Impact of Supply Chain Management (SCM) in Bangladesh Textile-Clothing Industry: Comprehending the Role of Sourcing

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Abstracts
The research's major objective is to look at the supply chain management of sourcing in Bangladesh's textile and garment sectors. The demand and supply sides of Bangladesh's textile-clothing sector have been used as a backdrop for future study. Demand forecasting, product design and development, order management with distribution, and bilateral relationships have all been explored on the demand side, while supply side components such as raw materials procurement, cutting-making-trimming (CMT), and delivery have all been discovered. Fiber, yarn, fabric, dyeing, printing, finishing, and accessories are presented as backward links in this study. Forward links include transportation and communication, public services, and port services, among other things. In reality, Bangladesh is doing quite well in terms of contract-based apparel supply, but the demand side has to be increased as well. To assist the demand side move from assembly to whole package manufacturing, company owners and government must devote greater attention.

Key words: Textile-Clothing Industry, Demand-Supply Chain, Input-Output Analysis, Linkages.

1. Introduction

The phrase "supply chain management" has been a popular buzzword in recent years, having been initially used by consultants in the late 1980s and subsequently studied by academics in the 1990s. Supply chain management may be characterized as an integrated two-way communication system that connects all supply interacting firms in order to manage high-quality inventory in the most effective and efficient way possible (Raju and Phung, 2019b). The supply chain management represents the actions and values that are responsible for the continuous improvement of an organization's overall supply system's design, development, and management processes, with the goal of increasing profitability and ensuring its survival, as well as the profitability and survival of its customers and suppliers. The supply system of a company encompasses all internal operations as well as external suppliers engaged in identifying and fulfilling material, equipment, and service demands in an efficient manner. Supply chain management is built on a foundation of supply management, and it is the key to its success (Nengkoda, 2021).

Meanwhile, we have integrated supply chain management in a larger scope in our study to execute an order more effectively and efficiently. It is critical for a merchandiser to understand supply chain management in order to control the merchandising system. He or she must have a thorough understanding of the entire supply chain management in order to ensure smooth handling of the merchandising movement and the success of the merchandising plan (Raju and Phung, 2020a). This study is centered on the interaction between supply chain management and merchandising departments, which may give

excellent feedback for the garment sectors, including sourcing patterns and strategies in Bangladesh's textile and clothing industries (Poonkuzhali and Vinodhkumar, 2019).

A supply chain is made up of all parties engaged in completing a customer's request, whether directly or indirectly. Not only manufacturers and suppliers are included in the supply chain, but also transporters, warehouses, retailers, and even the customers themselves. The flow of items and information connects each level of a supply chain. These flows are often bidirectional and may be regulated by one of the phases or an intermediate (Polas et al., 2020). Here, we can see how a raw materials supplier supplies an industrial product to a manufacturer, who then sells it to a distributor, who then sells it to a retailer in small lots, and the ultimate consumer receives the product from the store. The following are the steps of the supply chain: (a) raw material supplier (b) manufacturer (c) wholesaler/distributor (d) retailer/customer.

1.2 Background of the Research

Apparel Outsourcing, Labor Costs, Tariffs, Product Quality, Lead Time, and Currency Exchange Rate are just a few of the main issues that will be discussed in the research study.

(a) The Apparel Outsourcing

The ultimate goal of garment outsourcing is to achieve low-cost operations while also meeting the requirement for business flexibility, which is required to meet the market demand for low-cost quick fashion. The Generalized System of Preferences Act (GSP), adopted by the United States Congress in 1974, was a regulatory mechanism enabling duty-free textile and clothing imports from developing countries such as China and Bangladesh (Saheed, 2019).

(b) The Labor Cost

The pay given to an additional unit of work, as well as any other compensations provided to a laborer by an employer, are included in labor expenses. The practice of shifting sourcing destinations for low-cost items, known as location shift, has become a typical occurrence in the textile and clothing sector (Raju, 2018). Wages are a substantial portion of the manufacturing cost in the garment sector since it is very labor intensive. In this scenario, the low labor expenses have a significant impact on cost reduction (Cockshaw, 2021).

(c) Tariffs

Tariffs are import levies placed on imported commodities by any government. In some nations, tariffs play a crucial role in garment manufacturing and investment. Other trade agreements, such as the North American Free Trade Agreement (NAFTA), the African Growth and Opportunity Act (AGOA), the Trans Pacific Partnership (TPP), the Multi Fiber

Agreement (MFA), and the Agreement on Textile and Clothing (ATC), affect garment import duties (Lebedeva, 2021)

(d) Quality of the Product

Quality is important to today's customers. They seek high-quality goods at reasonable rates, yet some customers are prepared to pay more for specific branded things because they believe that more quality comes at a higher price. Furthermore, a product's quality is insufficient. Customer happiness is also influenced by the level of service provided. Consumers are increasingly interested about the origins of items, since they perceive nation of origin to be a proxy for quality. For all imported items, a country-of-origin label is required. 2021 (Schousboe and Wejse).

