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A Sustainable Development Strategy for the Uzbekistan Textile Industry: The Results of a SWOT-AHP Analysis

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Abstract: Uzbekistan is paying great attention to the textile industry as an industry offering a traditional production advantage, coming to the conclusion that it is necessary to establish and implement effective policies. In Uzbekistan as in other developing countries, whereas there are many strategic directions and development strategies to be considered for key industries, investment resources are limited. Therefore, it is necessary to prioritize and to apply limited resources accordingly. Even though research on the textile industry in Uzbekistan is ongoing for a long time, most of the resultant literature concerns only general industrial trends and pertinent investment and advancement strategies. The present study examined sustainable, concrete, and effective development strategy directions for the Uzbekistan textile industry using strengths, weaknesses, opportunities, and threats (SWOT) analytic hierarchy process (AHP) model. The SWOT-AHP model was tested in a case study on Uzbekistan's textile industry. In the case study, the results were presented in an illustrative way by utilizing the quantitative information achieved by the model. The results indicated that the weakness and opportunity (WO) strategy had the highest importance, and suggested accordingly that priority should be given to that strategy for Uzbekistan's textile industry development. The results further suggested that the Uzbekistan government should endeavor to upgrade obsolescent technology and solve the problems of high-priced imported raw materials and workers' low education level, which are weak points of the textile industry of that country. Also, Uzbekistan should gradually shift the industrial structure from raw cotton to finished textile exportation, which offers relatively high added economic value. To achieve this, the Uzbek government needs to promote joint ventures and strategic alliances with foreign companies wishing to enter the textile industry through foreign direct investment (FDI) schemes.

Keywords: textile industry; SWOT; AHP; decision analysis

1. Introduction

According to the Korea Trade Investment Promotion Agency (KOTRA), agriculture, one of the largest segments of Uzbekistan's economy, accounts for one-fifth of total gross domestic product (GDP) [1]. In contrast to the remarkable contraction of the agricultural economy of most Commonwealth of Independent States (CIS) countries in past years, agricultural production in Uzbekistan grew greatly every year since the 2000 implementation of a strong agricultural development policy that includes, among other initiatives, an agricultural land improvement project to expand both cultivation area and irrigation facilities. Uzbekistan produces three million tons of cotton per year, of which 1–1.1 million tons is processed as cotton yarn. In addition, Uzbekistan is the sixth largest cotton producer and the fifth largest cotton exporter in the world, showing a well-developed structure concentrated on cotton, which gives it its high percentage of the international cotton market.

Textile production in recent decades increasingly moved from Europe and the United States to Southeast Asia, Central Asia, and South America. Among Central-Asian states, Uzbekistan is a major exporter of cotton fiber. Due to the expiration of the Multi Fiber Agreement (MFA) and the consequent cancellation of world quotas in 2005, competition in the world market became increasingly fierce. As a result, only those producers who supply high-quality products at a low cost can emerge as winners [2]. Against this backdrop, developing countries are doing everything they can to attract foreign technologies and investors while searching for their niche in the global market. The gains from attracting foreign investors are surely considerable for those countries that invested a lot in improving their textile industries [3]. Consequently, the Uzbekistan government is actively instituting programs to attract foreign investments into the textile industry. The principal intention of attracting foreign direct investment (FDI) in the textile sector is to engage foreign companies that are capable of producing high-quality, value-added products that use high-grade cotton fiber made in Uzbekistan.

Uzbekistan's textile industry, as one of its most key national industries, has an important role to play in the development of the country's economy. Since the textile industry's profits lead to deepening and broadening of the national manufacturing system overall, its transformation from cotton exportation to manufacturing of goods will enhance the national economy's capacity to insulate itself from instability in the commodities market [4]. The textile industry can also certainly alleviate the problems of unemployment and poverty in Uzbekistan by employing sizable numbers of under-skilled labor, especially from rural areas, and women [5]. Thus, the Uzbekistan government paid great attention to the textile industry and established sustainable development plans for its improvement. Additionally, it is making efforts to attract foreign investment and is pursuing privatization and private investment to accelerate the development of the textile industry by utilizing the benefits of rich cotton and cotton yarn, cheap labor and infrastructure resources (i.e., water, natural gas, electricity, etc.), and its domestic market (the largest population in Central Asia). Uzbekistan's main products such as fabrics, textiles, and yarns steadily increased in production, although most of the production facilities are concentrated on the spinning process, to the detriment of knitting, dyeing, and processing, not to mention the garment-sewing sectors. Specifically, as of 2016, the textile industry produces 550,000 tons of cotton, about 480 million m² of fabric, about 100,000 tons of stockinet, 411 million garments, and 85 million pairs of hosiery [6]. The quality of cotton is somewhat lower than that of Sea Island cotton and Egyptian cotton in the West Indies system of the Bahamas, but it is considered to be superior to those of major competitors such as China, India, and Pakistan. It also has an advantage over India and Pakistan in terms of export competitiveness [1].

A number of studies on general textile industry trends and investment strategies for Uzbekistan were conducted. Some of them utilized strengths, weaknesses, opportunities, and threats (SWOT) analysis and suggested macroeconomic development directions and strategies for the Uzbekistan textile industry. SWOT analysis is a commonly used tool for analyzing internal and external environments in order to attain a systematic approach and support for a decision situation [7]. The internal and external factors deemed most important to an enterprise's future, referred to as strategic factors, are summarized within the analysis. The final goal of a strategic planning process, of which SWOT is an early stage, is the development and adoption of a strategy that produces a good fit between internal and external factors. SWOT also can be used when a strategy alternative emerges suddenly and the decision context relevant to it has to be analyzed. However, conventional SWOT analysis has a disadvantage, which is the difficulty of measuring the priorities and importance of derived factors; as such, utilization of SWOT analysis is limited to the identification of sustainable and effective development strategies. As pointed out in Kurttila et al. [8], SWOT analysis provides no means of analytically determining the importance of factors or of assessing the fit between factors and decision alternatives, and it is regarded as a limitation of SWOT analysis application. In other words, the conventional studies on general textile industry trends and investment strategies for Uzbekistan using SWOT analysis are primary approaches for establishing strategies based on the strategy factors and do not provide qualitative examinations such as priority and importance among strategy factors.

As concluded by Hill and Westbrook [9], SWOT analysis results are too often superficial and imprecise listings or incomplete qualitative examinations of internal and external factors. The further utilization of SWOT is, thus, based mainly on qualitative analysis, as well as the capabilities and expertise of the persons participating in the planning process.

The objective of this study was to investigate SWOT factors more systematically in order to improve the quantitative information basis of any proposed strategic directions for the Uzbekistan textile industry. This research suggests, based on its SWOT analytic hierarchy process (AHP) analysis, sustainable and effective development strategies for the Uzbekistan textile industry. For the SWOT-AHP analysis, SWOT provided the basic framework within which to perform the analysis of the decision situation in the Uzbekistan textile industry, and the analytic hierarchy process (AHP) analysis assisted in enabling the SWOT analysis to be carried out more analytically, specifically by determining the priorities for the factors included in the SWOT analysis and making them commensurable. The AHP enables decision-makers to represent the simultaneous interaction of many factors in a complex, unstructured situation. It helps them to identify and set priorities on the basis of their objectives and their knowledge and experience of each problem [10]. In order to apply the SWOT-AHP analysis to the Uzbekistan textile industry, we firstly took a look at the SWOT-analysis-based research that was carried out in broadly examining the textile industry in Uzbekistan. Then, the SWOT matrix for the Uzbekistan textile industry development strategy was established by integrating, classifying, and adjusting the SWOT analysis results derived from the previous studies. The AHP analysis was used to quantify the importance and priority of the components of the SWOT analysis. In particular, in order to increase the validity and effectiveness of the research by duplicating the questionnaire to the same company, we surveyed 75 textile companies in Uzbekistan by contacting experts in each company to collect data for the AHP analysis. On this basis, we were able to provide concrete, effective, and sustainable strategy directions reflective of rational selection and prioritization within a context of limited resources. The main advantage of the proposed approach and the difference from the other relevant research lies in the quantitative examination of the SWOT factors by applying AHP in SWOT analysis and the inclusion of the preferences of the decision-maker in planning and implementing the development strategies. The rest of this paper is organized as follows: Section 2 reviews the precedent research on the textile industry in Uzbekistan and demonstrates the construction of the SWOT matrix. Section 3 explains the present research design and analysis methods. Section 4 discusses the AHP analysis results and strategy alternatives. Section 5 summarizes our work.

