

INFORMATION AND COMMUNICATION TECHNOLOGIES AS A COMPETITIVE ADVANTAGE TOOL AFTER TERMINATION OF AGREEMENT ON TEXTILES AND CLOTHING: A STUDY OF TURKISH TEXTILES AND CLOTHING INDUSTRY

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Abstract: World textiles and clothing (T&C) industry had faced a serious turning point by the end of the 2004, when the Agreement on Textiles and Clothing ended and the quotas were fully eliminated between the members of World Trade Organization. The quota elimination was in favour of countries that take advantage of low costs in textile manufacturing, but it was to the disadvantage of those that produce high quality products with high prices. This paper was conducted to determine the status Turkey, its T&C industry and factors of gaining competitive advantage – especially information and communication technology factor – in the non-quota era. For this purpose the expectations and actual changes in the business volumes of the companies were questioned, and the factors of gaining competitive advantage were discussed. In addition, the information and communication technology (ICT) tools of new economy were investigated in both utilization level and competitive advantage expectation.

Keywords: Information And Communication Technologies, Textile and Clothing Agreement, Competitive Advantage.

TEKSTİL VE KONFEKSİYON ANLAŞMASININ KALKMASINDAN SONRA BİLİŞİM TEKNOLOJİLERİNİN REKABETÇİ AVANTAJ OLARAK DEĞERLENDİRİLMESİ: TÜRK TEKSTİL VE KONFEKSİYON SEKTÖRÜNDEN BİR ÇALIŞMA.

Özet: Dünya tekstil ve konfeksiyon sektörü, Dünya Ticaret Örgütü üyesi ülkeleri arası ticareti kotalarla düzenleyen Tekstil ve Konfeksiyon Anlaşmasının (Agreement on Textiles and Clothing – ATC), 2004 sonu itibari ile yürürlükten kalkması ile çok ciddi bir dönemece girmiştir. Kotaların kalkması düşük maliyetle tekstil üretimi yapan ülkelerin çıkarlarına uygun olurken daha kaliteli ve yüksek fiyata üretim yapan ülkeleri tehdit etmiştir. Bu çalışma kotasız dönemde, Türk tekstil ve konfeksiyon sektörü hakkında bir durum tespiti yapmak ve rekabet avantaj sağlayacak faktörlere, özellikle bilişim teknolojilerine ait bilgilere ulaşmak için yapılmıştır. Bu amaçla firmaların iş hacimlerindeki gerçek değişimler ve değişim beklentileri sorgulanmış ve rekabet avantajı kazanmak için gerekli faktörler tartışılmıştır. Ek olarak bu faktörler arasında sayılan yeni ekonominin bilişim teknolojisi araçlarının hangi seviyede kullanıldığını ve bu kullanımın sağlayacağı avantaj beklentisi araştırılmıştır.

Anahtar Kelimeler: Bilişim Teknolojileri, Tekstil ve Konfeksiyon Anlaşması, Rekabetçi Avantaj.

I. INTRODUCTION

Textiles and clothing (T&C) industry has been one of the most important manufacturing industries for the countries for ages. It has become a strategic industry with its export possibilities and labour intensive structure which creates a high level of employment. In the last two decades, world T&C trade increased from \$95 billion United States Dollars (USD) in 1980 to 450 billion USD in 2004. Trade figures of T&C trade increased almost 50 billion USD in each 5 year and World Trade Organization (WTO) anticipates the trade will reach an amount of 600 billion USD in 2010 [1].

The industry is composed of a long supply chain from design to distribution. The supply chain from sourcing of raw materials to design and production to distribution and marketing is being organized as an integrated production network where the production is sliced into specialized activities and each activity is located where it can contribute the most to the value of the end product [2-4].

The common structure in this industry was that economically developed countries focused on design and marketing activities, instead of production; and the production facilities shifted towards developing countries. As Minor [5] implied, T&C accounts for more than 25% of manufacturing for at least a dozen developing

countries. This figure is more than 70% for countries like Bangladesh, Pakistan and Honduras.