(e) Lead Time

The period between placing an order and getting the products in house is referred to as lead time. Any kind of supply chain management relies heavily on lead time. The delay between placing an order and getting actual items is known as lead time in a buyer-driven commodities firm (Haenlein and Kaplan, 2020). The time it takes to create a product is another driving element in global sourcing. One of the anticipated procedures in the international garment trade to satisfy the need for rapid fashion is lead time reduction (Halliday Sandra, 2017).

(f) The Currency Exchange Rate

The currency exchange rate is the price of one country's currency in relation to another country's currency, and it fluctuates on an almost daily basis. Significant fluctuations in currency exchange rates effect both consumers and foreign enterprises. The influence of exchange rates on international commerce factors such as import prices, consumer pricing, and export import volume is the most significant (TURCHYN, 2021).

1.3 Argument in Favor of Supply Chain Management in the Textile-Clothing Industries of Bangladesh

The necessity for conversion to a new supply chain management paradigm was prompted by practices seen in conventional supply chain management (SCM). Long supply cycle times, large batch sizes, capacity based on annual volumes, volume-driven technology, and numerous suppliers for the same parts on short-term base contracts were all part of the traditional supply chain and manufacturing processes, which were designed with long supply cycle times, large batch sizes, capacity based on annual volumes, volume-driven technology, and numerous suppliers for the same parts on short-term base contracts (Schousboe and Wejse, 2021).

1.4 Different Stages of Supply Chain Management in the Textile-Clothing Sector

All four stages of supply management need a variety of viewpoints and inputs, which are best achieved via a cross-functional approach. These are the four stages of supply management:

(a) Generation of Requirements: The formation of requirements is a crucial activity that leads to the selection of the best products and services to buy, as well as the creation of specifications and statements of work to describe these needs (Aigrain, 2021).

(b) Sourcing: The goal of sourcing is to find and choose the ideal supplier who can match the firm's demands in terms of cost, quality, technology, timeliness, reliability, and service. A sourcing activity is the formation of supplier relationships (Pope, 2021).

(c) Pricing: The goal of pricing is to create rates that reward the supplier properly for its efforts while also resulting in the lowest total cost of ownership for the client company. While talks take place throughout the supply management process, they usually play the most important role during the price phase (Ziari et al., 2022).

(d) Post-Award Activities: This critical task guarantees that the company gets what it ordered on time, at the price and in the quality indicated. Supplier development, technical help, troubleshooting, and contract administration, as well as the relationships that follow, are all part of the post-award activities (Cotula, 2021).

1.5 Problem Statement

Bangladesh is reliant on offshore suppliers with substantial and dependable raw material production capability due to a lack of indigenous raw material production capacity. Low import costs and high local raw material costs both encourage this country to rely on certain components from other nations to fulfill domestic demand. As a result, it is vital to assess the advantages that a certain site may provide (Poh Phung, Valliappan Raju and Haji Zanial, 2018).

Bangladesh might suffer a substantial financial loss in this industry if no evaluation is made, or if the assessment is made incorrectly. It is well acknowledged that apparel retailers choose suppliers that can provide items at the lowest possible cost and with the fastest possible turnaround time. Previous studies have mostly highlighted the steps of the supply chain, but the needs for each level have not been properly defined (Kutnyashenko and Kints, 2021).

The ready-made clothing sector plays a significant part in the country's economic growth. However, until now, the needed textiles and a few restricted accessories have all been imported from overseas. Because the sector is strongly reliant on imports, which is the primary cause of lengthy lead times, it looks that Bangladesh's ready-made garment industry will be unable to compete effectively in the worldwide market in the near future

due to the presence of exceptionally long lead times. This is, in particular, the current study's key concern area (Arnett, 2021).

1.6 Research Objectives

Retailers and importers of garment items strive to obtain a competitive advantage by outsourcing to foreign locations. Distinct outsourcing locations have different advantages and disadvantages. An evaluation of Bangladesh as an outsourcing location based on specific outsourcing criteria might reveal its potential advantages to brands and retailers.

RO1. To identify the considering factors of apparel outsourcing
RO2. To know the intensity of the influence of these factors on the outsourcing decision
RO3. To investigate the effect of sourcing factors on textile-clothing industries of Bangladesh
RO4. To know the effect of these sourcing factors
RO5. To identify the relationships among sourcing factors

1.7 Research Questions

The research questions are as follows:

RQ1. What is the demand-supply structure of the textile-clothing industry in Bangladesh?
RQ2. What are the backward and forward linkages to the demand-supply structure?
RQ3. How the demand-supply structure influence textile-clothing sourcing?
RQ4. What are the roles of intermediaries between the distributors and producers?
RQ5. How the demand-supply flow of the raw materials influences the textile-clothing industries?