2. Background Research

2.1. Literature Review and SWOT Matrix Composition

The literature review consists of two parts: general studies on the textile industry in Uzbekistan and SWOT-analysis-based development strategies for Uzbekistan's textile industry. Several studies on the textile industry in Uzbekistan were conducted. Davronov [11] and Nargiza [12] examined the export and market potential of the Uzbek textile industry. They argued that the textile industry plays an important role not only in producing non-food consumer goods but also in fulfilling a social need in promoting the creation of new jobs. Djanibekov et al. [13] analyzed the pros and cons of Uzbek cotton, and emphasized that the production of cotton is a strategic centerpiece of the economy of Uzbekistan, which ranks second among world cotton exporters. As noted in Rudenko [14], according to historical evidence, cotton was cultivated in what is now Uzbekistan since the fifth or sixth century. Maurizio et al. [3] explored cotton taxation in Uzbekistan. Based on several calculation methods, they concluded that Uzbek cotton is too heavily taxed. Ergashxodjaeva et al. [15] focused on an evaluation of the textile clothing sector and clustering capabilities in Uzbekistan. They determined that the development of the light industry goods market depends primarily on the overall competitive environment in the industry and the factors that shape it. Mamadiyev [16] investigated the strengths and weaknesses of the textile industry in Uzbekistan. He mainly provided specific data on the textile industry and

provided a descriptive analysis of each factor. He came to the conclusion that the following problems hinder textile industry development: outdated technology, a low utilization ratio, a high tax burden, an unstable financial situation for enterprises, the absence of financial incentives between farmers and cotton-fiber-producing plants, and a lack of FDI. Revetria et al. [17] focused on the necessity of rationally employing existing capacities and resources and the significance of the textile industry (and light industries generally) to the national economy. Also, some of the aspects of developmental strategies were discussed, and aspects of foreign countries' advantages were analyzed. Furthermore, institutional, production, and technical capabilities for further development were identified, and the effective use of present resources, as well as key means of stimulating productivity, was identified.

Several studies applied SWOT analysis to suggest development strategies for Uzbekistan's textile industry. Based on our review of this literature, we established a SWOT matrix by classifying, organizing, and integrating the SWOT factors identified in those studies. In Knowledge Sharing Programs funded by KORTA and the Korea Development Institute (KDI), Uzbekistan and South Korea discuss all relevant economic areas such as special economic zones, public policy, and industrial development strategies. Especially, in Knowledge Sharing Programs held in 2016 and 2017, SWOT analysis and comparative analysis were utilized to suggest development strategies for Uzbekistan's textile industry [4]. The strengths of Uzbekistan's textile industry lie in its rich materials (raw cotton and cotton yarns), cheap labor, low-cost energy sources such as electricity and gas, a large domestic market (32 million consumers), access to the CIS and European markets, duty exemptions and tax benefits for raw materials, and an organization that can implement strong textile policies. The drawbacks of Uzbekistan's textile industry include its weak basis for chemical fibers, which are essential given the recent trend toward functional textiles in the global market, and its relatively low-tech and obsolescent manufacturing base focusing on the exportation of cheap, general-purpose articles. Other issues include weaknesses in the logistics environment in terms of duration and cost due to its inland location, government control and lack of cooperation among branches, lack of water and low mechanization rate in the cotton industry, and a dependency on importation of materials due to the unavailability of local materials for apparel production. Opportunity factors include expansion of new fashion trends through global sourcing, production with buyer compliance, possible growth of the high-potential CIS market, entry to the Eurasia Economic Cooperation, and the United States of America (USA)'s regulations on Chinese exports. Threats include environmental policies and CSR reinforcement in advanced countries, technical subordination by advanced countries, and mid-to-low-price market encroachment from China and Vietnam. Tursunov [18] investigated a development strategy for the textile industry by means of a SWOT analysis. The textile industry in Uzbekistan has a high but thus far unrealized potential. It has considerable competitive advantages both in the domestic and international markets through the possessing of local raw materials. The high potential of textile industry development, in fact, could be one of the "growth points" for the entire national economy. However, government policy prioritizing exportation of cotton fiber, along with minimization of its processing and exportation of ready-made products, leads to considerable risk for the national economy due to instability of world prices for cotton fiber, especially during periods of their sharply falling prices. Textile and garment suppliers from Uzbekistan have advantages and disadvantages in the market. Their main advantage is the existence of a raw material base in Uzbekistan, especially high-quality cotton, which gives an opportunity for further development and expansion of textile manufacturing. Uzbekistan produces more than one million tons of cotton fiber per year, but only a fraction of that is used by domestic textile enterprises. The proximity of raw materials sharply reduces transport costs and time for delivery to enterprises. A no less important advantage is Uzbekistan's labor cost, which is cheaper than in rival countries. The literacy rate in Uzbekistan is almost universal at 98%, and workers are generally well educated and trained. Even though most local technical and managerial training does not meet international business standards, foreign companies engaged in production report that Uzbek workers learn quickly and work effectively. Furthermore, as Uzbekistan leases crude oil and natural gas, it has some advantage in resource costs over rival countries such as

China and Turkey. As for the cost of water in Uzbekistan, while water use in the textile industry is not so extensive, the relatively low water price affords some additional competitive advantages to the industry. Tillyakhodjaev [19] provided marketing strategic planning for an Uzbek textile and clothing supply chain by SWOT analysis. The author recommended that the textile and clothing supply chain be segmented into high- and low-profit steps: retailers and brands should keep high-profit steps such as innovation, marketing, and retailing, while low-profit steps, such as sourcing raw materials, production and assembly, finishing, and packing, should be outsourced to mid-chain suppliers and low-cost producers worldwide. Indeed, global supply chains established labor-intensive exports from low-cost locations, especially Far East regions. The result was enormous growth in the number of producers and, thus, increasing competition.

The SWOT analysis results of the abovementioned studies are summarized in Tables A1–A4 (Appendix A).

2.2. Concept of AHP Analysis and Outline for Applying AHP in SWOT Analysis

AHP is the decision-making methodology which reflects the experiences and intuition of respondents through pairwise comparison of the factors forming the hierarchical structure in decision-making. It creates a pairwise comparison matrix, utilizes the eigenvalue method from its matrix, and estimates priority vector per a hierarchy. Numerical techniques are used to derive quantitative values from the verbal comparisons. The advantages of AHP include its ability to make both qualitative and quantitative decision attributes commensurable, and its flexibility with regard to the setting of objectives. Subjective preferences, expert knowledge, and objective information can all be included in the same decision analysis. To solve the matters concerning the decision-making and judgment of importance of the experts, the AHP analysis has to go through four steps of process: (1) establishing the hierarchical model with factors; (2) conducting pairwise comparison among factors; (3) calculating the relative weighted value of factors; and (4) integrating the relative weighted value in evaluating factors. In the first step, a matrix with pairwise comparison sub-hierarchy factors using nine scales is established. If the number of components in the hierarchy is n , the number of pairs occurring in the pairwise comparison is $n(n - 1)/2$. If the importance is defined as v_a by pairwise comparison of n factors composed in one hierarchy, r_{ab} and v_a in the pairwise comparison matrix are calculated as $r_{ab} = v_a/v_b$ ($a, b = 1, 2, 3, \dots, n$). Only the most important concepts of the AHP theory are presented here. For more details on the AHP analysis, readers are referred to References [10,20].

Basically, the results of an AHP analysis are the overall priorities of decision alternatives. The basic concept in utilizing AHP within a SWOT analysis is to systematically evaluate SWOT factors and commensurate their intensities. AHP's advantages, i.e., a systematic approach to decision problems and commensurateness, can be regarded as valuable characteristics in SWOT analysis. Additional value from a SWOT analysis can be achieved by performing pairwise comparisons between SWOT factors and analyzing them by means of the eigenvalue technique as applied in AHP. This offers a good basis for examining the present or anticipated situation, or a new strategy alternative, more comprehensively. After carrying out these comparisons, decision-makers will have new quantitative information about the decision-making situation, for example, whether there is a specific weakness requiring all the attention, or if the company is expected to be faced with future threats exceeding the company's combined opportunities.

3. Research Design

The research design proceeds in two steps: (1) SWOT matrix composition; (2) SWOT-AHP analysis and sustainable development strategy suggestions.

The first step, SWOT matrix composition, analyzes the previous studies on SWOT analysis for the textile industry of Uzbekistan, and extracts their SWOT factors for SWOT analysis a little more widely. The extracted SWOT factors are refined through deduplication, classification, and consolidation and grouped into four SWOT groups: strengths, weaknesses, opportunities, and threats, in order to

compose the SWOT matrix. In particular, brainstorming and consultation with experts working in the textile industry, academia, and related organizations in Uzbekistan was conducted to ensure the validity of the SWOT matrix.

