

[Original Article]

Matching Sourcing Destination with Fashion Brands' Business Model: Comparative Advantages of Bangladesh and Vietnam Apparel Industries

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Abstract

This study investigated the comparative advantages of the Bangladeshi and Vietnamese apparel industries using Global Value Chain (GVC) framework. In this study, the GVC framework was expanded to include social and environmental sustainability issues. Secondary data, for the 2012 - 2013 period, were collected and analyzed for each component of the apparel GVC. The findings indicated that while both countries have unique comparative advantages, Vietnam clearly emerged as a leader on many GVC components. Bangladesh's comparative advantage lies in lower wages, producing high volume orders, and lean manufacturing. In spite of Vietnam's higher labor costs, it has comparative advantages in higher productivity, skilled and trained workers, manufacturing of intricate styles of high quality, agility and flexible manufacturing, more developed infrastructure and logistic services as well as greater social and environmental compliances. This study contributes towards insight into best sourcing fit for fashion brand business models. Based on the findings, fashion driven companies offering more complex styles at a faster rate will benefit from choosing Vietnam. In contrast, Bangladesh might be a better choice for high volume driven companies that offer basic apparel and better value for their consumers. From theoretical perspective, the research makes an important contribution by expanding the GVC framework.

Keywords: sourcing, Bangladesh, global value chain, Vietnam

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I. Introduction

In today's highly competitive retail landscape, fashion companies are striving to better their financial performance. To keep up with the escalating competition, fashion brands are constantly refining their global sourcing practices in an attempt to lower production costs and delivery time (Rollins, Porter, & Little, 2013). One of the solutions is to better match suppliers' resources and capabilities with the company's business model: value basic apparel vs. fast delivery of fashionable styles (Ganesana, George, Jap, Palmatier, & Weitz, 2009).

Even though China has been the major apparel producer since the early 2000's

(World Trade Organization [WTO], 2014) fashion brands have been increasingly using new locations for apparel assembly (Berg & Hedrich, 2014). Rising production costs and tightening environmental regulations in China as well as consumer demand for fast fashion at lower prices has become major motivations for firms to re-evaluate their sourcing strategies (Berg, Berlemann, & Hedrich, 2013). Finding new locations to produce fashion products requires a suitable match between customer needs and business operations with the capabilities of the sourcing location. "A poor match will limit the company's ability to respond to market changes and is likely to inhibit company growth" (Rollins et al., 2013, p. 141).

Bangladesh and Vietnam have been recognized as the fastest growing and most promising apparel producing nations (Beron, 2014; Salmon, 2013). Yet, limited information exists about the respective strengths and weaknesses of Bangladesh and Vietnam's apparel industries and their apparel industries will integrate with fashion companies' business models. The purpose of this study was to examine comparative advantages of the Bangladeshi and Vietnamese apparel industries to provide important information for fashion companies. A comprehensive investigation and understanding of the two industries can be helpful in making informed decisions when choosing locations for sourcing fashion production.

First, this paper presents the Global Value Chain (GVC) framework to conceptualize this research. Second, the research methodology employed is discussed. Third, the results of the analysis of Bangladeshi and Vietnamese apparel industry comparative advantages are presented. The paper concludes with implications and recommendations for fashion brands considering sourcing apparel production from these two countries.

II. Literature Review

1. Comparative Advantage

Comparative advantage refers to location-specific advantage and impacts where to source from. "It is based on the lower cost of a factor (labor, for example) in one country relative to another, favoring industries that use this factor intensively" (Kogut, 1985, p. 15). The comparative advantage theory, proposed by Ricardo in 1816, has been applied to evaluate industries such as agriculture and automobiles, in addition to the textile and apparel sectors (Ruffin, 2002). The GVC framework has been utilized to assess comparative advantages of industries in different countries (Lu & Karpova, 2011).

2. Global Value Chain (GVC)

For this study the GVC was employed to analyze the comparative advantages of the apparel industries in Vietnam and Bangladesh. Global value chains refer to global systems that are producer-driven or buyer-driven (Gereffi & Memedovic, 2003). Producer-driven chains are capital and technology intensive industries such as automobiles, and computers. The apparel industry is a buyer-driven value chain, characterized by its labor-intensive nature and presence of large retailers and brands that play a pivotal role in specifying product requirements for a specific market (Gereffi & Frederick, 2010). Global sourcing is a crucial function for buyer-driven value chains (Gereffi & Memedovic, 2003) and is motivated by the need to reduce operational costs and increasing business flexibility to respond quickly to changing markets (Shelton & Wachter, 2005).