1.8 Research Hypotheses

Hypotheses based on the review of the literatures; the following hypotheses have been developed:

H1: Labor cost positively influences apparel sourcing
H2: Tariffs negatively influence apparel sourcing
H3: Quality positively influences apparel sourcing
H4: Lead time negatively influences apparel sourcing
H5: Exchange rate positively influences apparel sourcing

2. Literature Review

2.1 The Demand-Supply Review of Textile and Clothing Industry of Bangladesh

KeywordsTextile-Clothing Industry, Demand-Supply Chain, Input-Output Analysis, Linkage
Previous research on Bangladesh's textile and garment sector has mostly concentrated on the supply side. The supply side is concerned with the cost and time efficiency of manufacturing; whether or not production takes place, on the other hand, is determined by the product's demand. Because enterprises in Bangladesh create clothes based on client contracts, an examination of the demand side of the textile-clothing sector is critical. These are well-known brand merchants and distributors from throughout the world. These brand merchants are in charge of estimating demand and distributing Bangladeshi goods (Raju, 2019).

Bangladeshi companies make apparel with little awareness of the tastes of the end buyers (Islam et al., 2021). As a result, a detailed examination of the demand side is required. Clothing items have a different supply pattern than other products. As a result, a large number of research studies have concentrated on the industry's supply side (Woo, 2019)

2.2 Current State of the Textile-Clothing Industry of Bangladesh

In the textile-clothing industry, the phrase "Made in Bangladesh" is a source of pride for employees, firms, and customers. Bangladesh is the world's second-largest exporter of clothes, behind China. This industry is responsible for 84 percent of the country's export profits.

However, the country's value addition in this sector is gradually expanding. Textile-clothing companies in Bangladesh mainly have three types of production processes: I vertically integrated, which means they buy fiber and then process it into finished apparel; ii) semi-vertically integrated, which means they buy yarn and then convert it into finished clothing; and iii) horizontally integrated, which means they buy fabric and then convert it into finished clothing (Ethirajan, 2016).

The European Union's (EU) generalized system of preference (GSP) facility, a relaxation of laws of origin, and a duty-free quota facility from Canada, Australia, Japan, and members of the European Free Trade Agreement have all aided clothing export growth. Furthermore, the global financial crisis in the late 2000s benefited the Bangladeshi apparel industry since shoppers all over the globe turned to less priced clothes, a phenomenon known as the Wal-Mart Effect (Mohd Adnan and Valliappan, 2019).

2.3 Demand Side Review of the Textile-Clothing Industry of Bangladesh

Clothing has a short life cycle (summer items, winter products, etc.), a wide range of options, volatile and unpredictable demand, and a lengthy, inflexible supply process. The textile-clothing industry's demand side operations include understanding consumer expectations, age trends, impending events, and seasonal fluctuations, among other things, all of which are connected to demand forecasting and, as a result, the ability to develop the proper product. These efforts are carried out by companies' research and development departments (Abdulsalam and Nuhu, 2021).

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. Customer Analysis

2.3.2 Analysis of the Customer

Customers in the Bangladeshi garment business are mostly brand merchants and wholesalers. Bangladesh offers completed knit and woven clothes to these buyers. Retailers offer apparel goods purchased from Bangladesh via locations situated all around the world (Poh Phung, Valliappan Raju, and Haji Zanial, 2018). Bangladeshi businesses do not manufacture items based on anticipated demand. After receiving orders from merchants and wholesalers, they make items (Jiputra, Tarigan, and Siagian, 2020).

2.3.2 Forecasting of Demand

Demand Forecasting
Demand forecasting is the process of projecting future demand based on variables that influenced demand before. The apparel business is strongly reliant on precise demand forecasts. According to the statement, each fashion item has a brief and well-defined selling time that corresponds to one selling season (20–30 weeks) (Raju and Phung, 2020b). Fashion trends, seasonality, exogenous variables, seasonal data, end-of-season sales, sales promotions, and consumer spending power all have an impact on forecasting demand (Yue, 2021).

Inaccurate projections have a significant impact on supply chain performance in terms of higher inventory costs, back orders or sales losses, and customer goodwill throughout the supply chain. Local companies often get contracts from Western brand shops based on

cheap costs and short lead times. For contracts with long lead times (90 days or more), Western merchants and purchasers prefer Far East contractors. Bangladesh specializes in high-volume, low-cost garment manufacture and employs the world's biggest low-cost labor pool, allowing lead contractors to subcontract to execute orders on time and at a cheaper price per unit than lead contractors (Padmanabhan, Baumann-Pauly, & Labowitz, 2015).