The second step, SWOT-AHP analysis and sustainable development strategy suggestions, applies pairwise comparisons to capture the weights of each SWOT group, and derives the relative priorities of each factor within the SWOT group by applying AHP. Based on the result of the AHP analysis, we suggest analytical and sustainable development strategies in terms of four strategy divisions: strength opportunity (SO), strength threat (ST), weakness opportunity (WO), and weakness threat (WT), according to the priorities of SWOT groups and factors.

The AHP is a mathematical method developed by Saaty [20,21] for analysis of complex decision problems with multiple criteria. The AHP is basically a general theory of measurement based on some mathematical and psychological foundations, and it can deal with qualitative attributes, as well as quantitative ones. The results of an AHP analysis are the overall (global) priorities of decision alternatives. The idea of utilizing AHP within a SWOT framework is to systematically evaluate SWOT factors and determine their intensities. The advantages of AHP application can be regarded as valuable characteristics of SWOT analysis. Additional value from a SWOT analysis can be achieved by performing pairwise comparisons between SWOT factors and analyzing them by means of the eigenvalue technique as applied in AHP. This offers a good basis for examining the present or anticipated situation, or a new strategy alternative, more comprehensively. After carrying out these comparisons, decision-makers will have new quantitative information about the decision-making situation, for example, whether there is a specific weakness requiring complete attention, or if the company is expected to be faced with future threats exceeding its combined opportunities. Another example is that when it is observed that one single weakness is larger than all of the strengths, the strategy chosen could perhaps be aimed at eliminating this weakness. Similarly, choosing a new strategy should probably not be based merely on opportunities and omitting existing threats if they are of same magnitude.

The present SWOT-AHP analysis proceeded in three stages as shown in Figure 1. The first stage established development strategies for the Uzbekistan textile industry, the second stage set four SWOT groups, and the third stage set four factors for each SWOT group (16 factors in total). Prior to the AHP analysis, a questionnaire-based survey of experts from Uzbekistan textile companies was conducted by meeting the experts directly and collecting survey data from them to increase the effectiveness of the AHP analysis. Based on the survey results, we analyzed the importance (weight) of each SWOT group and derived the relative priorities of each factor within the SWOT group only for data with a consistency ratio (CR) of 0.1 or less. As a result of the AHP, priority was assigned based on the importance of SWOT factors, and a concrete and effective development strategy for each type and size of Uzbek textile company was presented.

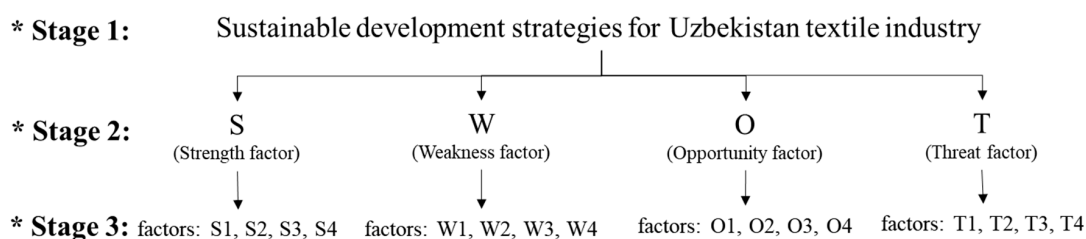


Figure 1. Three stage of the strengths, weaknesses, opportunities, and threats (SWOT) analytic hierarchy process (AHP) analysis and number of factors in each stage.

Since the questionnaire-based survey was conducted to obtain priorities of factors within each SWOT group through AHP analysis, the question configuration followed the principles of Reference [10], the developer of AHP analysis. The crux of the matter in the question configuration is the number of factors for performing pairwise comparisons in each SWOT group, because a large number of

comparison factors makes it difficult for the respondent to maintain concentration. Given that Saaty [10] emphasized that the number of pairwise comparison elements should not exceed a maximum of 7 ± 2 , the number in this study was six ($= 4(4 - 1)/2$), because the SWOT-AHP matrix consisted of four SWOT groups and each group contained four factors, as shown in Figure 1. Therefore, the questionnaire for SWOT-AHP analysis consisted of 30 pairwise comparison questions ($= 6 \times 5$ pairs of five matrices); that is, the evaluation was performed five times for six pairwise comparisons in the questionnaire. In general, in the questionnaire configuration for the AHP analysis, when the number of questions is large, the respondent's input can be increased and their concentration decreased, so that it becomes difficult to maintain consistency of responses. The questionnaire of this study evaluated the relative importance on a nine-point scale, which was proven to be the most useful for AHP analysis (Saaty, 2007). Table 1 shows the combinations of pairwise comparisons of the questionnaires as evaluated on the nine-point scale.

Table 1. Combinations of pairwise comparisons in stages 2 and 3. SWOT—strengths, weaknesses, opportunities, and threats.

Stages	Combinations of Pairwise Comparisons
Stage 2 (6 comparison questions)	$(S : W), (S : O), (S : T), (W : O), (W : T), (O : T)$
Stage 3 (24 comparison questions)	$(S_1, S_2), (S_1, S_3), (S_1, S_4), (S_2, S_3), (S_2, S_4), (S_3, S_4)$
	$(W_1, W_2), (W_1, W_3), (W_1, W_4), (W_2, W_3), (W_2, W_4), (W_3, W_4)$
	$(O_1, O_2), (O_1, O_3), (O_1, O_4), (O_2, O_3), (O_2, O_4), (O_3, O_4)$
	$(T_1, T_2), (T_1, T_3), (T_1, T_4), (T_2, T_3), (T_2, T_4), (T_3, T_4)$

4. Empirical Analysis and Sustainable Development Strategies Proposal

4.1. SWOT Matrix Composition

The procedure of the SWOT analysis consisted of (1) identifying opportunities and treats as the external environment part, (2) identifying strengths and weaknesses as the internal environment part, and (3) composing a SWOT matrix by classifying the factors for the opportunity, threat, strength, and weakness groups in the external and internal environment parts. The SWOT matrix for the analysis of the Uzbekistan textile industry was composed by extracting the SWOT factors for each SWOT group from the previous studies on SWOT analyses of the textile industry in Uzbekistan, the factors of which are summarized in Tables A1–A4 (Appendix A). As aggregated, integrated, and classified from Tables A1–A4 (Appendix A), the SWOT factors are summarized in Table A5 (Appendix B). In that Tables A6 and A7 (Appendix C), note that we classified the SWOT factors that appeared three times or more, and determined the final factors to be applied to this study through three rounds of expert discussions and adjustment processes, thereby deriving the SWOT matrix shown in Table 2.

Table 2. SWOT matrix for Uzbekistan textile industry.

S (Strength)	W (Weakness)
<ul style="list-style-type: none"> Cheap highly skilled labor cost Low utility prices and cheap raw materials Government support, benefits, and incentives Advantages in strategic proximity to huge market 	<ul style="list-style-type: none"> People are undereducated Low technical level Imported materials are expensive Weaknesses in logistics environment
O (Opportunity)	T (Threat)
<ul style="list-style-type: none"> Development of manufactured textile goods instead of cotton fiber Possible growth of foreign market Expansion of new fashion trends Favorable conditions for foreign investments 	<ul style="list-style-type: none"> Fashion market with rapid design change Growing competition because of new entrants to the industry Reduction of Uzbekistan's major textile-product-importing countries Growing requirement for trade in advanced countries

4.2. SWOT-AHP Analysis

For the AHP analysis, we composed the three-stage hierarchy SWOT-AHP model shown in Figure 2. The first stage was the ultimate goal of establishing the development strategies for the Uzbekistan textile industry, and the second stage was composed of the four groups of the SWOT matrix: strengths, weaknesses, opportunities, and threats. The third stage was composed of 16 factors, which are the four factors for each SWOT group.