In order to choose most effective location for fashion production, companies need to prioritize their "procurement requirements" and then make trade-offs among important factors such as cost of manufacturing, quality, capacity,

speed, and possible risk involved (Berg & Hedrich, 2014, p. 63). The GVC provides apparel firms with a tool to prioritize their procurement requirements and to evaluate the strengths and weaknesses of various manufacturing locations. The GVC covers the following components: material supply; manufacturing capabilities; established transportation networks and export channels; and marketing and retail networks (Gereffi & Memedovic, 2003). Because Bangladesh and Vietnam are primarily export-oriented apparel producers, the last GVC stage was not included in this study. Instead, an expansion of the GVC framework to include social and environmental sustainability components was proposed because many apparel firms place increasing importance on these factors when evaluating potential apparel suppliers.

2.1 Material supply

Access to materials (fiber, yarn, fabric) is essential to producing apparel (Rivoli, 2014). According to Brown and Zukerman (2012), waiting for materials contributes to the longest part of the product cycle and is detrimental in terms of hidden costs. In this study, Bangladesh and Vietnam's availability and access to a variety of materials were evaluated.

2.2 Manufacturing capabilities and capacity

In apparel industry, labor cost can account for up to two-thirds of the total production cost (Rivoli, 2014). A superior workforce is one that receives lower wages than other comparative countries, maintains steady yet increasing productivity, and has the necessary skills to complete the work. Quality and capacity have to be taken into consideration when assessing a country's manufacturing capabilities (Lu & Karpova, 2011). Flexibility in offering customers lean or agile manufacturing can result in a national industry's competitive advantage. Additionally, on the supply side, the performance and options offered such as full-package options versus CMT (cut, make, and trim) and adaptability (flexibility, lead time) will influence sourcing decisions (Gereffi & Memedovic, 2003).

2.3 Transportation networks and logistics services

It is important to consider "hard" dimension related to tangible infrastructure such as roads, ports, highways, and telecommunications, as well as "soft" dimension related to customs management, and other institutional aspects. In addition, electricity supply and communication infrastructure (internet and phone) are critical components in establishing efficient and effective supply chain in the highly fragmented apparel global industry. Final product cost and delivery time depend on these factors (Gereffi & Memedovic, 2003).

2.4 Social and environmental sustainability

More apparel companies are taking a proactive approach to ensure that suppliers comply with regulations on safety, human rights, and environmental protection (Berg et al., 2013). Leading fashion retailers agreed that corporate social responsibility now ranks as the "most important factor when it comes to sourcing before production quality, reliability, and flexibility" (Berg et al., 2013, p. 6). Fashion companies contemplating moving production to countries with lower wages now also consider social and environmental risks. Social sustainability factors comprise "access to basic necessities, vulnerability to economic exclusion [and] social cohesion" (Corrogan, Crotti, Hanouz, & Serin,

2014, p.65); and environmental sustainability factors include “environmental policy, use of renewable resources and degradation of the environment” (Corrigan et al., 2014, p.66).

3. Overview of Bangladeshi and Vietnamese Apparel Industries

In Table 1, the indicators related to the apparel industry performance in Bangladesh and Vietnam are summarized and compared with China, the world's leader in apparel manufacturing. Apparel industry contributes 10% to the two countries' gross domestic product (GDP), which is twice more than in China. Vietnam's industry has higher annual growth rate of 21% (14% for Bangladesh). Vietnam also has twice greater growth in the world's share exports. Vietnam and Bangladesh have a comparable number of factories, 4,500 and 6,000, respectively.