Textile-clothing companies in Bangladesh do not start their operations with demand forecasting based on information from the point of sale or research office. Demand comes directly from brand merchants, as well as through agents and franchisees. 75 percent of the agents or franchisees, often known as middlemen, are foreign companies. Upon successful negotiation and completion of contract performance, these intermediaries get a fee ranging from 1% to 4% of the export earnings. As a result, firms in Bangladesh are not forecast-driven, since demand forecasting is performed and played a vital role by merchants and distributors (Akoglu and Zbek, 2021).
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Design and Development
2.3.3 Product Design and Development

Modeling/prototyping, detailed engineering, material sourcing, manufacturing, and distribution are the initial steps in producing new items in the fashion business. Bangladeshi clothing companies do not involved in design, distribution, or retailing. The analysis of the intended consumers/users is the first stage in the design process. The work of other designers shown in collections in locations such as Paris, Milan, and New York, as well as trade fairs from previous seasons, impact the creative process. The design is either done in-house or commissioned to a small design firm (Romani, Rognoli and Levi, 2021).

2.3.4 The Confirmation of an Order

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. Order Con rmation
Order confirmation is the most significant aspect of the demand side, which is prevalent in Bangladesh's apparel sector. Retailers, marketers, and branded manufacturers are the three categories of lead businesses in the garment sector, which is defined as a buyer-driven value chain. Bangladesh is where order-driven manufacturers congregate. Marketers and merchants are the ones who place manufacturing orders. Order-driven manufacturers make items in response to specific client requirements, whereas others make conventional products. In Bangladesh, the proprietors of textile-clothing factories are not active in marketing efforts (Valliappan Raju, Poh Phung and Kalimuthu, 2019). They serve as manufacturing centers under the control of middlemen or direct merchants to some extent (Bishop, 2020).

In Bangladesh, majority payments are done using documentary credit, which is generally known as letter of credit (L/C). Afterward, the manufacturers in Bangladesh employ this L/C as the financial source for the production (Nowaczyk et al., 2021) (Nowaczyk et al., 2021)

2.3.5 The Bilateral Relations

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. Bilateral Relations
Bilateral relations is another emerging factor on the demand side. Due to the failure of
On the demand side, bilateral contacts are another developing component. Clothing exports from Bangladesh face non-tariff impediments due to the lack of trade agreements. Bangladesh's exports have not benefited from preferential and free trade agreements. There is a larger level of illicit and informal bilateral commerce, as well as bilateral mistrust and political conflict. These factors have influenced demand for Bangladeshi clothes, notably the recently stopped US GSP facility for Bangladeshi clothing, which has influenced demand in the United States (Raju and Phung, 2020a).

2.4 Supply Side Review of the Textile-Clothing Industry of Bangladesh

The supplier begins the manufacturing process when the production contract is completed. In the demand-supply chain, this is the start of the supply side. The supply side includes obtaining raw materials, producing apparel, distributing completed items, and maintaining positive relationships with buyers and distributors (Romanelli, 2018).

2.4.1 Raw Materials and the Backward Linkages

Raw Materials and Backward Linkage
Obtaining raw materials, often known as the industry's backward linkage, is the first step of the supply side. Fiber, yarn, fabric, wet processing, and accessories are the different types of raw materials. Natural or synthetic fibers are produced by fiber manufacturers at the top of the supply chain. Bangladesh imports 99 percent of its raw cotton, according to the US Department of Agriculture (USDA). Raw-cotton imports are more or less consistent, while staple-fiber and yarn imports are skyrocketing in terms of apparel exports. Private fabric production companies in Bangladesh can primarily satisfy the demand for knit fabric in the sector. In contrast, the woven fabric industry remains reliant on imports (Mashkara-Choknadiy and Mayboroda, 2021).

Garments, accessories, and packaging (GAP) are essential in the textile-clothing export market, even though GAP apparel buyers account for a small fraction of product costs but are the most important in terms of production economics. 90 percent of domestic demand is met by this sub-sector. While the nation has mostly attained self-sufficiency in terms of

accessory supply, growth in fabric manufacture, particularly woven textiles, has been slower (Pradhan, 2021).

2.4.2 The Backward Linkages

Backward linkage. The above-mentioned supply side issues are known as the

The above-mentioned supply-side concerns are known as the garment industry's backward linkage. The phrase "backward linkage" refers to a sector's interconnectedness with the upstream sectors from which it buys inputs. Backward linkage refers to the dependency of industrial sectors on one another for inputs. The output multiplier effect, also known as the sector's pull power, is another term for backward linkage. The higher the backward connection index, the more inputs from other industries the sector gets. If the output multiplier is large, it suggests that a rise in final demand raises overall output, i.e., it activates other sectors by accepting inputs (Li et al., 2021).