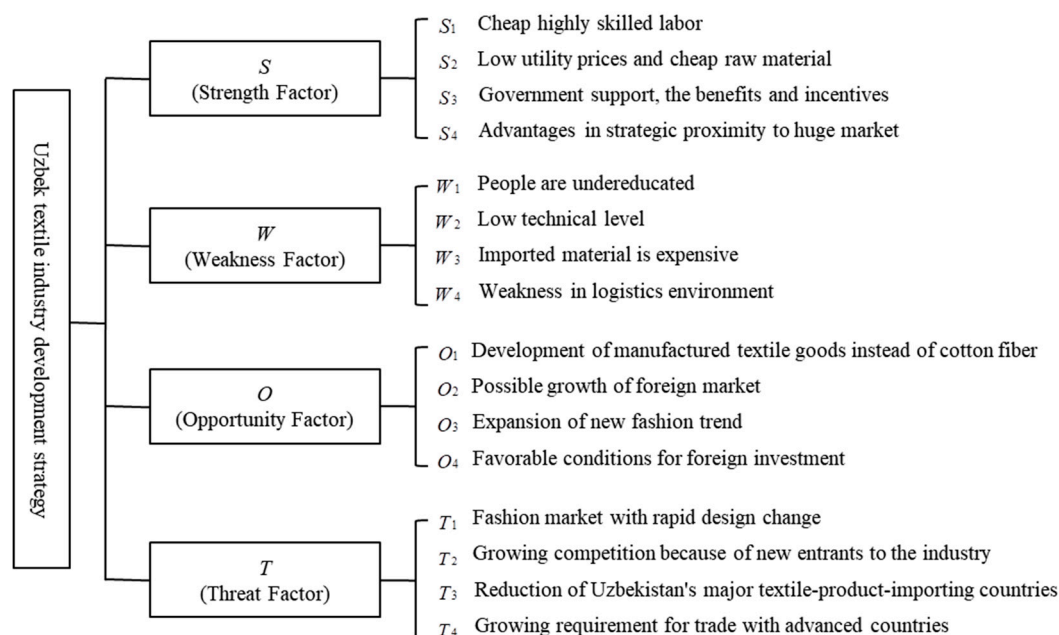


Figure 2. Hierarchy SWOT-AHP analysis model.

The questionnaire-based survey, which consisted of 30 pairwise comparison questions, was conducted for the SWOT-AHP analysis. To maintain the consistency of the survey results, we distributed 100 questionnaires to experts such as managers and executives in textile companies located in 12 regions of Uzbekistan including Tashkent, from 23 July to 25 August 2018. The textile companies were divided into three groups: foreign, joint venture, and local. Most of the survey respondents had more than 20 years of experience in the textile industry. Seventy-five of the 100 questionnaires were collected, and 73 with a consistency ratio of 0.1 or less were used for the survey analysis to maintain logical consistency. The consistency test results and the types of survey respondent companies are summarized in Tables A1 and A2 (Appendix A), while Tables 3 and 4 show the results for the distributed and returned status of questionnaires and the return status by the 12 regions, respectively.

Table 3. Distributed and returned status of questionnaires.

Section	Division	Questionnaires		
		Distribution	Returned	Used
	Total	100	75	73
Group 1	Foreign Company	20	14	14
Group 2	Joint Venture	20	15	15
Group 3	Local Company	60	46	44

Table 4. Returned status of questionnaires by 12 regions.

Region	Returned	Region	Returned
Tash-Tashkent	12	Nav-Navoi	5
Nam-Namangan	8	Sur-Surkhondarya	1
Sam-Samarkand	9	Nuk-Nukus	4
Buk-Bukhara	9	Kash-Kashkadarya	7
Anj-Andijon	2	Kho-Khorazm	8
Syr-Syrdarya	3	Jiz-Jizzakh	7

The Expert Choice 2000 program, which is considered to be the most accurate implementation of a mathematical analysis algorithm consisting of matrices and vectors of AHP analysis, was used to derive the relative priorities of each factor within the SWOT group. In the data input for pairwise comparison, the numerical mode was used among the three evaluation modes (verbal, graphical, numerical) because it is the most suitable in terms of the efficiency of inputting matrix coding data created by the survey results of this study. The distributive mode was used to calculate the weight (priority) based on the eigenvectors, because it is generally applied for weight calculation. The weights for importance analysis were calculated by dividing the L (local) weight, representing the element weight in the independent node in the SWOT, by the G (global) weight, representing the importance of the element reflecting the weight of the upper layer in the whole layering model. Table 5 shows the number of returned questionnaires for the three questionnaire groups according to the consistency ratio. Table 6 summarizes the consistency of the overall SWOT matrix and each SWOT stage for questionnaire responses with a consistency ratio of 0.1 or less.

Table 5. Number of questionnaire responses according to consistency ratio.

Section	Division	CR (Consistency Ratio)			
		Total	Under 0.1	0.1–0.2	Over 0.2
Total		75	73	1	1
Group 1	Foreign Company	14	14	0	0
Group 2	Joint Venture	15	15	0	0
Group 3	Local Company	46	44	1 (0.14)	1 (0.55)

Table 6. Results of verified consistency of integrated data.

Section	Overall	Stage 2 (4 × 4 Matrix)		Stage 3 (4 × 4 Matrix)		
Total (Integrated)	0.00	M1	M2	M3	M4	M5
		0.00	0.00	0.00	0.00	0.00
Group 1 (Foreign Company)	0.00	M1	M2	M3	M4	M5
		0.00	0.00	0.00	0.00	0.00
Group 2 (Joint Venture)	0.01	M1	M2	M3	M4	M5
		0.00	0.01	0.01	0.01	0.00
Group 3 (Local Company)	0.00	M1	M2	M3	M4	M5
		0.00	0.01	0.01	0.00	0.00

After the relative importances among the SWOT groups were evaluated, experts in Uzbekistan's textile industry evaluated the importances for the strength and weakness groups in the internal

environment attribute as 0.254 and 0.277, and the importances for the opportunities and threat groups in the external environment attribute as 0.259 and 0.209, respectively, as shown in Figure 3. In other words, we can say that Uzbekistan's textile industry experts evaluated the importances of the SWOT groups in the following order: (1) complement or reduce internal environment weaknesses; (2) take advantage of external environmental opportunities; (3) strengthen and utilize internal strengths; (4) mitigate or eliminate threats.

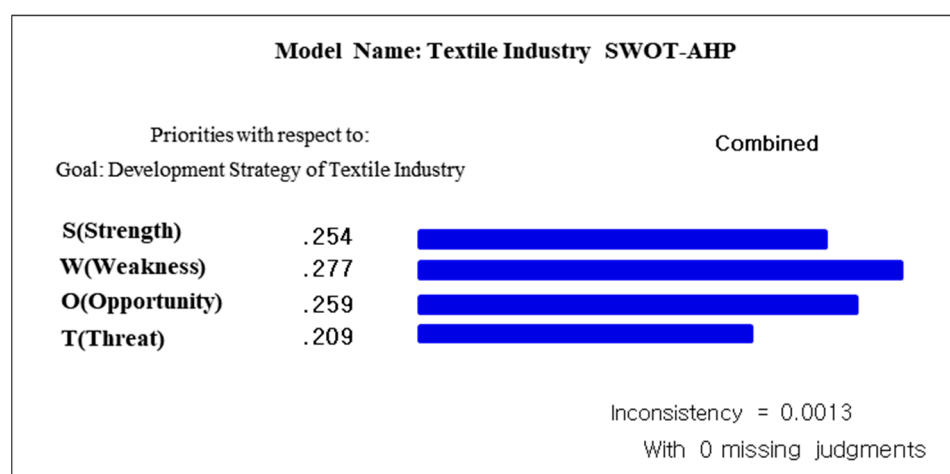


Figure 3. Relative importance for SWOT groups.

In the results for the analyses of the priorities for the relative importances (G-weights) of the SWOT factors, the W_2 (low technical level) factor of the weakness group had the highest importance at 0.12, and the S_3 (government support, benefits, and incentives) factor of the strength group and the O_4 (favorable conditions for foreign investment) factor of the opportunity group both had the second highest importance at 0.088. The S_2 (low utility prices and cheap raw material) factor of the strength group and the O_1 (development of manufactured textile goods instead of cotton fiber) factor of the opportunity group both had the third highest importance at 0.07, while the W_3 (imported material is expensive) factor and the W_1 (people are undereducated) factor of the weakness group had the fourth highest importances at 0.064 and 0.063, respectively. Finally, the T_2 (growing competition because of new entrants to the industry) factor of the threat group had the sixth highest importance. To summarize, there were three factors in the weakness group, two factors in the strength group, two factors in the opportunity group, and one factor in the threat group among the top eight factors with a significance level greater than 0.06. In the results of the analyses of the L-weights for the SWOT factors, S_3 , W_2 , O_4 , and T_2 were the most important factors in each SWOT group at 36%, 37%, 34%, and 29%, respectively. Table 7 summarizes the L-weights (priority of the factor within the group), G-weights (overall priority of the factor), and ranks for each SWOT factor.

Table 7. Weights and ranks for each SWOT factor. L—local; G—global.