Table 1. Performance of Bangladeshi, Vietnamese and Chinese apparel industries, 2013

Indicators	China	Bangladesh	Vietnam
World ranking in apparel exports	1 st	3 rd	4 th
Apparel export (in USD millions)	96,810	13,115	8,454
Contribution to the national GDP (%)	5	10	10.5
Apparel export share in the total exports (%)	4.4	80	6.1
Apparel exports share in the world's exports (%)	43.35	5.87	3.79
Growth of apparel export in value (% p.a.)	16	14	21
Growth of share in world exports (% p.a.)	7	5	12
Number of apparel manufacturing companies	>100,000	6,000	4,500
Population	1.4 bil	158.5 mil	90.6 mil

Sources: International Trade Centre, 2015; Schwab & Sala-i-Martin, 2014; WTO, 2014

3.1 Bangladeshi apparel industry

Bangladesh was traditionally known for its artisans who worked in small groups to produce textiles and apparel. In the early 1980's, the Bangladeshi government privatized textile industry and apparel industry (Islam, Khan & Islam, 2013). In the 2000s, apparel exports have grown at an average annual rate of 8% (Berg et al, 2013). Its share of world clothing exports has grown from 2.6% in 2000 to 5.1% in 2013 (WTO, 2014).

3.2 Vietnamese apparel industry

North and South Vietnam united in 1975, when the Vietnamese government initiated an economic policy to encourage privatization and growth of local businesses as well as promoting relations with other countries. Vietnam exports apparel to over 180 countries and territories (WTO, 2014). The country has benefited from the ASEAN free trade agreements. If passed, the Trans-Pacific Partnership (TPP) agreement will allow duty free Vietnamese apparel exports to the US, Japan, and Australia.

III. Methodology

To analyze comparative advantages of Bangladesh and Vietnam's apparel industries based on the GVC framework, secondary data were collected from world's and governmental organizations for the 2012 - 2013 period. Export and import data were collected from the World Trade Organisation [WTO] (2014) and the United States Department of Agriculture [USDA] (2013). Labor costs, manufacturing capabilities, skills and added services data were collected from the International Labour Organization (2014) and International Trade Centre (2015).

The World Bank's logistics performance index (LPI) was used to examine logistical services. Indicators from the Global Competitiveness Index (GCI) compiled by the World Economic Forum (Schwab & Sala-i-Martin, 2014) was used to analyse productivity, education, and on the job training of workers as well as compliance with social and environmental regulations. Specific indicators used from the GCI were: productivity and pay ratio, education level of workers, on-the-job training, employment, workers safety, basic human rights and compliance with environmental regulations. Other organization and industry reports were consulted, such as Organization of Economic Co-operation and Development [OECD] (2015) and CBI (2013/2015) to obtain data about working conditions, lead-times, and industrial integrations, etc. The GVC framework was used to structure descriptive analyses of all the data to examine and compare comparative advantages of the Bangladeshi and Vietnamese apparel industries.

IV. Results

1. Raw Materials and Textile Supply

For garment production, materials make up 50-70% of the total cost and determine product quality (Van Tot, 2014). Cost, quality, and availability of materials (fiber, yarns, fabrics, threads, findings, and packaging) are critical for timely and efficient apparel production (Berg et al., 2013; Rivoli, 2014).

1.1 Domestic production of materials

Table 2 presents Bangladesh and Vietnam's fiber, yarn, and fabric productions. With a total output of 129,000 bales, Bangladesh produces six times more cotton than Vietnam (21,000 bales). Bangladesh's yarn production also substantially exceeded that of Vietnam. Bangladesh has almost four times as many spinning mills as Vietnam and almost twice as much spindle capacity (Dao & Huong, 2013; Hussain, 2013). At 3.95 billion meters, Bangladesh also exceeds Vietnam in fabric production (Table 2). The two countries have similar capacity for dyeing and finishing fabric.

Table 2. Bangladesh and Vietnam's fiber, yarn, and fabric production, 2012/2013

Indicators	Bangladesh	Vietnam
Fiber Production		
Cotton (bales)	129,000	21,000
Yarn production		
Spinning mills	394	100
Spindle capacity (kg)	9,600,000	5,100,000
Rotor/Open-End capacity (kg)	230,000	103,348
Production of yarn from cotton and polyester/rayon (tons)	688,000	680,000 (primarily cotton yarn production)
Fabric production		
Fabric production	3.95 (billion meters)	1.0 (billion meters)
Dyeing and finishing	240 mills	240 mills
Knitted and woven fabrics	780 weaving mills	1,000 knit and woven mills Knitted = 80,000 tons Woven = 700 million meters
	Handwoven = 650 million meters	

Sources: USDA (2013)

Bangladesh's strength lies in woven fabrics, particularly, in hand-woven textiles (Hussain, 2013). However, the country still faces an escalating demand for textiles and a pressing need to upgrade capacities in spinning, weaving, knitting, dyeing, and integration of up-to-date technology to guarantee quality products at competitive prices (Islam et al., 2013).

