the Chinese apparel manufacturing has gained international competitiveness by catering to a wide range of customer requirements. Nowadays, it is the superior service that attracts customers to China instead of low-cost production as it is the case in many other Asian countries (ITC 2005).

It is important to mention the contribution of supply chain cities in the development of full-package production in the Chinese apparel industry. Supply chain cities are locations that house: (1) various apparel production activities from design to assembly and (2) other supporting facilities such as logistics and warehouses, sales and design offices, banking and amenities (Lu and Wang 2010). By doing business in supply chain cities, customers can find everything needed to manufacture a garment in a single location, i.e. with factories located near textile mills and suppliers of various components (Kusterbeck 2005). With the first supply chain city established in Dongguan in 2004, an increasing number of textile and clothing related supply chain cities have emerged in the coastal area of China (Lu and Wang 2010, Luenthai 2011), which effectively expanded the full-package production scope in the Chinese apparel industry.

**Logistics and transportation services**

The efficiency of a country’s logistics and transportation services can either facilitate or hinder the country’s comparative advantage in a global industry. The more costly and time-consuming it is to export and import, the more difficult it is for firms to be competitive and reach international markets (World Bank 2009a). Transportation of goods from India to the European and US markets is long and expensive for various reasons, such as outdated and underdeveloped seaports and airports facilities, limited inland transportation infrastructure and excessive bureaucratic procedures (World Bank 2009a). The Indian apparel industry has as many as 15 intermediaries between the raw material suppliers and international buyers, compared to the industry’s average of 7–9 intermediaries (Verma 2002). This increases lead time and product cost, resulting in about 40% of apparel cost added at the logistic stage (Verma 2002).

In contrast, China has made great progress in improving logistic services and transportation infrastructure (Pfohl and Shen 2008). As a result, the country has the leading infrastructure among its Asian competitors (World Bank 2009b). For example,
China’s international logistic service (based on a combined evaluation of export time, export cost and custom documents) was ranked as the sixth in Asia and 44th in the world, whereas India was ranked the 94th (World Bank 2009b). In particular, average export cost is significantly lower in China than India ($500 vs. $974 per container).

Domestic marketing

The last component in Gereffi and Memedovic’s (2003) apparel GVC is related to apparel firms’ marketing practices, which require firms to acquire expertise in brand development and retail distribution in order to sell their own branded merchandise in international and domestic markets. In comparison to other components in the apparel GVC, marketing activities endow the highest value-added and market control, making this last stage of the GVC essential for apparel firms (OECD 2007). Corresponding to the preceding discussion of GVC governance patterns, the apparel GVC has the buyer-driven governance, where the lead firms are marketers and retailer, typically from developed countries (Gereffi 2002). For example, Tewari (2005) commented that ‘global trade in the apparel industry is increasingly organised by powerful buyers, mainly large retailers and branded merchandisers (such as Wal-Mart, Gap and Nike), who coordinate the design, production and distribution of apparel within highly mobile, globally dispersed clothing value chains’ (p. 5). Accordingly, given their predominate manufacturing focus, both the Chinese and Indian apparel industries are relatively weak in the marketing component compared to other components in the apparel GVC. Nevertheless, the Chinese and Indian apparel industries still present different strengths in branding and retailing for the respective domestic markets, as illustrated next.

With the exception of a few apparel manufacturers who have taken strong steps to improve their strength in brand development, most Chinese firms predominate focus on manufacturing (Kaibin 2008). As concluded by Fan (2006), ‘modern Chinese companies are large and successful as manufacturers, but uncertain about the relative merits of branding and global marketing versus continuation as manufacturers for established global brands’ (p. 1). This has directly impeded Chinese apparel firms’ competitiveness in design and product development (Kaibin 2008). Statistics reveal that Chinese apparel enterprises invest only 0.16% of their sales revenue in design and product development in comparison with 5–10% of their European counterparts (Li and Fung 2006). According to another survey conducted by the China Brand Research Institute, less than 5% of Chinese apparel companies actually manufacture products under their own names (PanAsianBiz 2006). Inadequate branding capabilities have directly attributed to Chinese apparel firms’ unsatisfactory performance in retail distribution in both international and domestic markets (Li and Fung 2006). Today, hardly any Chinese apparel retailers have successfully introduced their own brands in international markets. Even in the domestic apparel market, Chinese brands are struggling to compete with their international counterparts, especially in the medium to high market ends (Li and Fung 2006). This is because of Chinese apparel companies’ limited exposure to modern retailing practices and incompetence in advanced retail management (Fan 2006).