Factors	L-Weight	Rank	G-Weight	Rank	Factors	L-Weight	Rank	G-Weight	Rank
S_1	0.222	3	0.057	8	W_1	0.228	3	0.063	5
S_2	0.276	2	0.070	3	W_2	0.367	1	0.102	1
S_3	0.346	1	0.088	2	W_3	0.232	2	0.064	4
S_4	0.156	4	0.040	13	W_4	0.173	4	0.048	11
O_1	0.270	2	0.070	3	T_1	0.246	2	0.051	9
O_2	0.222	3	0.058	7	T_2	0.285	1	0.060	6
O_3	0.168	4	0.044	12	T_3	0.235	3	0.049	10
O_4	0.339	1	0.088	2	T_4	0.235	3	0.049	10

4.3. Sustainable Development Strategies

The results for the L-weight and G-weight for each factor, listed in Table 7, suggest that it is necessary to complement weaknesses such as W_2 , W_3 , and W_1 , strengthen strengths such as S_3 and S_2 , utilize opportunistic factors such as O_4 and O_1 , and reduce threat factors such as T_2 . Based on the results of the SWOT-AHP analysis, we could construct sustainable strategies for the development of the textile industry in Uzbekistan by using the SO strategy for utilizing strengths and opportunities, the ST strategy for using strengths and overcoming threats, the WO strategy for complementing weaknesses and utilizing opportunities, and the WT strategy for complementing weaknesses and overcoming threats, as shown in Table 8.

Table 8. Strategic alternatives by SWOT-AHP analysis results.

	Internal Environment	S	W
		$S_1(0.057), S_2(0.070)$ $S_3(0.088), S_4(0.040)$	$W_1(0.063), W_2(0.102)$ $W_3(0.064), W_4(0.048)$
O	$O_1(0.070), O_2(0.058)$	$S_2(S_3, S_2) + O_2(O_4, O_1)$	$W_3(W_2, W_3, W_1) + O_2(O_4, O_1)$
	$O_3(0.044), O_4(0.088)$	SO Strategy	WO Strategy
T	$T_1(0.051), T_2(0.060)$	ST Strategy	WT Strategy
	$T_3(0.049), T_4(0.049)$	$S_2(S_3, S_2) + T_1(T_2)$	$W_3(W_2, W_3, W_1) + T_1(T_2)$

Table 9 shows the development strategies according to the SO, ST, WO, and WT strategy divisions. In the strength group, S_3 and S_2 had relatively high importance, and, in the opportunity group, O_4 and O_1 had relatively high importance. Therefore, it is necessary to utilize the advantages of the Uzbekistan government's policy support and incentives, as well as cheap raw materials and utilities, for the SO strategy. On the other hand, since Uzbekistan is favorable for investment by foreign companies, and the textile industry is developing from textile production to cotton textile manufacturing, it is necessary for the Uzbekistan government to establish a detailed strategy to capture opportunities for business diversification.

In the threat group, T_2 had a relatively high importance. Thus, Uzbekistan should be prepared to take advantage of the government's policy support and incentives, which are the strengths of Uzbekistan's textile industry, and to utilize cheap raw materials and utilities, while at the same time making concrete plans to prepare for competition in the textile industry due to the continuous increase of new market entrants for the ST strategy. Therefore, establishment of a strategy that can maintain competitive advantage through cost or differentiated quality and service in the textile field is essential.

In the weakness group, W_2 , W_3 , and W_1 had relatively high importance. Therefore, government policy should be emphasized to improve the low technology level, the low-income raw material, and the low education level of people for the WO strategy. As mentioned of the SO and ST strategies, it is necessary to improve the weaknesses and to face the external environmental situation with emphasis on the cotton production business mainly based on raw material cultivation. Thus, concrete and detailed diversification strategies should be developed. The Uzbekistan textile industry should actively pursue joint ventures with foreign companies wishing to make foreign direct investment (FDI) or strategic alliances in the technology sector and, through this, eliminate weaknesses, while maintaining and utilizing the opportunity factors.

Finally, the WT strategy is to complement W_2 , W_3 , and W_1 , which are the most important weakness factors, and to eliminate T_2 , which is one of the most importance threat factors. In other words, as mentioned in the WO and ST strategies, the goals should be to improve the low level of technology, the high importation of raw materials and the low education level of people, which are weak points of the Uzbekistan textile industry, and to prepare for intensifying competition within the textile industry.

Table 9. Development strategies according to strategy division.

Division	Development Strategies
SO	<ul style="list-style-type: none"> Utilizing the advantages of the Uzbek government's policy support and incentives, as well as cheap raw materials and utilities. Establishing specific strategies for business diversification in the context of the textile industry being developed from cotton-oriented to textile manufacturing.
ST	<ul style="list-style-type: none"> A strategy that can maintain competitive advantage through cost or differentiation advantage is needed. A differentiated preparation for competition in the textile industry due to new market entrants.
WO	<ul style="list-style-type: none"> Actively pursuing joint ventures with foreign companies wishing to make foreign direct investment (FDI) or strategic alliance in the technology sector, and eliminating weaknesses, while maintaining and utilizing the opportunity factors.
WT	<ul style="list-style-type: none"> Improving the low level of technology, high importation of raw materials and low education level of people, which are weak points of Uzbekistan textile industry. Preparing for intensifying competition within the textile industry.

5. Concluding Remarks

Uzbekistan's textile industry, which is a representative national industry, is pursuing sustainable development policies while constantly evolving and showing higher cotton productivity. In recent years, the Uzbekistan government promoted the development of the textile industry with abundant raw cotton and cotton yarn, as well as cheap labor and infrastructure resources (water, natural gas, electricity, etc.); Uzbekistan has a domestic market with the largest population in Central Asia, and enjoys proximity to the CIS market, which are the most important factors for the attraction of FDI. This study analyzed the importance and priorities of internal and external environmental factors for the establishment and implementation of strategies for the development of the Uzbekistan textile industry based on realistic situation perceptions. The main difference in the findings of this research from the other relevant research was in that it conducted the quantitative examination of the SWOT and provided the preferences of the decision-maker in planning and implementing the development strategies for Uzbekistan. Specifically, we took a look at the SWOT-analysis-based research that was carried out in broadly examining the textile industry in Uzbekistan. Then, a SWOT matrix for an Uzbekistan textile industry development strategy was established by integrating, classifying, and adjusting the SWOT analysis results derived from the previous studies. AHP analysis was utilized to quantify the importances and priorities of the components of the SWOT analysis. On that basis, this research provided concrete, effective, and sustainable strategy directions reflective of rational selection and prioritization within a context of limited resources. This research might be meaningful in suggesting the basis of the establishment of a viable strategy for the development of the textile industry in Uzbekistan.

Based on the results of the study, it was possible to construct strategies for the development of the Uzbekistan textile industry from a practical viewpoint. The overall strategy comprised SO strategies to utilize strengths and opportunities, ST strategies to overcome threats and complement weaknesses, WO strategies to take advantage of opportunities, and WT strategies to overcome weaknesses and avoid threats. Further AHP analysis showed that the WO strategy had the highest importance, and suggested accordingly that priority should be given to the WO strategy for the development of Uzbekistan's textile industry. Based on the SWOT-AHP analysis, we could say that the Uzbek government should pay attention to improving the low level of technology, the high price of imported raw materials, and the workers' low education level, which are the weak points of the textile industry of Uzbekistan. In addition, the Uzbek government should gradually shift the industrial structure from raw cotton to finished textile exportation, which offers relatively high added economic value. To achieve this, the

Uzbek government needs to promote joint ventures and strategic alliances with foreign companies wishing to enter the textile industry through FDI schemes.

The limitations of this study were its examination of various components of SWOT attributes through a literature review. Also, the AHP analysis limited the number of components per attribute to four, taking into account the fact that a greater number of components to be evaluated would make it more difficult to maintain logical consistency of responses. Future research will be more meaningful in analyzing the importances and priorities of the AHP and in further studying, with a structured model, the causal relationships among the key factors impacting the development of Uzbekistan's textile industry. Future research will be conducted to show how three groups (foreign company, joint venture, local company) of textile companies face difference situations and to discuss what major factors influence each group and how different geographical regions of each company have different strengths, weaknesses, opportunities, and threats.

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Appendix A

Table A1. SWOT analysis results from 2016/2017 Knowledge Sharing Program with Uzbekistan's Industry and Trade (KOTRA, 2017). CIS—Commonwealth of Independent States; USA—United States of America.