The textile-clothing industry's manufacturing process is separated into fiber, yarn, fabric, and wet processing. Cloth milling and handloom cloth are two types of fabric. Knitted clothes and woven clothing are two types of clothing. Domestic firms may fulfill up to 70% of overall demand for fabric manufacturing firms, with the remaining 30% of yarn imported mostly from China and India. Among the manufacturing process components, handloom cloth has the most overall production ramifications. (Kornej and colleagues, 2021)

2.4.3 The Clothing Production

From order receipt (L/C confirmation) through delivery of finished goods, clothing manufacturing units go through a variety of steps. The production planning is the first step in the process. Raw materials planning, production capacity planning, line planning, task scheduling, and assigning duty-responsibility for each work are all examples of production planning (Huang and Rust, 2018).

Apparel production begins with the product design, which is done by the retailer-distributor. The designs are utilized to make pattern pieces, which are subsequently used to cut the fabric. Fabric is created to the specifications of the customer. Fabric development is locating or producing fabric for a certain consumer with matching features such as dyes and colors, among other things. The merchants create a fabric sample with certain patterns, such as stripes or checks, in the case of yarn-dyed textiles (Haque, 2018).

Payment. In the order confirmation stage, the payment method is also specified. In the

2.4.4 Payment

The payment method is also specified in the L/C at the order confirmation step. In the case of Bangladesh, documented credit or a letter of credit (L/C) is used to settle 99 percent of payments. When this occurs, it's time to make a payment claim against the importer. The shipping documentation and the payment-claiming document, i.e., the bill of exchange, are forwarded to the importer's bank when the items are delivered. The money is made to the exporter via the bank at this point (Mittal and Singh, 2021).

2.4.5 After Sales Service

Customer relationship management and after-sales support have become critical components of corporate success. Although the cycle stops when the client pays, since the industry is order-driven, the producer anticipates further orders from the same consumer to start a new cycle of production. Producers prefer to cultivate close connections with merchants in order to assure the receipt of fresh orders, which includes managing customer concerns (Ward, 2020).

2.4.6 Forward linkage

The phrase forward linkage refers to how a Forward linkage is connected to other Forward linkages. The phrase "forward linkage" refers to a sector's relationship to downstream industries. It's also known as an input multiplier. The input multiplier calculates the impact of a monetary unit change in a sector's principal input on all industries' input. The overall forward linkage coefficient of cloth milling is the greatest among the textile-clothing subsectors, according to input-output analysis; the yarn subsector has strong forward-linkage capability, followed by wet processing (Ellwood et al., 2021).

Comparison of forward linkage with some Asian countries. If the forward linkages
2.4.7 Comparison of forward linkage with some other Asian countries.

If the forward linkages are greater than average, it means that this industrial sector's production is more important than usual. When the forward linkage is computed, it shows that China, with 1.77 points, is the most domestically sound country in the textile and garment industry, followed by Vietnam. Domestically, Vietnam ranks second in terms of input multiplier (1.46). Sri Lanka's domestic and overall forward linkages remain low. Bangladesh has a forward linkage that is 22% lower than China and about equal to Vietnam and Sri Lanka. It is, nevertheless, 13% more expensive than India and 27% more expensive than Thailand. Except for China, the forward linking operations of Bangladesh and the studied nations are essentially same, according to our research (Cappers et al., 2011).

3. Research Methodology

This study's analysis is based on secondary data such as internet databases, digital libraries, books, journals, and conference papers, among other sources. Secondary data was gathered from a variety of sources, including books, journals, the Bangladesh Garment Manufacturers' and Exporters' Association (BGMEA), the Bangladesh Knitwear Manufacturers' and Exporters' Association (BKMEA), foreign buyers, reports, newspapers, and other Bangladesh-related publications. For this goal, published and unpublished materials, as well as articles accessible on the internet, have been evaluated.

The major data source, on the other hand, was interviews with experts, merchandisers from the garment industry, and purchasers from other nations in Bangladesh. Academic and practitioner research articles on textile supply chain management have been culled from prestigious international publications. Suggested study, sampling, study equipment, and data analysis are the four components that address the proposed technique (Valliappan Raju and Poh Phung, 2019).

3.1 Proposed Study

The goal of this research was to discover and assess sourcing determinants connected to Bangladesh's garment outsourcing and manufacturing capabilities. To do so, sourcing and purchasing specialists in the garment sector were contacted and requested to participate in an online survey. An online poll was created with factors relevant to garment outsourcing from other nations. Several scales, including open-ended questions, are employed to suit the study's aims. The factors for outsourcing have been taken from prior research (Newswire, 2014).