In comparison to China, Indian apparel firms perform better in marketing with respect to brand development and retail distribution (Palpacuer et al. 2006). Indian apparel firms have traditionally focused on design, including ethnic design associated with embellishment, embroidery and beading. This highly specialised design competence helped to establish successful domestic brands (Doshi 2006). In addition, through their frequent cooperation with western designers, Indian apparel designers’ skills are constantly improving as they becoming more experienced in designing styles that parallel those in international markets (Tewari 2005, Fiber2Fashion 2005a). On the other hand, the expansion of foreign apparel brands into the Indian retail market is more difficult than in China, partly because of Indian consumers’ preference for buying apparel goods from small neighbourhood shops and a strong taste for Indian ethnic designs (Doshi 2006, Kazmin 2010). Consequently, competing pressure from foreign brands in Indian apparel retail market is significantly less than in China, which leaves more room for domestic brands to grow (Cygnus 2004). For instance, virtually all top Indian apparel exporters have a substantial presence of their own brands in the domestic market (Tewari 2005). Whereas establishing strong domestic brands remains a priority for many Chinese apparel firms, Indian apparel firms appear to be ready to develop and distribute brands overseas (Cygnus 2004, Doshi 2006). For example, in 2009, the Indian apparel firm Techno Lifestyle GmbH has taken over 28 out of 43 stores of the large chain Wehmeier in Germany, which signifies Indian apparel retailers’ ambitions to tap into the global market of mid-to-low priced apparel (Mehta 2009).

Discussion and conclusions

This study investigated the comparative advantages of the Indian and Chinese apparel industries by analysing their performance in each component of the apparel
GVC (textile materials supply, manufacturing, logistics and marketing). Each component has different implications for a national apparel industry’s comparative advantage (OECD 2007). Access to abundant, high-quality and low-cost textiles is considered to be one of the most important determinants of apparel suppliers' competitiveness. While low wages can still give manufacturers a competitive edge, other factors such as manufacturing quality and flexibility as well as full-package production play an increasingly important role in forming a comparative advantage in the apparel industry. Efficient and reliable infrastructure and logistic services help avoid long transit times and make remote locations more competitive. The marketing component generates the highest profit margin and exerts the greatest market power in comparison to the other GVC components. The bold font indicates more competitive GVC activities for the two industries.

Comparative advantage between the Chinese and Indian apparel industry

The findings demonstrate that the Indian and Chinese apparel industries present considerably different patterns in comparative advantages. The Chinese apparel industry has comparative advantages in: (1) textile material supply in terms of quality and diversity, particularly, in the MMF sector; (2) scale production; (3) full-package production and lean/agile manufacturing and (4) efficient and effective transportation and logistics services. The Indian apparel industry has comparative advantages in: (1) lower labour costs; (2) production differentiation and specialisation; (3) flexible manufacturing based on small-scale operations and (4) domestic brand development and retail distribution. With respect to disadvantages, the Indian

Table 4. Comparative analysis of the Chinese and Indian apparel industries’ GVC activities.