S (Strength)	W (Weakness)
<ul style="list-style-type: none"> Rich materials and cheap labor Low-cost energy sources (electricity, gas, water, etc.) Domestic consumers (30 million) and access to CIS market Duty exemption for raw materials and tax benefits Private organization implementing textile policies (Uzbekyengilsanoat) 	<ul style="list-style-type: none"> Production structure focusing on natural fibers, low production of chemical fibers Low technical level (export of cheap general-purpose articles) Weaknesses in logistics environment (duration, cost) Government-controlled, lack of cooperation among branches Lack of water and low mechanization rate in cotton industry
O (Opportunity)	T (Threat)
<ul style="list-style-type: none"> Expansion of the fast fashion trend Production with buyer compliance Possible growth of CIS market with high potentials Entry to the Eurasian Economic Community USA's regulation on Chinese export 	<ul style="list-style-type: none"> Environmental policies and CSR reinforcement in advanced countries Technical subordination by advanced countries Mid-to-low price market encroachment from China and Vietnam

Table A2. SWOT analysis results from 2009/2010 Central Asia Invest Program (2011).

S (Strength)	W (Weakness)
<ul style="list-style-type: none"> Low cost of labor Low energy cost Low water cost Availability of raw materials Tax incentives Custom incentives Cotton price benefits Proximity of a huge CIS market 	<ul style="list-style-type: none"> Restricted access to top quality cotton and high prices charged Outdated technology used for the production of cotton fiber and textiles Relatively high import dependency of readymade garments and knitted wear on raw material, interim goods, and accessories High customs duties for imported fabrics and accessories render domestic textile industry uncompetitive

Table A2. Cont.

O (Opportunity)	T (Threat)
<ul style="list-style-type: none"> Uzbekistan offers most favorable conditions to absorb foreign investments from countries-leading textile centers Growing local market Investment project support The export of manufactured textile goods instead of cotton fibers has a number of benefits Textile industry is not a capital but a labor-intensive sector, which can ease employment problems 	<ul style="list-style-type: none"> Problems of being out of step with global fashion trends Uzbekistan has a lower credit rating than its competitors Extremely low level of cooperation between Uzbekistan's banks and its textile enterprises Challenges of real competition in the global trade Lack of adequate water resources

Table A3. SWOT analysis results from 2015/2016 Knowledge Sharing Program with Uzbekistan's Industry and Trade (KDI, 2017).

S (Strength)	W (Weakness)
<ul style="list-style-type: none"> A stable source of raw materials High-quality cotton fiber Affordable resource prices including raw cotton, cheap highly skilled workforce, and low energy and utility costs Infrastructure (cotton terminals, transport, etc.) The presence of a number of large enterprises in the regions with a full cycle of production, from yarn production to finished products 	<ul style="list-style-type: none"> Dominance of primary textile production and low degree of processing raw materials Technology Lack of qualified administrative personnel and experienced managers who understand the specifics of the production process and are able to manage High import dependence on accessories, equipment spares, lubricants, and chemicals
O (Opportunity)	T (Threat)
<ul style="list-style-type: none"> The balanced reorientation of domestic raw materials exports for production of finished products with high added value The possibility of using synthetic materials Potential markets of Central Asia, Russia, Turkey, and the Baltic states The Great Silk Road The growth of labor costs in China Opportunities for foreign investors (incentives and reduction of inspection and control) A decline in cotton fiber exports and an increase in processing volume within the country are planned 	<ul style="list-style-type: none"> Potential competitors are Vietnam and Bangladesh The reduction of consumer demand in Uzbekistan's major importing countries of textile products as a result of the crisis (Russia, Kazakhstan) The high import tariffs of importing countries (except Central Asia)

Table A4. SWOT analysis results from Tursunov (2007). EU—European Union.

S (Strength)	W (Weakness)
<ul style="list-style-type: none"> Low-cost and high-quality product Government support Growing popularity of Uzbek product Already developed retail chain by many joint ventures Technological compatibility Similar requirements for quality Production cooperation, and collaboration of enterprises in the production of goods and services Long-term trade and partnership ties Well-developed scheme of forwarding and banking services Free trade regime 	<ul style="list-style-type: none"> Weak distribution chain Language barrier Existing capabilities are not enough to satisfy market demand Mentality Weak knowledge of institutional legal aspects of market access Underdeveloped stockinet manufacture for fashion market

Table A4. Cont.

O (Opportunity)	T (Threat)
<ul style="list-style-type: none"> • Growth in market demand • Growth in population income • High solvent demand 	<ul style="list-style-type: none"> • Growing competition • New entrants to the industry • Most countries themselves have well-developed production and retail systems of various clothing products • Growing technical requirements for trade (especially in EU) • Large share of transport cost • Growing competition from the countries enjoying FTA with duty-free or low-duty export • Development of substitute products • Growing competition from China, India, and Turkey • Countries may start their own manufactures • Existing free trade regime may disappear • Growth in high fashion market with rapid design change

Appendix B

Table A5. Summarized SWOT factors.

Groups	Previous Studies Factors	Final Factor of This Study
Strength	<ul style="list-style-type: none"> • Rich materials and cheap labor • Low cost of labor 	<ul style="list-style-type: none"> • Cheap and highly skilled labor cost
	<ul style="list-style-type: none"> • Low-cost energy sources • Low water cost • Affordable resource prices including raw cotton, cheap highly skilled workforce, and low energy and utility costs • Availability of raw materials • A stable source of raw materials • High-quality cotton fiber • Affordable prices • Cotton price benefits 	<ul style="list-style-type: none"> • Low utility prices and cheap raw materials
	<ul style="list-style-type: none"> • Duty exemption for raw materials and tax benefits • Tax incentives • Custom incentives • Government support 	<ul style="list-style-type: none"> • Government support, the benefits and incentives
	<ul style="list-style-type: none"> • Domestic consumers (30 million) and access to CIS market • Proximity to a huge CIS market • Growing popularity of Uzbek products 	<ul style="list-style-type: none"> • Advantages in strategic location; huge market
	<ul style="list-style-type: none"> • Well-developed forwarding and banking services schemes • Private organization implementing textile policies (Uzbekyengilsanoat) • Infrastructure (cotton terminals, transport, etc.) • The presence of a number of large enterprises in the regions with a full cycle of production, from yarn production to finished products • Already-developed retail chains by many joint ventures • Similar requirements for quality production cooperation, and collaboration of enterprises in the production of goods and services • Long-term trade and partnership ties 	<ul style="list-style-type: none"> • Others

Table A5. Cont.

Groups	Previous Studies Factors	Final Factor of This Study
Weaknesses	<ul style="list-style-type: none"> Lack of qualified administrative personnel and experienced managers who understand the specifics of the production process and are able to manage Language barrier Weak knowledge of institutional legal aspects of market Access 	<ul style="list-style-type: none"> People are undereducated
	<ul style="list-style-type: none"> Technology Outdated technology used for the production of cotton fiber and textiles Low technical level (exportation of cheap general-purpose articles) Production structure focusing on natural fibers, low production of chemical fibers Dominance of primary textile production and low degree of processing of raw materials 	<ul style="list-style-type: none"> Low technical level
	<ul style="list-style-type: none"> High import dependence on accessories, equipment spares, lubricants, and chemicals High customs duties for imported fabrics and accessories render domestic textile industry uncompetitive Relatively high import dependency of readymade garments and knitted wear on raw material, interim goods and accessories 	<ul style="list-style-type: none"> Imported materials are expensive
	<ul style="list-style-type: none"> Weaknesses in logistics environment (duration, cost) Weak distribution chain 	<ul style="list-style-type: none"> Weaknesses in logistics environment
	<ul style="list-style-type: none"> Mentality Underdeveloped stockinet manufacture for fashion market Weaknesses in logistics environment (duration, cost) Government-controlled, lack of cooperation among branches Lack of water and low mechanization rate in cotton industry Restricted access to top-quality cotton and high prices that are charged 	<ul style="list-style-type: none"> Others
Opportunity	<ul style="list-style-type: none"> The balanced reorientation of domestic raw material exports for production of finished products with high added value The exportation of manufactured textile goods instead of cotton fibers has a number of benefits A decline in cotton fiber exports and an increase in processing volume within the country are planned 	<ul style="list-style-type: none"> Development of manufactured textile goods instead of cotton fiber
	<ul style="list-style-type: none"> Potential markets of Central Asia, Russia, Turkey, and the Baltic states Possible growth of CIS market with high potentials Entry to the Eurasian Economic Community 	<ul style="list-style-type: none"> Possible growth of foreign market
	<ul style="list-style-type: none"> Expansion of new fashion trends Growth in market demand Production with buyer compliance 	<ul style="list-style-type: none"> Expansion of new fashion trend
	<ul style="list-style-type: none"> Uzbekistan offers most favorable conditions for absorption of foreign investments from leading textile centers. Investment project support Opportunities for foreign investors (incentives and reduction of inspection and control) Free trade regime 	<ul style="list-style-type: none"> Favorable conditions for foreign investments

Table A5. Cont.

