Determination of Variables Which Affect National Competition in Textile Clothing Industry in Turkey Regarding Supply, Production and Logistic Activities

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Abstract

The effective implementation of supply chain and logistics management brings in significant advantages in terms of competition for the enterprises in recent years. With the effective management of the logistics processes, the value created in supply chain is being increased. The meaning of this value, while making profit for the service offering party, is to receive the lowest price and get the expected service in the customer side. Also, textile-garment sector is the leading sector in our country and, it has the highest employment rate among industries. This situation has increased the importance of competition and production techniques in the industry. Especially textile-garment industry presents itself as an area worth observing in this regard. The purpose of this study is to identify the variables that affect the national competition in the textile-garment industry regarding the supply, production and logistics activities. The study was conducted on the textile-garment enterprises connected to the Union of Chambers and Commodity Exchanges of Turkey (TOBB), which is active in the last quarter of 2012. In the study, competitiveness evaluated in the textile-garment industry by determining activities like supply, production and logistics. In the light of the statistical analysis some variables which determine the competition at the national level in the textile-garment industry are reached.

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1. Introduction

Nowadays developments in the world economy also affect the shape of the competition while reducing the importance of geographical boundaries and size. Turkish textile-garment enterprises must adapt these development and changes in the world market [4].

Since the 1980s, with the impact of globalization, the magnitude of competition among businesses has begun to change. Organizations tend to seek new solutions to adapt to the new competitive conditions. Since this period, there have been fast advances especially in manufacturing, procurement, management, marketing, logistics and information technology fields. One of the most important elements for businesses in adapting to this changing competitive conditions is manufacturing system and technology. Fast and desired quality respond to consumer demands, requires high level of automation and also requires the flexible production system. Generally speaking, production system has to have features like; quality, speed, flexibility and continuously developing properties for the competition [2].

It is known that logistic activities contribute greatly to the competitiveness of enterprises and have significant effect on total revenue and cost levels of businesses [5-14]. At the same time, the gross national product (GDP) is an important indicator of the [6] position of the logistics activities that constitute a significant share of the country's economy and this share increased steadily. In addition to its importance as expressed in terms of the economic system, with the added value provided to customers, it is clear that there are important contributions to the improvement of customer satisfaction. As can be seen; developments take place in the production and information technologies which let logistic activities more rationally in systematic, operational and managerial way.

Producing significant effects on the level of revenue and operating costs, and forming value added activities have brought a new dimension to the competition. At this point, the successful implementation of logistic activities is crucial in the development of the competitiveness of enterprises. In accordance with the mentioned importance, to be successful in the competition in terms of logistics activities, it is necessary to focus improving these factors [9]. Value of the products or services produced by businesses, depends on the time and place that is required by the customer. The products and services that cannot be offered in time to the customer will have no value for them [3]. Supply chain management provides a significant competitive advantage to businesses and is an important determinant of a company's business performance [8]. In today's competitive environment, it is possible by extending supply chain management application and models [12] which necessitates to move with continuous development efforts and cooperation of businesses. Supply chain management approach, transformed into a wide and integrated network, which is in parallel with the development of competitive factors and management understanding with logistics management. With this new approach, supply chain management system undertakes an integrative function in the production planning and control system applications from the time between supplying the products to distribution and delivery. The boundaries of production, planning and

control system in the supply chain management surpassed the internal business resource planning and the mentioned systems by controlling the material and information flow.

Supply, production and logistics activities that create value for the customer in terms of businesses and provide competitive advantage require continuous evaluation of these activities in a competitive platform [13]. For businesses in order to create customer value and to be permanent in the market, it is important to ensure the overall success of the production and logistics activities to be permanent in the market.

In this context, the aim of this study is to investigate the effects of procurement, production and logistic activities on national competition in the light of obtained data and the quality of applications of the procurement, production, logistic activities in the textile-garment businesses which has a great importance in nation's economy and are operational at the beginning of the information age called 21st century.