3.2 Sampling

Foreign clothing sourcing and purchasing experts, garment makers, merchandisers, and stakeholders in Bangladesh made up the study population. Purposive sampling, or the selection of participants based on a particular requirement, such as expertise or topic knowledge, provides the researcher with a sample of participants who have the skills to deliver the needed information. A convenience sample of industry experts was selected at random (Sindiani et al., 2020).

3.3 Study Instrument

When researchers need quantitative data to explore the views and attitudes of the study population, they often employ the survey method of data collecting. The poll includes questions on labor costs, tariffs, product quality, lead time, exchange rate, and demographics of participants (Ehrler et al., 2021).

3.4 Data Analysis

To evaluate the data, the Statistical Analysis System (SAS) Enterprise 6.1 program was employed. To determine whether the variables are independent or interdependent, a correlation test was utilized. A good approach for this investigation is principal component analysis with 'varimax' rotation. For subsequent analysis, the independent factors were taken into account. To identify a link between the dependent variable clothing import and various independent factors, a multiple regression analysis was used to evaluate observed data.

To classify the rankings of the factors and their influence importance on apparel import, the weighted technique was utilized. Hypothesis testing, respondent profiling, variable ranking, and research component evaluation were all part of the data analysis. Descriptive statistics were created to better understand the demographics of the participants. The constant comparative approach was used to code responses to the open-ended inquiry for content. This strategy enables the researcher to identify developing categories or themes in the replies of participants (Creswell, 2013).

4.0 Results and Discussion

4.1 Descriptive Statistics

In order to represent the overall lead time management in Bangladesh's readymade garment business, extensive interviews with important individuals in various departments were conducted. Participants 106 of the 122 replies were full and included in the analysis.

Seven respondents were removed from the final analysis because they abandoned the survey without answering any of the questions, while nine others had incomplete replies.

Table 4.1 shows that the majority of the participants (60%) were from mid-sized firms with 1001 to 5000 workers and big corporations with 5,000 or more employees. Only 38% of the participants had ever outsourced clothes from Bangladesh, whereas 62% had never outsourced apparel from Bangladesh. Only 46% of participants were aware of the services provided by Bangladesh's vertically integrated suppliers.

According to descriptive study, 29% of participants are presently working with vertically integrated suppliers from various nations, while 35% had worked with vertically integrated vendors from Bangladesh at some point in their careers. The Importer category had the most participation (46%) while the Retail Brand category had the least (23%) participants (see Table 4.1). In Bangladesh, just 9% of participants had prior experience with vertically integrated suppliers (see Table 4.1).

Table 4.1 Participant Characteristics (N=106)

Characteristics	**Total**	**Percentage**
Organization Type		
Retail Brand	24	23
National Brand	33	31
Importer	49	46
Others	0	0
Number of Employees in Organization		
0 – 100	0	0
101 – 1000	29	27
1001 – 5000	63	60
Greater than 5000	14	13

Previous experience outsourcing from Bangladesh Yes No	39 67	38 62
Currently use a vertically integrated vendor Yes No	30 67	49 71
Previously used a vertically integrated vendor in Bangladesh Yes No	36 70	35 65
Familiar with services offered by vertically integrated vendors in Bangladesh Yes No	49 57	46 54

When it comes to outsourcing clothes, the findings of the outsourcing factors suggest that low-cost labor is the most important issue for the participants (see Table 4.2). The second and third most critical issues were determined to be product quality and lead time, respectively. When it comes to garment outsourcing from international locations, 94 percent of the participants said currency exchange rates are the least of their worries. This supports prior results that low-cost labor and uniform garment product quality are influencing variables in apparel outsourcing (Khalatur, Vinichenko and Volovyk, 2021)

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Table 4.2 Importance of the Constructs

Land	**Labor Cost**	**Import Tariff**	**Product Quality**	**Lead-Time**	**Currency Exchange Rate**
1st Frequency	100	0	3	1	2
Percentage	94	0	3	1	2
2nd Frequency	2	4	98	2	0
Percentage	2	4	92	2	0
3rd Frequency	0	20	2	82	2
	0	19	2	77	2

Percentage					
4th Frequency	2	79	2	21	2
Percentage	2	74	2	20	2
5th Frequency	2	3	1	0	100
Percentage	2	3	1	0	94

4.2 Measurement Assessment

The data was evaluated in stages, each of which followed a set of defined statistical processes. The first part entails determining the scale's validity. Exploratory Factor Analysis (EFA) was used using SAS to identify the dimensions of the constructs. Variables were analyzed using Principal Component Analysis (PCA) to investigate the EFA, and Varimax Rotation was used to rectify any oblique influence on component output. Any structure with a loading of less than 0.600 was discarded. To prevent biases, constructs with dual loading were also removed. Five components with Eigen values larger than one were indicated using Scree Plot. Table 4.3 shows the rotated component matrix with the items and factor loadings.