Groups	Previous Studies Factors	Final Factor of This Study
Opportunity	<ul style="list-style-type: none"> High solvent demand The growth of labor costs in China Textile industry is not a capital but a labor-intensive sector, which can ease employment problems USA's regulations on Chinese exports The possibility of using synthetic materials The Great Silk Road Growing local market 	<ul style="list-style-type: none"> Others
	<ul style="list-style-type: none"> Problems of being out of step with global fashion trends Growth in high fashion market with rapid design change 	<ul style="list-style-type: none"> Fashion market with rapid design change
Threat	<ul style="list-style-type: none"> Challenges of real competition in global trade Potential competitors are Vietnam and Bangladesh Growing competition New entrants to the industry Growing competition from countries enjoying FTA with duty-free or low-duty exports Growing competition from China, India, and Turkey 	<ul style="list-style-type: none"> Growing competition because of new entrants to the industry
	<ul style="list-style-type: none"> The reduction of consumer demand in Uzbekistan's major textile-product-importing countries as a result of crisis (Russia, Kazakhstan) Most countries themselves have well-developed production and retail systems for various clothing products 	<ul style="list-style-type: none"> Reduction of Uzbekistan's major importing countries of textile products
	<ul style="list-style-type: none"> Growing technical requirements for trade (especially in EU) Environmental policies and CSR reinforcement in advanced countries Technical subordination by advanced countries 	<ul style="list-style-type: none"> Growing requirement for trade in advanced countries
	<ul style="list-style-type: none"> Mid-to-low-price market encroachment from China and Vietnam Uzbekistan has a lower credit rating than its competitors Countries may start their own manufactures Extremely low level of cooperation between Uzbekistan's banks and its textile enterprises Lack of adequate water resources Existing free trade regimes may disappear The high import tariffs of importing countries (except Central Asia) Large share of transport cost Development of substitute products 	<ul style="list-style-type: none"> Others

Appendix C

Table A6. Consistency test results by Expert Choice 2000.

Section *	Responder's Name	Overall	Stage 2		Stage 3		
			M1	M2	M3	M4	M5
1 (F)	Namatov Ravshan	0.06	0.03	0.22	0.03	0.06	0.05
2 (F)	B. Tulaganov	0.06	0.03	0.05	0.05	0.18	0.02
3 (F)	Kayumov Davron	0.00	0.00	0.00	0.00	0.00	0.00
4 (F)	Takhivodov Rafael	0.04	0.05	0.06	0.11	0.01	0.02
5 (F)	Akbarov Habibullo	0.01	0.00	0.05	0.06	0.00	0.06
6 (F)	Kastamirova Emma	0.00	0.00	0.00	0.00	0.00	0.00
7 (F)	Ismailov Nemat	0.04	0.04	0.03	0.02	0.05	0.02

Table A6. Cont.

Section *	Responder's Name	Overall	Stage 2		Stage 3		
			M1	M2	M3	M4	M5
8 (F)	Turaev Yokub	0.04	0.00	0.07	0.22	0.06	0.07
9 (F)	Vafoev Sanjar	0.06	0.04	0.12	0.08	0.12	0.06
10 (F)	Sulaymonov Ijod	0.00	0.00	0.00	0.00	0.00	0.00
11 (F)	Bobojonov Ravshan	0.07	0.07	0.10	0.05	0.08	0.04
12 (F)	Kubonov Shukhrat	0.06	0.03	0.06	0.14	0.12	0.05
13 (F)	Yakubov Zafar	0.06	0.00	0.15	0.29	0.07	0.05
14 (F)	Abdullayev Valijon	0.04	0.09	0.00	0.00	0.00	0.00
15 (J)	Kurbonov Farkhod	0.03	0.03	0.02	0.03	0.02	0.03
16 (J)	Barotov Tulkin	0.05	0.04	0.05	0.19	0.02	0.10
17 (J)	Xaitov Kobuljon	0.05	0.02	0.05	0.08	0.16	0.08
18 (J)	Mamadiev Kamolkhon	0.06	0.05	0.09	0.06	0.05	0.03
19 (J)	Tilabov Yorkin	0.05	0.05	0.05	0.15	0.05	0.00
20 (J)	Kosimov Mirsharif	0.02	0.01	0.12	0.00	0.03	0.02
21 (J)	Hashimov Nodir	0.07	0.10	0.05	0.01	0.05	0.15
22 (J)	Siddikov Mumin	0.03	0.02	0.07	0.03	0.12	0.00
23 (J)	Rustam Bofoev	0.10	0.04	0.19	0.03	0.13	0.08
24 (J)	Jalilov Shavkat	0.04	0.01	0.13	0.07	0.06	0.03
25 (J)	Khudoyber Diyeu	0.05	0.08	0.01	0.05	0.02	0.02
26 (J)	Yunuskhodjaeva R.	0.02	0.02	0.03	0.00	0.02	0.05
27 (J)	Pak Ivan	0.00	0.00	0.00	0.00	0.00	0.00
28 (J)	YulchiboevTurdali	0.06	0.07	0.11	0.03	0.04	0.02
29 (J)	Kamolov Kakhramon	0.07	0.06	0.15	0.08	0.08	0.08
30 (L)	Dadamirzaev Z. Sh	0.03	0.01	0.03	0.08	0.06	0.01
31 (L)	Soliev Ruslan	0.02	0.00	0.08	0.02	0.05	0.00
32 (L)	Abdullaev Khasan	0.09	0.00	0.14	0.08	0.19	0.21
33 (L)	Tojiev Oybek	0.03	0.02	0.07	0.05	0.02	0.02
34 (L)	Kattakulov Abdumuminov	0.07	0.04	0.10	0.09	0.09	0.01
35 (L)	Mukhtarova M.	0.02	0.01	0.01	0.03	0.03	0.03
36 (L)	Murodov Sirojiddin	0.07	0.01	0.13	0.07	0.15	0.02
37 (L)	Numonov Orif	0.09	0.00	0.23	0.23	0.10	0.07
38 (L)	Kuchkarov Ozodbek	0.03	0.02	0.06	0.02	0.07	0.03
39 (L)	Baramov Akbarkhon	0.05	0.02	0.14	0.05	0.02	0.35
40 (L)	Dadagonov Shokir	0.06	0.03	0.11	0.14	0.00	0.07
41 (L)	Riskiev Abrorbek	0.07	0.03	0.03	0.09	0.05	0.15
42 (L)	Kudratov Begzod	0.07	0.10	0.05	0.03	0.04	0.08
43 (L)	Shamsutdinov Shukhrat	0.04	0.05	0.02	0.02	0.04	0.03
44 (L)	Hashimov Abdullo	0.08	0.06	0.34	0.13	0.02	0.03
45 (L)	Farmonov Murodali	0.08	0.04	0.18	0.02	0.02	0.05
46 (L)	Isanboyev A. B.	0.10	0.08	0.06	0.23	0.02	0.08

Table A6. Cont.

Section *	Responder's Name	Overall	Stage 2		Stage 3		
			M1	M2	M3	M4	M5
47 (L)	Turaev Durbek	0.03	0.03	0.08	0.02	0.00	0.01
48 (L)	Rahmanova Malokhat	0.04	0.00	0.07	0.17	0.00	0.08
49 (L)	Yuldashev Khasankhon	0.05	0.02	0.04	0.08	0.18	0.00
50 (L)	Vakhobov B. Sh.	0.02	0.01	0.04	0.05	0.03	0.00
51 (L)	Babanov Isroil	0.04	0.00	0.08	0.05	0.07	0.18
52 (L)	Khalimov Mirshod	0.05	0.02	0.06	0.06	0.03	0.39
53 (L)	Hamamov Shukhrat	0.00	0.00	0.00	0.00	0.00	0.00
54 (L)	Jabborov Sanjar	0.06	0.02	0.12	0.00	0.06	0.06
55 (L)	Tangiboev Furkhat	0.06	0.08	0.03	0.06	0.04	0.00
56 (L)	Kholnazzrov Sh. K.	0.04	0.02	0.05	0.06	0.08	0.05
57 (L)	Azizov G'ulomjon	0.04	0.05	0.03	0.09	0.02	0.00
58 (L)	Saidmuradov B.	0.07	0.12	0.02	0.02	0.02	0.02
59 (L)	Nuraliyev Ganibek	0.06	0.02	0.08	0.13	0.09	0.11
60 (L)	Zuxurov Jahongir	0.05	0.06	0.05	0.02	0.05	0.06
61 (L)	Nazarov K. A.	0.00	0.00	0.00	0.00	0.00	0.00
62 (L)	Msharipov Egambergan	0.07	0.01	0.58	0.06	0.02	0.03
63 (L)	Suliev Kobiljon	0.55	0.62	0.72	0.81	0.02	0.04
64 (L)	Bakhodir Akhmedov	0.14	0.00	0.16	1.39	0.19	0.16
65 (L)	Buranov S. B.	0.03	0.03	0.02	0.04	0.03	0.02
66 (L)	Sadirov Otabbek	0.03	0.01	0.01	0.03	0.21	0.07
67 (L)	Z. Baratov	0.03	0.00	0.13	0.13	0.08	0.05
68 (L)	Tohirov Zohidjon	0.05	0.03	0.06	0.24	0.05	0.03
69 (L)	Safin Radik	0.03	0.02	0.03	0.05	0.05	0.00
70 (L)	Eshmirzayev Sunnatbek	0.05	0.00	0.00	1.17	0.00	0.00
71 (L)	Boltayev Komiljon	0.00	0.00	0.00	0.00	0.06	0.01
72 (L)	Ulasev Hushmurov	0.03	0.00	0.07	0.08	0.03	0.03
73 (L)	Valiyev A.	0.03	0.01	0.08	0.07	0.03	0.04
74 (L)	Amryev Azamat	0.10	0.09	0.14	0.08	0.13	0.13
75 (L)	Sokhibov Boburbek	0.01	0.00	0.02	0.00	0.01	0.00