2. Materials and methods

Scanning model was used in this study. The study was made within the context of affiliated textile-garment companies that are operational in the last quarter of 2012 with the Union of Chambers and Commodity Exchanges of Turkey (TOBB). 13- Manufacturing of textile products, 14- Manufacturing of clothing are the codes in the manufacturing areas (for the clothing area the codes are 14.13.13, 14.13.14, 14.13.31, 14.13.32, 14.13.33, 14.13.34, 14.13.35 and in the textile area the codes are 13.20.20, 13.20.31, 13.20.32, 13.20.33) for textile; İstanbul, Bursa, Denizli, Tekirdağ, Uşak, Gaziantep, Adana and Kahramanmaraş provinces, for garment; İstanbul, Bursa, Ankara, Denizli, Konya, Tekirdağ, Kırklareli, İzmir, Gaziantep and Adana provinces were included in the scope of the research.

The population of this study constituted the Union of Chambers and Commodity Exchanges of Turkey (TOBB) affiliated companies operational in the 2012. The sample of this study is determinated with considering the number of the units in the population is unknown, when calculating the sample size.

In this context, the margin of error as calculated as 0,04 and the confidence level is 0,95, as the sample size n = 497. Greater numbers of surveys were made considering the sample size and as a result of dependability analysis 497 surveys were evaluated in the study.

Competition is a multi-dimensional phenomenon. In order to resolve this case, Principal Components Analysis (PCA) method which is a multivariate statistical analysis was used in the study. This method, takes into consideration of the p unit variable (specification) releated to n unit invidual (article). It makes hard to perform evaluations, because of the many variables used in the analysis that are releated to each other and the number of the variables are excessive. In such cases, the principal component analysis is the most referenced multivariate statistical analysis technique. In general, the technique using to wipe out the dependence structure between variables and/or size reduction. The explained variance of PCA variable was intended to be maximum. The first desired result with principal components analysis, for the p unit variable such as X1, X2… Xp, reduce the variables to smaller number of variables that can represent this variables and obtain the causal factors that affect the variables without a data loss. At the same time, it reveals some new structures by taking advantage of the

relations between variables [7-10].

3. Findings and comment

In this section, supply, manufacturing and logistic findings obtained from the study will be evaluated in order to determine their impact on the national competitiveness.

When we look at the demographic variables characteristics of the enterprises that participate in the study, %63 is garment, and the other part enters the classification of the textile and home textile. When we look at the total number of employees, %42 of the enterprises employ between the ages of 10 and 49, while %70 of the enterprises employ between the ages of 10 and 100. If we look at the statistics regarding the period the businesses which are operational, while the rate of businesses which are operational for 11- 25 years is 63%, those which are operational for 26- 49 years is 19%. In addition to this, %73 of the enterprises are operational in both the national and international arena.

For the supply, manufacturing and logistic activities performed by the enterprises, factor analysis that applied to evaluations they have made, are shown in the Table 2.

Since the KMO value is 0.768 > 0.50, it was revealed that the 497 units of sample size used in the study was enough for PCA. In addition, result of the Bartlett Test is $(0,000 < p < 0,01)$, shows that variables has a normal distribution. Thus, there are high correlations between variables, therefore it can be said our data set is suitable for PCA.

Table 1: KMO and Bartlett test values

KMO and Bartlett Test		
Kaiser-Meyer-Olkin		,768
Bartlett Test	Ki-square	32102,597
	sd	1485
	p	,000

When the total explained variance table shows the basic components explaining 12% of the cumulative 77,316's as the total variance. (39.021%) is the first component that has the highest explanation proportion. The variance rates explained by the second, third and forth principal components are respectively %7,085, %5,423 and %4,315. The 5. and subsequent variances of other components continues with decreasing values. The Total Explained Variance Table shows the analysis that are focused on four main components. In order to decide; scree plot graph also needs to be investigated. In this table; a break starts in the curve after the first principal component and, this break becomes evident after the fourth principal component and, the curve becomes horizontal. Therefore; (55,995%) variance rate explained by this four principal components constitute a large part of the variance explained by the 12 principal components, which is (77,316%).