Table 4.3 EFA Results for Study Constructs

Component	Item	Loading
Labor Cost	Cut and sew costs in Bangladesh are comparatively lower than other countries	0.802
	One of the main reasons for outsourcing apparel from Bangladesh is low product costs	0.823
Import Tariff	Apparel import tariff for Bangladesh is considerably higher than other countries	0.879
	Import tariff has negative impact on apparel outsourcing	0.703
		0.862

	Import tariff is an obstacle to import apparel from Bangladesh	
Product Quality	Bangladesh is a right destination for sourcing basic apparel items	0.824
	Bangladesh is a right destination for sourcing complex designed apparel	0.825
	You are satisfied with the workmanship of the apparel sourced from Bangladesh	0.896
Lead-Time	Vessel shipping time from Bangladesh is comparatively higher than other sourcing countries	0.865
	Air shipment is not a feasible way for apparel transportation	0.866
Currency Exchange Rate	Higher exchange rate of US dollar against Bangladeshi Taka (US $ 1.00 = 79.00 BDT) has an influence on apparel sourcing from Bangladesh.	0.974
	When US dollar gets strong against other currencies, it causes an increase in import from that destination.	0.957

Cronbach's (1951) alpha for internal consistency (= 0.75) was used to determine the reliability of the questionnaire questions. The items with a dependability of 0.70 or above were considered reliable and were kept. The constructions' dependability is shown in Table 4.4.

Table 4.4 Reliability Scores of Study Constructs

Constructs	Cronbach's Alpha	Number of Items
Labor Cost	0.822	2
Import Tariff	0.842	3
Product Quality	0.832	3
Lead Time	0.836	2
Currency Exchange Rate	0.841	2

4.3 Hypothesis Testing

4.3.1 Likert Scale Output Testing

Arithmetic average was calculated for Likert scale scores on the basis of the relevant constructs (see Table 4.5). Results of Likert scale analysis revealed:

Table 4.5 Likert Scale Output

Constructs	Mean	Standard Deviation
Labor Cost	6.42	1.26
Import Tariff	6.25	2.26
Product Quality	6.48	1.78
Lead Time	5.32	1.19
Currency Exchange Rate	3.95	1.07

4.3.2 Regression Output Testing

To evaluate the provided hypotheses and assess the connection between the variables, as well as the effect of the constructs on garment outsourcing from Bangladesh, multiple regression was used (Raju and Phung, 2019a). Multiple regression assumptions (linearity, normalcy, collinearity, and homoscedasticity) were examined (Hair et al., 2010). Table 4.6 shows that the results of the multiple linear regression were significant. Four of the five outsourcing constructs predicted Bangladeshi apparel outsourcing.

The overall model was significant ($F=16.82$, $R^2=0.434$). Results of hypothesis testing based on multiple regression results revealed:

H1: Labor cost positively influences apparel sourcing from Bangladesh. H1 was supported as labor cost positively influenced apparel sourcing from Bangladesh ($\beta=0.574$, $t=4.07$).

H2: Tariffs negatively influences apparel sourcing from Bangladesh. H2 was supported as import tariffs negatively influenced apparel sourcing from Bangladesh as β= -0.2 and t= -1.44.

H3: Quality positively influences apparel sourcing from Bangladesh. H3 was supported by the data (β=0.427, t=3.60).

H4: Lead time negatively influences apparel sourcing from Bangladesh. H4 was also supported (β= -0.045, t= -1.45).

H5: Exchange rate positively influences apparel sourcing from Bangladesh. H5 was rejected based on the negative coefficient value (β= -0.03) and p-value>0.05.

Table 4.6 Result of Regression Analysis (N=106)

Dependent Variable (Apparel Outsourcing from Bangladesh)

Independent Variables	Standardized Regression Coefficient (beta)	t value	Significance
Labor Cost	-0.574	4.07	0.000
Tariffs	-0.200	-1.44	0.041
Product Quality	-0.427	3.60	0.000
Lead Time	-0.045	-1.45	0.043
Currency Exchange Rate	-0.030	-0.46	0.649
F- value	16.82		
Adjusted R^2	0.434		

Labor costs, tariffs, product quality, lead time, and currency exchange rate all predicted 43 percent of the variation in garment outsourcing from Bangladesh, according to the findings. F (1, 106) = 16.82, P less than 0.001 indicated that the prediction was statistically significant (Table 4.6).