* F: foreign company, J: joint venture, L: local company.

Table A7. The classification of textile firms in Uzbekistan.

No	Name of the Company	Manufacture
1	NarmatovRavshan: Manager of "OS BORN Textile"	All kinds of textile products
2	Dadamirzaev Z. Sh.: Manager of "TantexIplik"	Cotton yarn
3	KurbonovFarkhod: Manager of "Nafosat Textile"	Textile products
4	BarotovTulkin: Manager of "ToshbulokTeks"	Cotton yarn
5	SolievRuslan: Manager of "Nus- Man Number One Production"	Cotton fiber
6	XaitovKobuljon: Manager of "Beruniy Textile Invest"	Cotton yarn

Table A7. Cont.

No	Name of the Company	Manufacture
7	AbdullaevKhasan: Manager of “Maxim Gold Tex”	Cotton yarn
8	TojievOybek: Manager of “Jasmin Textile Plus”	Cotton yarn, textile products
9	B.Tulaganov: Manager of “Orianna Yarns Textile ”	Cotton yarn and dying
10	KattakulovAbdumuminov: Manager of “Nukus Textile”	Cotton yarn
11	KayumovDavron: Manager of “Baraka Teks”	Cotton yarn
12	MamadievKamolkhon: Manager of “Norinteks”	Cotton yarn
13	Takhivodov Rafael: Manager of “Shovot Textile”	Cotton yarn, fabric
14	Mukhtarova.M: Manager of “FartunaTextil”	Cotton fabric, yarn, dying
15	TilabovYorkin: Manager of “Forij Textile Group”	Cotton fabric
16	MurodovSirojiddin: Manager of “MurodovRahmatulla”	Cotton recycling, raw cotton
17	KosimovMirsharif: Manager of “Textiles SpektrumKolors”	Cotton fabric and dying
18	AkbarovHabibullo: Manager of “Mega Textile”	Cotton yarn
19	NumonovOrif: Manager of “Ziyokortekstil	Carpet
20	Kastamirova Emma: Manager of “ArteK International”	Cotton yarn
21	KuchkarovOzodbek: Manager of “Grand Tash Tex”	Cotton yarn, cotton fiber
22	HashimovNodir: Manager of “MedexTextil”	Cotton yarn, fiber
23	IsmailovNemat: Manager of “MRT Textile”	Cotton yarn
24	SiddikovMumin: Manager of “JizzaxKenteks”	Cotton yarn
25	BaramovAkbarxon: Manager of “Bukhara Cotton Textile”	Cotton fabric, cotton yarn
26	DadagonovShokir: Manager of “Asaka Cotton Impex”	Hydroscopic cotton
27	RiskievAbrorbek: Manager at “Nam Teks”	Cotton yarn
28	KudratovBegzod: Manager of “Osiyo Invest Mato”	Cotton yarn, ready clothes
29	ShamsutdinovShukhrat: Manager of “Samarkand BaxT Tekstil”	Textile yarn, textile fabric
30	HashimovAbdullo: Manager of “Mega Line Textile”	Ready textile products
31	FarmonovMurodali: Manager of “Murodali Farm Textile”	Unweave cotton fabric, Yarn
32	Isanboyev A.B: Manager of “JizzaxSanoatTeks”	Cotton yarn
33	TuraevYokub: Manager of “Asia Silk”	Silk products
34	VafoevSanjar: Manager of “AmudaryoTeks”	Cotton yarn
35	TuraevDurbek: Manager of “KogonNurTeks”	Cotton fabric
36	RahmanovaMalokhat: Manager of “Edem Textile”	Cotton fabric
37	YuldashevKhasankhon: Manager of “TukimachiSanoatTekstil”	Cotton fabric
38	VakhobovB.Sh: Manager of “Caravan Tex Trade”	Unweave cotton fabric
39	BabanovIsroil: Manager of “UniversalTarakiyotTekstil”	Cotton yarn
40	KhalimovMirshod: Manager of “TolalpakTekstil”	Cotton fabric
41	HamdamovShukhrat: Manager of “Sam RafoatTekstil”	Ready cotton fabric
42	JabborovSanjar: Manager of “Ok Saroytekstil”	Cotton yarn
43	SulaymonovIjod: Manager of “Doka Teks”	Cotton yarn
44	TangiboevFurkhat: Manager of “Tuytepa Textile”	Cotton yarn
45	RustamBofoev: Manager of “Azrus-Textile”	carpets

Table A7. Cont.

No	Name of the Company	Manufacture
46	Kholnazzrov.Sh.K: Manager of “Ishonch carpet”	carpets
47	AzizovG’ulomjon: Manager of “NamimpeksTekstil”	Cotton yarn
48	JalilovShavkat: Manager of “MiliGuliston Textile”	Cotton yarn
49	Saidmuradov. B: Manager of “Khiva Tex”	Cotton fabric
50	NuraliyevGanibek: Manager of “HayotbekTekstil”	Cotton yarn
51	ZuxurovJahongir: Manager of “Jizzakh Industrial Tukima”	Cotton yarn
52	Khudoyberdiyev Sobir: Manager of “Ark EkoTekstil”	Cotton yarn
53	BobojonovRavshan: Manager of “Cotton Road”	Cotton yarn, cotton fabric
54	Nazarov K. A.: Manager of “MavlyudaTextil Invest”	Ready velvet products
55	MasharipovEgambergan: Manager of “Khorazm Carpets”	Cotton yarn, carpets
56	SulievKobiljon: Manager of “Viksot-Impeks”	Cotton yarn
57	BakhodirAkhmedov: Manager of “UrganchBakhmal”	Cotton fabric
58	Yunuskhodjaeva R.: Manager of “YA Textile Group”	Cotton fabric, textile clothes
59	Pak Ivan: Manager of “SurkhonTeks”	Cotton yarn, knit fabric, satin
60	Buranov S. B.: Manager of “Baht Invest HamkorTex”	Cotton fabric
61	SadirovOtabek: Manager of “Modern Textile Industry”	Weaved cotton yarn
62	Z. Baratov: Manager of “Siyovush Textile Bukhoro”	Cotton fabric
63	KurbonovShukhrat: Manager of “Karay Textile”	Cotton yarn
64	TohirovZohidjon: Manager of “MirobodTekstil”	Cotton fabric
65	Safin Radik: Manager of “Chinoz Textile”	Cotton yarn
66	Yakubov Zafar: Manager of “ElitStandartteks”	Coarse calico
67	YulchiboevTurdali: Manager of “Marhamatteks”	Cotton yarn
68	AbdullayevValijon: Manager of “Fan Tekstil”	Cotton yarn
69	EshmirzayevSunnatbek: Manager of “Bright Navoi Textile”	Cotton yarn
70	BoltayevKomiljon: Manager of “BukhoroTexnoTeks”	Cotton fabric
71	UlashevHushmurov: Manager of “Kamashi XBK”	Cotton yarn
72	Valiyev A.: Manager of “KoboTeks”	Cotton yarn
73	KamolovKakhramon: Manager of “Jizzakh Textile”	Cotton yarn
74	Amriyev Azamat: Manager of “Uz Prom Textile”	Cotton fabric
75	SokhibovBoburbek: Manager of “KitobIpYigiruv”	Cotton yarn

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