4 principal components in the Table 2, is named accordingly to variables it's based on. The names of "Supply supremacy competition indicator" for the first principal component, "Manufacturing supremacy competition indicator" for the second principal component, "Logistics supremacy competition indicator" for the third principal component and "Manufacturing awareness competition indicator" for the fourth principal component are given.

Below in Table 2, connections between four basic components and the national competitiveness in the textile-garment industry explained. When the Table 2 is examined, first factor belongs to "supply". We see that the first variant of this factor is "suitability of the supply chain management" (0,728). To keep pace with the changing competitive structure, first of all; it is possible with the correct management of supply chain. Supply chain management has emerged as an organization technique to improve and make business relationships more efficient with its suppliers. The main objective at this point is to increase customer satisfaction, reduce cycle time, reduction of costs about inventory, reduce product faults and to reduce operating costs.

Supply chain management; reduces overall costs, on the other hand, focuses on management information and product/service flow throughout the chain to obtain the synchronization which allows better respond to customer requirements. It provides a fast and flexible coordination between businesses.

Cooperation among the supply chain members play a critical role in meeting consumer demand quickly. Creating long-term cooperation provide competitive advantage and cost reduction in the supply chain.

The second variable of the first factor is "supply costs" (0.721). The cost of the main and auxiliary materials has significant role for the business. Being at the minimum level of costs for these materials is required in terms of cost competitiveness. While competition in the past mainly on the price basis, competition today determines quality with the price, effective marketing, product creativity, ability to responding quickly to changing demands, product variety and investing the future.

The third variable of the first factor is "suppliers' ability to innovation, knowledge generation and leadership" (0,673). To improve their performance, businesses make innovations by way of increasing the demand and reducing the costs. The novelty of a process leading to an increase in productivity, business can acquire more profits on the market price of the product by gaining cost advantage against its competitors or, to increase market share and profits, they can take advantage on higher selling options, because of lower prices against its competitors depending on the flexibility of demand. In the product innovation, business can increase sales by gaining a competitive edge with a new product. Product innovations can either be a new product or, an improved product.

When manufacturing a new product, producing technology and information and using them effective are also important. In this context; leadership skills of the suppliers is also very important in terms of competition

Table 2: PCA Results related to performed supply, manufacturing and logistics activities

Factors	Variables	Factor Loads
First Factor		
Supply Advantage	S 30: The suitability of supply chain management	0,728
	S 28: Cost of procurement (main and sub material)	0,721
	S 29: Innovation, knowledge generation and leadership abilities of the suppliers.	0,673
	S 31: Technology used in the supply chain management	0,670
	M 32: Manufacturing technology	0,560
	S 15: Textile-clothing machine supply	0,428
	S 20: Creating a communication information system	0,421
(%) Explained Variable		*39,021*
Second Factor		
Manufacturing Advantage	M 54: Price competitiveness	0,885
	M 55: Cost competitiveness	0,851
	M 53: Level of cost	0,826
	M 52: Profitability	0,790
	M 44: Unit cost	0,692
	M 51: Market share	0,589
	M 42: Labor costs	0,479
(%) Explained Variable		*7,085*
Third Factor		
Logistics Advantage	L 8: Competence in logistics	0,881
	L 7: Customs procedures (international shipments)	0,837
	L 9: Suitability of the product distribution methods	0,763
	L 11: Safe delivery	0,633
	L 3: On-time processes	0,481
	L 5: Tracking and traceability	0,478
(%) Explained Variable		*5,423*
Fourth Factor		
Awereness in Manufacturing	M 35: To be different from the rival products.	0,808
	M 41: To be different from the rival services.	0,800
	M 36: Innovation, ability to create information	0,683
	M 40: Technologic level	0,481

(%) Explained Variable	4,315

S: Supply, M: Manufacturing, L: Logistics

Total Explained Variant: % 77,316 (releated to 12 factors)

The Variant Explained By First Four Factors: % 55,844

Factor Extraction Method: Principal Components Analysis

Rotation Method: Varimax

Another competition variable "technology used in supply chain management" (0.670) and "production technology" (0.560), are variables that interest all of the process and needed in both production and innovation points. Because; businesses are able to make innovations as a result of advancements in the technologic information level, in other words, they can be able to create new products.