Four hypotheses were supported by the study's findings, whereas one hypothesis was not. The outcomes of the hypotheses are summarized in Table 4.7. Low-cost labor, consistent product quality, import duties, and lead time all have an impact on clothing outsourcing from Bangladesh, according to the findings. The impact of currency value on garment sourcing from Bangladesh was not substantial enough in this research (Geng, 2021).

Table 4.7 Summary of Hypotheses and Results

H	Hypotheses	Results
H1	Labor cost positively influences apparel sourcing from Bangladesh	Supported
H2	Tariffs negatively influences apparel sourcing from Bangladesh	Supported
H3	Quality positively influences apparel sourcing from Bangladesh	Supported
H4	Lead time negatively influences apparel sourcing from Bangladesh	Supported
H5	Exchange rate positively influences apparel sourcing from Bangladesh	Not Supported

4.4 Results of Open Ended Question

What has been your experience with or view of the service given by the vertically integrated suppliers in Bangladesh?" is an open-ended question. 11 people provided detailed responses. Their written remarks added to our understanding of their perspectives and experiences with sourcing from Bangladesh. The contrast between vertically integrated vendors and merely cutting and sewing ("cut & sew") providers was one of the most often debated subjects. Vendors who are vertically integrated have a 70% preference over those that merely "cut and sew" (Sehgal, 2011).

Vertically integrated suppliers are superior than cut-and-sew providers in terms of quality and service," one participant said. "Comparatively better than stitching vendors" and "One stop solution and better lead time" were among the other comments (Hasan, 2017). "I have not dealt with vertically integrated suppliers in Bangladesh, but I have worked with vendors who have manufacturing in Bangladesh," stated just one member. In general, because to its geographic position, getting items to the clothes buyer's destination is more difficult" (Panorama Consulting Group, 2021).

5. Conclusion and Recommendation

Order-driven manufacturing is time-consuming and requires a significant amount of time for order negotiation and confirmation. In reality, the forecast-driven strategy aids in the reduction of extra costs for intermediaries, who now need 1 percent to 4% of the overall invoice value. Adjustments in production specifications might sometimes lead to changes in production settings; nevertheless, the proposed strategy will save businesses from such inconvenient measures. It's an excellent approach for dealing with cash flow issues. Payment is received by the manufacturers at a fairly late stage in the order-driven strategy, since 99 percent of the payment is paid by L/C.

Order-driven systems cause cash flow issues during manufacturing. Producers prefer to establish close connections with merchants in order to secure the receipt of fresh orders, which incurs more cost and time. However, the transition is not without its difficulties. Firms and government agencies should learn how to estimate demand and develop new goods and marketing strategies. Firms can't afford to spend more to become forecast-

driven given their present financial situation. It is difficult to fund research and build human capital to replace foreign human resources (Arnaud et al., 2021).

Furthermore, there may be a difficulty with brand image, since a brand from a third-world nation may not be trendy among first-world customers. As a result, the forecast-driven entire package production model aids in increasing profitability and firm independence; lowering production costs, seasonal unemployment, time to market, payment uncertainties, and reliance on order supplier willingness; and, finally, ensuring balanced industry development. Although it necessitates a significant investment, incorrect demand forecasting may result in severe profitability and image issues for fashionistas (Balchandani et al., 2020).

The basic power of demand side management, branding, provides much more monetary value than the production value contributed. White collar occupations are created through branding. In the end, it establishes a manufacturing identity. South Korea, which was a manufacturing nation in the 1960s and 1970s but today has numerous enterprises with their own brands, is an example of such a strategy. For the time being, if a country can create its own brand, it can outsource manufacturing. For example, European countries, the United States, Japan, Hong Kong, Taiwan, Korea, Singapore, and others had their own brands and manufacturing facilities, but now they only manage demand and outsource manufacturing assembly (Smith, 2021).

As a result, the sector will exist in the future as the nation (Bangladesh) grows provided the government begins complete package production today, i.e. forecast-driven manufacturing under Bangladeshi management. Companies must discover alternate methods to use local raw resources, such as jute fiber, to lessen their reliance on imported raw materials. It is proposed that jute fiber be utilized in garment manufacture, since textiles made from jute-cotton mixed yarns are most suitable for clothes worn in the winter. In this area, further study is required. The government should set aside specific funding to sponsor research efforts in order to enhance the top tier of the supply chain (Sehgal, 2011).

Firms must also help researchers by establishing sophisticated labs in educational institutions and allowing them to access their (firms) production infrastructure or other resources (researchers). The demand-supply (Ikua, John Obwa, and Japhan Omoke, 2021) structure might be made more beneficial for Bangladesh in the near term if the involvement of foreign middlemen could be reduced. It is critical to create human capital to replace foreign human resources in order to reduce the role of foreign middlemen. To address this problem, the government should institutionalize education and training in this field (Ikua, John Obwa and Japhan Omoke, 2021).

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