| GVC components       | India                                      | China                                      |
|----------------------|--------------------------------------------|--------------------------------------------|
| **Raw material supply** |                                            |                                            |
| Quantity             | #2 in the world                            | #1 in the world                            |
| Cost                 | Lower cost in most fibre/fabric categories | Slightly lower cost in man-made fibre/fabric categories |
| Quality and diversity| Limited MMF production                     | More competent in producing quality MMFs   |
|                      | Lower level of fabric production diversification (#31 in the world) | Higher level of fabric production diversification (#8 in the world) |
| **Manufacturing**    |                                            |                                            |
| Labour cost          | Lower labour cost ($0.51 per h)            | Higher labour cost ($0.68–1.08 per h)      |
|                      | Slower increase of labour cost             | Faster increase of labour cost             |
| Productivity         | Lower productivity                         | Higher productivity                        |
|                      |                                            | Advantageous in the economy of scale       |
| Workforce skills and | Higher capability in handling complex designs | Rapidly improving manufacturing quality     |
| manufacturing        | Slightly higher average export unit value  |                                            |
|                      | Highly specialised in hand woven, embroidery, other embellishments |                                            |
| quality              |                                            |                                            |
| Adaptability (flexible, lean, agile) | Lower managerial initiatives to increase adaptability | Higher managerial initiatives to increase adaptability |
|                      | Lower IT adoption and limited implementation of lean or agile manufacturing | Higher IT adoption and greater implementation of lean or agile manufacturing |
|                      | High flexibility (e.g. handling small-runs of multiple product lines) based on small scale operations | Higher degree of industrial consolidation |
|                      |                                            | Full-package production is more extensive  |
| Full-package production | Highly fragmented industry                  |                                            |
|                      | Early stages of formation of full-package production |                                            |
|                      |                                            |                                            |
| Transportation/logistic | Lengthy and costly                          |                                            |
|                      | Ranked #94 in the world’s international logistic service | Ranked #44 in the world’s international logistic service |
| **Marketing**        |                                            |                                            |
| Brand building       | Strong domestic brands                     | Weak domestic brands                       |
|                      | Strong design and product development skills | Less inept in design and product development |
|                      | Advantage related to ethnic and traditional design | Weak performance in the domestic retail market |
|                      | Strong performance in the domestic retail market | Low prospects for global retail expansion |
| Retail               | High prospects for global retail expansion  |                                            |
industry has lower capability in MMF supply, lacks in manufacturing adaptability, is inefficient and ineffective in logistic service and has achieved a very limited scope of full-package production. In addition to rising labour and production costs, the Chinese apparel industry is noticeably weaker in the marketing component, including domestic brand development and retail distribution.

Because the higher value-added a national industry generates in the apparel GVC, the greater the comparative advantage the country has (OECD 2007), it is essential to incorporate this perspective in the comparative analysis of the Chinese and Indian apparel industries (Table 5). As each industry has advantages in different value-added activities within the GVC, we posit that the two industries are highly comparable in terms of their capabilities in creating higher value-added. However, this conclusion could be different if other criteria were chosen in evaluating the comparative advantages of the Chinese and Indian apparel industries (e.g. export quantity). It is important for both industries to be involved in more higher value-added activities, which is often referred to as industrial upgrading (Gereffi and Memedovic 2003). Table 5 may serve as a guideline for developing upgrading strategies for each industry.

**Upgrading opportunities and future development**

**The Indian apparel industry**

The Indian apparel industry has a tremendous potential, considering its advantages in low-cost skilled labour and abundant resources. However, only a portion of this potential has been exploited due to inflexible government policies, which have prevented industry consolidation, infrastructure development and technology adoption. For the industry to fully utilise its capacity, addressing these issues is vital. Exploiting the industry’s comparative advantages in production specialisation and marketing is another route for upgrading, which would result in higher value-added production and greater market power. More specifically, the Indian apparel industry should consider the following upgrading strategies:

- Enhance competence in the MMF sector, in terms of the domestic fibre supply and apparel manufacturing.
- Improve manufacturing productivity through achieving higher economies of scale, adopting sophisticated machinery and advanced management strategies.
- Increase manufacturing adaptability, such as agile and/or lean manufacturing practices.
- Embrace full-package production through promoting industrial integration and consolidation.
- Capitalise on specialisation and competence in complex designs and intricate embellishments by developing niche markets.
- Exploit existing comparative advantage related to flexible production, e.g. attracting small-volume buyers.
- Improve logistics and transportation services.
- Expand production of own brands that can compete in international retail markets.