Businesses may be entitled to many advantages with the usage of the technology in both supply and production. As a result of this use of technology, machine productivity increases, less space and inventory required, the amount of defective products decrease, production and delivery speed increase, there will be less machine failures and malfunctions and may be even estimated. Therefore, as a result of these gains, businesses can respond quickly to the market changes, access new markets and can improve their ability to compete. In this context, technologies they used for purposes such as, improving competitive capabilities of businesses, providing competitive advantage and making innovations are extremely important.

One of the variables of supply is "textile-garment machine supply" (0,428). While we are foreign-dependent, textile-garment machine supply have shown advancements in parallel with the developments in recent years.

As stated in the study Dalgakıran (2013), 12,8 billion dollars of general machinery exports took place according to January-October 2012 data, 255 million dollars imports took place with the %2 share received by Turkey's textile machinery import. In 2012, most of the exports take place in machines used in the woven yarn, washing, cleaning and drying of textile goods, the preparation of textile fibers, machines used in spinning, folding, and bending and auxiliary machine, device, parts and accessory. When we look at the situation around the world, we can see the total exports of the textile machinery in 2011 is 28.3 billion dollars, Turkey has #18 place in these sectors among all countries [1]. This situation contributes to the increase of competitiveness with manufacturing qualified production by relevant sector.

The last supply variable of first factor is "creating communication information system" (0,421). In the competitive conditions required by the information community, the prerequisite of maintaining business activities is to have knowledge and use in the business process. This process requires the development of knowledge-intensive business relations with the partners and uses their intellectual capital to build a network

structure. This process technology will play a key role. Taken in this context, sharing of supply process with the intrested parties will contribute to the competitiveness of enterprises.

Second factor belongs to "manufacturing". When this variable is analyzed, in the first place "price competitiveness" (0,885), second place "cost competitiveness" (0,851), third place "cost level" (0,826), fourth level "profitability" (0,790) and fifth place "unit cost" (0,692) are located. These variables are known to take decisive roles in the competition.

Showing how the profitability is distributed in this sector is important. The current situation of the textile-garment industry is the presence of a larger number of competitors in the industry which leads to a confrontation of low profit margins because of the formation of a high competition. In this case, the producers who want to turn the situation in their favour try to keep higher profit margins, by acquiring cost advantages through manufacturing in large amounts with the help of scale economies. The scale economies, represents the cost advantages obtained from companies depending on its size. Profitability in local and national business areas are more or less identical. In the international arena profit margins of some fundamental textile-garment brands are very high in Europe. The main reason of the far east rival textile-garment companies profitability is better than Turkey in terms of the cost advantages. In particular, the labor costs are much lower than Turkey. As can be seen here, costs are also an important factor that affects the competition. In particular, the utilisation of labour intensive production model by the textile and clothing industry causes the costs to increase the influence of competition. This is because labor in the textile and clothing production is to have a very large share of the overall production costs.

High fixed costs lead to very high level of minimum production quantities to save textile and garment industry's costs and, companies are forced to compete with other businesses in the same situation for products they have to sell.

Another variable is the "market share" (0,589), where the growth rate is high, businesses do not need to compete because they can easily increase their income. However, the situation changed in slow growing markets and businesses are forced to compete with each other more to increase their market share. The reason why the Textile and garment industry had reached a certain maturity, the market growth rate is very slow. Therefore, this creates an effect of increasing competition.

The latter variable factors of production is, "the labor costs" (0.479). The labor costs share of textile and garment production is high. Therefore, the increase in wages affect the competition in exports. In addition, the nature of the sector in terms of employment due to the type of labor-intensive manufacturing has become the main manufacturing arm. Textile and clothing industry in the past, by making a similar effect today in many industrialized countries, have formed the basis of industrialization and development of these countries. Unlike developed countries, Turkey's textile and garment industry having a greater capacity in terms of both raw materials and labor and domestic consumption makes this industry even more important. Another factor affecting the labor costs is the development level of the countries. Given that there are more unskilled workers in undeveloped countries, even though they have the same population and labor costs in two separate countries

will be different. While labor costs in developed countries is too high, it will be low in the undeveloped or developing countries.