Vietnam has been developing its knitting sector significantly (Islam et al., 2013). Yet, in 2013, only 20-25% of the woven fabric demand for apparel was produced domestically (Van Tot, 2014). Vietnamese fiber and yarn diversity and quality are not strong enough to meet the growing apparel industry's needs.

1.2 Import of fiber, yarn, and fabric

Table 3 presents a summary of textile imports by the two countries. In 2013, the total world's cotton import was 8.4 million tons (Van Tot, 2014). Of the total, Bangladesh imported 0.7 million tons and Vietnam imported 0.4 million tons of cotton. This is despite the fact that Bangladesh grows significantly more cotton than Vietnam (Tables 2). To support the fast growing apparel production, cotton use in the country has grown aggressively by over 1,000% in the 2010s (Emergingtextiles.com, 2015). Yet, Vietnam imports 70% more yarn and twice more fabric than Bangladesh (Table 3).

Table 3. Bangladesh and Vietnam's material imports, 2012/2013

Indicators	Bangladesh	Vietnam
Cotton as input material (million tons)	0.7	0.4
Yarn (thousand tons)	280.0	380.3
Fabric (billion meters)	2.4	6.0

Source: USDA (2013)

2. Apparel Manufacturing Capabilities and Capacity

Bangladesh has more apparel factories (6,000) than Vietnam (4,500) (Table 1). However, the size and productivity must be taken into consideration. Major indicators for apparel manufacturing capabilities in Bangladesh and Vietnam are presented in Table 4.

Table 4. Bangladesh and Vietnam's apparel manufacturing capabilities

Indicators	Bangladesh	Vietnam
Labor costs (per month)	~\$50	~\$100-\$150
Productivity	Lower productivity (103 rd)	Higher productivity (23rd)
Workforce skills	98 rank (out of 144): Low level of skills and training	64 rank (out of 144) Skilled and trained workers (64th)
Quality	125 th rank (out of 144) Inconsistent & lower quality	96th rank (out of 144) Consistent and higher quality
Adaptability (flexible, lean, agile)	Strength – Lean manufacturing	Strength – Agile manufacturing
Type of production	Mostly CMT-based	Mostly CMT-based Early stages of value-added services / full-package production

Sources: International Labour Organization, 2014; Schwab & Sala-i-Martin, 2014

2.1 Workforce skills, productivity, and cost

In 2014, workers' minimum monthly wages in Bangladesh's apparel industry was a little over \$50. In the same year, Vietnam's monthly wages ranged from just under \$100 to almost \$150. The Global Competitiveness Index (GCI) evaluates the relationship between productivity and wages in a country's overall labor market (Schwab & Sala-i-Martin, 2014). A score of 1 means that wages has no relationship to productivity, and a score of 7 means that wages have a strong association with productivity. Bangladesh is ranked 103rd, with a score of 3.5 indicating that wages are somewhat related to worker productivity. Vietnam is ranked 23rd and has a score of 4.6 indicating a stronger relationship between wages and worker productivity. This indicates that Vietnam's productivity is superior over Bangladesh. The GCI measures workforce skills with education and job training indicators. Bangladesh is ranked 98th with a score of 4.5 in the primary education category, whereas Vietnam has a higher score of 5.3, and is ranked 64th out of 144 countries (Schwab & Sala-i-Martin, 2014).

2.2 Quality, adaptability, and technology

Although Bangladesh is efficient at managing high-volume orders (Berg & Hedrich, 2014), product quality is lower and inconsistent – ranked 125th out of 144 countries (Table 4). Vietnam's apparel industry is capable of producing higher quality products: the country ranked 96th. Bangladesh demonstrates strengths in lean production, whereas Vietnam – in agile manufacturing (Berg et al., 2011; Vietnam trade promotion agency [Vietrade], 2012). In

Bangladesh, the average lead time is between 90 and 120 days; very few producers have the ability to push times below 30 days.