**The Chinese apparel industry**

Compared to the Indian apparel industry, the Chinese apparel industry is relatively advanced in terms of industrial integration and infrastructure establishment. However, China’s advantages in low-cost labour and production are vanishing, whereas such advantages are not yet fully exploited in India. At the same time, the Chinese apparel industry’s participation in the high end of the GVC is limited due to low-marketing and branding competency. Seeking alternatives to upgrading price-competitive production and focusing on high value-added activities should be a central strategy to upgrading the Chinese apparel industry. In particular, the industry should (1) enhance competencies in higher value-added activities and (2) shift to the

| GVC components                  | Practices/generations of higher value-added                                                                 | Achieved by |
|---------------------------------|-------------------------------------------------------------------------------------------------------------|-------------|
| Textile material supply         | Higher focus on MMF than natural fibres (e.g. cotton)                                                        | China       |
| Manufacturing                   | Full-package production (vs. mere assembly)                                                                  |            |
|                                 | Providing agile/lean manufacturing (vs. mere assembly)                                                       | China       |
|                                 | Production differentiation, small scale/flexible manufacturing and creating higher average unit value          | India       |
| Logistics and transportation    | Higher value-added generated by saving costs and shortening lead time                                          |             |
| Marketing                       | Brand development and retail expansion                                                                       | China       |
roles of foreign investors and agents/middlemen in the apparel GVC. The Chinese apparel industry should consider the following upgrading strategies.

- Focus manufacturing efforts on higher value-added products, such as manufacturing high-quality, MMF-based, innovative and high-tech products.
- Shift manufacturing sites to inland China, where labour-costs are lower.
- Transit to the role of a supply-chain coordinator (as seen in the past experience of Hong Kong’s apparel industry).
- Continue to improve technological and managerial practices to achieve highest international standards (e.g. in logistic, lean and agile manufacturing).
- Build domestic brands through developing design and product development capabilities.
- Develop competence in retail distribution.

**Implications for the global apparel industry**

**Shifts in global apparel sourcing**

The analysis of comparative advantages of the Chinese and Indian apparel industries pointed out potential trends in global apparel sourcing. Given the evidence that the recent production cost surge in the Chinese apparel industry has pushed many buyers to seek alternative options in apparel production (Fiber2Fashion 2005b), it is expected that sourcing of low-price apparel continues to decline in China. For example, it is logical to predict that countries such as Bangladesh, India, Vietnam, Cambodia, Indonesia and Pakistan, which used to closely compete with China in the low-price production sector, are likely to become increasingly important for sourcing low-price apparel (Gereffi and Frederick 2010). Second, China would become an important sourcing destination for buyers who are willing to pay a premium price in return for higher quality and superior service. China will attract these buyers based on its advantages in economies of scale, established infrastructure and capabilities in advanced manufacturing such as full-package and lean/aggregate production.

Considering the Indian apparel industry’s comparative advantage in production differentiation and flexibility, which can be further enhanced through the country’s industrial reforms, it will likely continue to be a popular sourcing site for buyers that require smaller volumes, products with original designs and unique embellishments, or seek to diversify their product range. In addition, if the industry will be able to implement and capitalise on consolidation and infrastructure improvement, an increasing number of volume buyers will be cooperating with Indian vendors.

**Contributions and future research**

This study was a first attempt to systematically investigate the world’s two leading apparel industries located in Asia – the Indian and Chinese apparel industries – by examining their comparative advantages in terms of industry performance. The analysis of the two industries using the GVC framework provided unique insights into the current condition of the two industries and identified major comparative advantages as well as directions for further upgrading. This methodological approach – applying GVC as a framework for understanding a national industry's comparative advantages – can be extended to study other industries and countries. The findings and recommendations of this study might help the Indian and Chinese governments to form the apparel industrial upgrading policies, as well as provide guidance to individual companies for moving up the value chain.

This study investigated the comparative advantages of the Indian and Chinese apparel industries from the perspective of the apparel GVC. There are other factors that may have an impact on apparel industry comparative advantages such as level of workforce education, trade regulations, political and economic situations, and cultural barriers (Jin and Moon 2006). Further research is needed to understand what impact these factors might have on comparative advantages of the Indian and Chinese apparel industries both for short and long terms. Another important research direction is to explore how the GVC framework can be expanded to include the missing factors and develop a comprehensive framework for examining comparative advantages of national industries.

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