In terms of both population and level of development, companies that has entry potential will be reluctant to make textile and clothing investments in Turkey, because of the high labor costs in our country compared to the Far East. Because they will have difficulties to compete with countries that has lower labor costs.

Third factor is "logistics". It is seen that the first variable belongs to this factor is "innovation in logistics" (0.881). Logistics has an effective role on competition, on product; because of the contribution of all product packaging, on place; because of the distribution of material, and on the price; because of the impact of the transaction costs. Competence in logistic services and providing quality will be shaped by embracing the importance of this role.

For the competition to become functional, it depends highly on the rationality of the company abilities and resources. Given this consideration, logistics which is a vital capability for companies has many benefits by obtaining the basic resources with best conditions for the success of the company and ensuring its management. For the sustainability of the expressed contribution, it requires improving the effectiveness by bringing the factors to the fore that affect overall success of logistics as a total process.

The second variable that belongs to logistics factor is "customs procedures (international shipments)" (0,837). The effectiveness of customs and other border procedures, show variance which depends on the efficiency of customs clearance carried out by border control agencies, speed of the formalities, simplicity and predictability. In this case, it is among the variables that affect competition. Third logistics variable is "the suitability of the product distribution method" (0,763). The structure of distribution channels also affect the current competition. A very small portion of the textile and clothing enterprises in the national industry have established their own domestic distribution channels. Whereby these businesses hold the highest domestic sales and sales profitability. Businesses at this point must establish common distribution channels by themselves and/or with another companies.

The fourth variable belongs to logistics factor is "safe delivery" (0,633) and fifth variable "process on time" (0,481). The importance of these variables evaluated in terms of scheduled time or arriving to the destination in the expected time and safe delivery. Depending on the conditions of competition increase the importance of meeting customer needs more quickly by businesses.

Customers often ask for products as quickly as possible, so the overall logistics strategy should guarantee fast deliveries. Timing also means rapid supplying of a new product, or delivering at the time specified by the customer. Power has passed to the customers with the increasing number of the businesses that can provide the products. The requirements of businesses for flexible processes for responding quickly to the changes of the products in the market has increased with the shortening of product life cycles.

Last variable that belongs to the logistics factor "tracking and traceability" (0.478) has become important in terms of traceability of shipments. Turkey's 2012 Logistics Performance Index results indicate that the

maximum rise can be experienced in the tracking and traceability of the shipments criteria [11]. In this regard, it is possible to say the mentioned criteria has a quite good performance about competition. The contributions that made by logistics activities to the competitive positions of businesses, regardless of small or big companies and factors that responsible for establishment of businesses overall success emerge as a competitive ability in terms of companies.

When the Table 2 is examined "awareness in production" can be seen as the last factor. The first variable that belongs to this factor is "different products from competitors" (0.808), and the second factor is "different services from competitors" (0,800). These two variables reveal the importance of difference in both the product and service for competition. Creating awareness and being different for competition come with being one step ahead from competitors in the same market. In this context, businesses can ensure competitive advantage with catching the difference in markets that resemble each other increasingly.

The third variable that belongs to the awareness in production factor is, "innovation, capability to creating knowledge" (0,683), and the last variable is "technological level" (0,481). With technological developments, information became important for businesses as much as the services and products they produce. Technologic strategy that will be implemented in the logistics process is identifying the contribution committed to competitive strategies followed by the company and finding a way to increase this contribution.