Bangladesh's apparel industry is mostly CMT-based (Berg et al., 2011; Monsur & Yoshi, 2012). Similarly, Vietnam's garment manufacturing has been primarily CMT-based, but newer firms have been steadily increasing their value-added service by providing full-package options (Van Tot, 2014). To summarize, Vietnam's apparel industry has a definite comparative advantages in productivity, quality, skilled workforce, and agile production (Table 4). However, in the labor-intensive garment sector, Bangladesh's low-cost workforce can still compensate for the lower productivity rates and can handle high-volume orders.

3. Infrastructure and Logistics Services

To support apparel manufacturing and trade, Vietnam has a superior transport infrastructure (roads, ports, airports, railroads) in comparison with Bangladesh (ranked 76 vs. 115; Table 5). The former is also almost twice ahead in terms of internet communication and technology use (scores 2.3 vs. 1.2; ranked 86 vs. 131) and electricity and phone infrastructure (scores 4.0 vs. 2.1; ranked 81 vs. 127). The data indicate faster and easier communication with Vietnamese factories, more reliable power supply, and faster deliveries.

Table 5. Bangladesh and Vietnam's infrastructure and logistics performance, 2014

Indicators	Bangladesh		Vietnam	
	Score	Ranking	Score	Ranking
Overall LPI	2.56	108	3.15	48
Customs	2.09	138	2.81	61
Infrastructure	2.11	138	3.11	44
International shipments	2.82	80	3.22	42
Logistics competence	2.64	93	3.09	49
Tracking and tracing	2.45	122	3.19	48
Timeliness	3.18	75	3.49	56
	Score	Ranking	Score	Ranking
Transport infrastructure	2.70	115	3.50	76
Internet and communication technology use	1.20	131	2.30	86
Electricity and phone infrastructure	2.10	127	4.00	81

Sources: Schwab & Sala-i-Martin, 2014; World Bank, 2014

The logistics performance index (LPI) is calculated based on six dimensions: 1) efficiency of clearance process by customs; 2) quality of trade and transport related infrastructure; 3) ease of arranging competitively priced shipments; 4) competence and quality of logistics services; 5) ability to track and trace consignments; and 6) timeliness of shipments in reaching destination within the scheduled or expected delivery time. Considering transportation and logistics services, Vietnam by far surpasses Bangladesh: all rankings are almost better (Table 5). Bangladesh is at a major disadvantage in terms of its infrastructure, logistics, and stable energy supply.

4. Social and Environmental Sustainability

Social indicators analyzed were workers safety and basic human rights. Environmental indicators included: renewable resources and eco-friendly practices. The factors for both countries are reported in Table 6.

Table 6. Bangladesh and Vietnam's social and environmental sustainability indicators

Indicators	Bangladesh	Vietnam
Human rights	Massive violations	Isolated occurrence of violations
Safety	Poor safety	Acceptable safety
Environmental sustainability	3.35 (lower compliance)	3.67 (higher compliance)

Source: Better Work, n.d.; Schwab & Sala-i-Martin, 2014; Vietrade, 2012

4.1 Social sustainability

Bangladesh's apparel industry employs about 4 million workers (Bangladesh Garment Manufacturers and Exporters Association [BGMEA], 2015), and in Vietnam about 2.2 million people are employed in the apparel industry (Vietrade, 2012). Bangladeshi apparel industry has suffered from numerous workplace tragedies that have damaged its global reputation, such as worst in the history fires and building collapses. In addition to poor workers safety, human right violations, low wages, and insufficient worker benefits have resulted into violent protests that forces factories to shut their operation. Vietnam, overall, has better safety regulations and compliance. Workers do have access to trade unions that play a supporting role in negotiations of pay, benefits and workers' rights (Cox, 2015).

4.2 Environmental sustainability

The GCI measures countries compliance with environmental regulations such as use of renewable resources and environmental policy (Schwab & Sala-i-Martin, 2014). A score of 1 indicates no compliance, and a score of 7 means that there is high compliance. Bangladesh has an environmental sustainability score of 3.35, whereas Vietnam's value is 3.67 indicating that Vietnam has stricter environmental regulations.

V. Conclusions and Implications

This research investigated the comparative advantages of the Bangladesh and Vietnam's apparel industries based on the GVC framework by comparing the two countries in terms of material supply, apparel manufacturing, transportation and logistics, and social and environmental sustainability. In this study, for the first time, the authors proposed the social and environmental sustainability indicators to expand the GVC framework. The updated GVC framework better reflects the changing priorities in the global apparel industry when buyers evaluate sourcing locations.