4. Results

Developing, changing, renewing and uninhibited world trade also continues its activity in the textile and clothing industry as in all areas. In today's world where the competition change its shape at the national level this study was aimed to determine the impact and effects on competitiveness of the factors like, especially procurement, production and logistics on businesses and obtained results from this study are shown below. The PCA results related to performed supply, production and logistics activities are first factor "supply supremacy", second factor "production supremacy", third factor "logistics supremacy" and the fourth factor "awareness in production". These variables confront us with significant impact on national competitiveness of the sector. We can see the situation which coincides substantially with the realities for Turkey and the sector when the variables examined. When we look at the characteristics of the company, we can see the variables like business operating period, area of operating, average annual capacity utilization rate and status of exporting which affects significantly the businesses' competition on the international level by means of procurement, production and logistics in the textile-garment sector.

In the textile and garment industry, Turkey has more knowledge and ability to meet the buyer's request compared to its competitors. However, in order to adapt the expected competitive environment in the near future, it has to reach the positions like a country that works about being a brand, providing faster and more efficient logistics services, technology based infrastructure with its suppliers, integrating technologies like management and engineering in production, capable of making designs, creating fashion and capable of marketing with producing cheaply. There are many strong sides of the textile and garment sector such as, high market share, bargaining power, brand recognition, continuing education, differences in the services offered to

customers, strong workforce and technological infrastructure and common store chain. In addition to these, opportunities like, increasing diversity and technological possibilities also in question.

As a result, there are many factors affecting the current competition between businesses. Providing competitive advantage in the industry depends on the quality products, using advanced technology, well-trained workforce, support for R&D, production flexibility, unique product design, rapid supply and service, on time process, competence in logistics, shortening of delivery times, tracking of shipments, speed, flexibility, using information technologies, perform strategic partnerships and using advanced technology in the production, procurement and logistics activities. These variables alone is not sufficient for competitiveness, but a combination of evaluation of the results are known to give clues about the competitive situation of the company. Competition in the existing businesses would increase today and in the future especially in the textile and garment industry, with the presence of excess capacity and oversupply in the industry, being easy to introduction of new countries and companies to textile and garment industry, being strong for the buyer companies and companies that has its own distribution channel. The textile and garment enterprises to identify competitive strategies by analyzing the conditions of competition which based on these factors would have a vital decision. In addition, the dynamic nature of Turkey's economy, technology, tastes, preferences and competitive conditions in a world of constant change, it is considered that the interpretation of this study should be treated cautiously.

5. Conclusion and Recommendations

In globalization one of the most important emerging developments is the increasing competition phenomenon. Globalization changed the shape and intensity of the competition domestically and at the same time in international arena. In global economy to be able to increase national and international competitive force there are necessary precautions to be taken in sectoral and governmental level. In this respect, first firms take precations to increase competitive power and need to apply them. In this context, some recommendations were put forward. These are:

-Logistic physical infrastructure and Logistic villages should be established inside village perimetres or in appropriate places. Custom clearance must be simplified. Arrangements must be made in relation to transportation regulations. Logistics firms must place more emphasis on management information systems to increase performance in both domestic and international arena. Information Technologies and programs must be used for the stability of logistic infrastructure. The opportunity of the usage of rail and sea transport must be increased and combined transportation must be supported and developed. Local firms must be encouraged to go into a partnership with foreign capital and to go global.

-As close cooperation with the suppliers enable production and distribution flexibility, it must be accepted that it increases the competitive advantage. Textile–clothing firms must speed the transactions like ordering, information exchange, delivery, logistics, quality control, etc. with the suppliers by using especially computer assisted techniques and at some instances transactions must be more rational by making the decisions which were made by people more automated. By creating international supply chain, firms able to supply raw

materials and low added value operations from the countries with strong scale economies. The cooperation areas with the suppliers must be increased. Apart from the production of the textile and clothing products with high added value, quality and unique design, investments toward new products must be encouraged and research-development efforts must be concentrated on. Besides to be able ensure competitive advantage, the required product by the firms must be produced at the right time, correctly, good quality with satisfied customers, without damaging the environment, with right amount and with least amount of production cost. According to the features like size, financial strength of the firms must try to establish very important strategic relations with buyers or competitors. To be able to be in a stronger position in globalized economy we must focus on policies which will increase "competitive advantage" and see this topic as one of the main targets of economic policy.

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