The research findings indicate that while the two countries have different strengths and weaknesses, Vietnam clearly emerged as a leader on most of the GVC components. A summary of comparative advantages of Bangladesh and Vietnam is presented in Table 7. The bolded segments highlight the comparative advantages of each country.

Table 7. Comparison of the Bangladeshi and Vietnamese apparel industries' GVC activities

GVC components	Bangladesh	Vietnam
Raw material supply		
Import priorities	Import more cotton fiber	Import more yarn and fabric
Quality and diversity of domestic textiles	Higher volumes of cotton fiber, yarn, and fabric production	Specializes in knit fabrics
Apparel manufacturing		
Labor cost	Very low labor cost (\$50/month)	Higher labor cost (\$100-\$150/month)
Number of apparel factories	6,000	4,500
Productivity	Low (103)	High (23)
Workforce skills	Low workers' skills and training	Skilled and trained workers
Manufacturing quality	Inconsistent and lower product quality	High quality products
Adaptability	Lean manufacturing	Agile manufacturing
Full-package production	Mostly CMT-based	Early stage of providing full-package production
Transportation/logistics		
Infrastructure	Poor (138)	Acceptable (44)
Energy supply	Energy supply at risk (127)	Reliable energy supply (81)
Internet and technology use	Low (131)	Acceptable (86)
Custom services	Poor (138)	Average (61)
Shipment timeliness	Low (80)	Acceptable (42)
Social and environmental sustainability		
Social sustainability	Lower (3.65 out of 7)	Higher (4.11 out of 7)
Safety	High-profile problems of building and fire safety	Acceptable workers' safety
Environmental sustainability	Lower compliance (3.35)	Higher compliance (3.67)

Bangladesh's major comparative advantage lies in lower wages, ability to produce high volume orders, and lean manufacturing. The Bangladeshi apparel industry benefits from domestic cotton production and manufacturing yarn and fabric (mostly cotton). At the same time, domestic supply of raw materials is not sufficient to support the fast growing apparel industry. The country is dependent on importing high volumes of cotton and fabric. Low workers' skills and training inhibit producing quality apparel. Bangladesh is clearly behind on infrastructure, communication, and logistics services, which substantially increase lead time and costs of doing business in the country.

Even though Vietnam's labor cost is two-three times higher than in Bangladesh, it is compensated by higher productivity of skilled and better trained workers. As a result of proficient workforce, Vietnamese apparel industry's comparative advantage lies in its ability to produce intricate styles, higher quality apparel as well as agile and flexible manufacturing. The country has significantly more developed infrastructure, communication, and logistics services, resulting in shorter lead times and a more conducive business environment. On the downside, Vietnam has insufficient domestic raw material supply and primarily relies on textile imports. Vietnam's flexible and agile manufacturing practices are suited for companies with a just-in-time business model with lower inventory and

reduced time to market (Azmeah & Nadvi, 2014). Another important comparative advantage is a greater social and environmental compliance in Vietnam's apparel industry, in comparison with Bangladesh. In addition, Vietnam is ahead of Bangladesh in offering full-package apparel manufacturing. This also contributes to the higher quality and shorter lead times in Vietnamese factories.

In conclusion, choosing between Bangladesh and Vietnam when sourcing apparel assembly will depend on the company's business model and the type of product they want to manufacture. For fashion driven companies that need higher quality, faster delivery, greater overall efficiency in producing more complex styles, Vietnam might be a better choice. In contrast, Bangladesh might be a better choice for high volume driven companies that offer basic apparel and better value for their consumers. The findings demonstrate that Bangladesh and Vietnam are filling unique niches in the global apparel industry.

VI. Limitations of the Study and Recommendations for Future Studies

This study focused on the components of the GVC in the two fast growing apparel producing and exporting countries, Bangladesh and Vietnam. Future studies could focus on analyzing the stages of the industry life-cycle, ownership, and activities of apparel firms. Other emerging countries such as Cambodia, Myanmar, or some Sub-Saharan African countries could also be included in future analyses to form a holistic picture of future centers for apparel manufacturing.

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