The Agreement on Textiles and Clothing (ATC) expired at the end of 2004 and the quotas that limit and regulate the trade relations between the World Trade Organization (WTO) countries for decades were removed [6-8]. This has started a new era in the global textiles and clothing trade. Asian countries (especially China, India and Pakistan), which were the most restricted by quotas, were then expected to dominate the global T&C trade [3, 9]. By implication, these are the likely winners from the quota phase-out. However, with the huge amount of low waged work force and high level government subventions on the main production inputs, these countries, especially China, will drag the T&C exporting countries like Turkey into a struggle of existence. The main losers are likely to be high wage firms in the quota-restricted countries who have enjoyed protection for over 40 years. Losers will also include small developing countries located far from the major Western markets which benefited from quota-free access to those markets.

Future competitiveness in textiles and clothing will depend on marketing capabilities, technology, design and quality [10]. To achieve the goal of staying competitive, there are a number of steps to be taken. One of them is to gain a competitive edge by the utilization of new economy and its information and communication technology (ICT) tools. The new economy strategies based on ICT tools promise the companies efficiency, speed and competitive advantage in various business functions, from design to customer service [11].

Providing a wide range of applications to design, produce, market, sell and service a product, ICT tools have a slow but continuous penetration in the T&C industry. By shortening the design process and the time to market, by fastening the information flow through the long supply chain, by facilitating the tracking of the fashion trends and customer needs; the companies that invest in technologies are expected to have a competitive edge against Asian production giants.

When the ICT usage and its impacts are investigated, the E-Business Watch Report [12] provide quality information on the implementation of ICT in T&C industry in the European Union. The results show that ICT usage is not very frequent and that e-business is the most frequently used tool. The report argues that the delayed ICT adoption in this industry could be a case of a 'chicken-and-egg' dilemma: on the one hand, the crisis in textile in Europe makes companies feel that e-business is a secondary goal, as there are more pressing issues to be dealt with, whereas ICT adoption is a necessity for success and survival in times of crisis and competition against low wage economies. The European Watch supports ICT usage with investments in building business

to business portals such as www.textilebusiness.it and www.progettoic.it. The study done by Moen et. al [13] also support these findings that ICT usage among 635 Danish and Norwegian SMEs is more or less limited to marketing information search. The firms do not prefer to use ICT for especially sales activities considering face-to-face interaction as more media-rich and thus more beneficial. On the other hand, another study by Nieto and Fernandez [14] points out the importance of the Internet for market information search as well as its impact on reducing the entry barriers to international markets, which in turn encouraging the firm's international expansion. The study of Loane [15] also examines the role of the Internet in the internationalisation of a cross national sample of small entrepreneurial firms from Canada, Ireland, Australia and New Zealand and the findings are similar in such a way that the internet can be accepted as a knowledge building tool especially in the areas of marketing, distribution, business processes and market intelligence and competitor analysis.

Turkey is a major player in the international T&C trade for decades. Turkish T&C industry is regarded as a key locomotive industry, pulling the country's progress along since the 1980s. In the beginning of 1980s Turkey made big investments on T&C machinery to become a production center for textiles and clothing [16, 17]. With the help of government support on investments, proximity to the western market, large amount of unskilled work force and low value of Turkish lira against foreign currencies, Turkey enjoyed high profits, big amount of export volumes and high industrial employment rates for two decades [18]. Turkish textiles rank tenth in world trade, increasing their share from 0.6% in 1980 to 2.8% in 2002. In the clothing industry, Turkey ranks fourth in the world trade, increasing its 0.3% share in 1980 to 4% in 2002. Turkey's T&C exports reached US\$ 18,8 billion in 2005 whose 29% belongs to textiles and 71% belongs to clothing exports [19].

The facts that country depends on the industry for its big share in the total exports as well as increasing the rate of employment make it necessary to rapidly restructure the Turkish T&C industry, in line with the new competitive environment in the global marketplace. As it is stated in the recent Center for European Policy Studies (CEPS) report [20], the critical point of product differentiation is in the ability to move to more technologically advanced products as well as to quality-oriented production. This raises the question of where Turkish T&C producers will locate themselves in the global production value chain in the near future. They have to make a choice between price competitiveness in the lower value added segment of the industry and quality competitiveness through the use of technology in the higher value added segment of the industry.

As a result it is obvious that Turkey T&C industry needs new competition strategies. Some of these strategies can be compiled by Ercan [18] as follows:

- _ Create a quality brand as Italy
- _ Have their own fashion brands in the global market
- _ Establish new trade segments and produce for value added niches
- _ Design new products for high quality fashion
- _ Find new markets.

To achieve these goals following actions need to be taken;

- _ Reduce the share of subcontract production in total textile production
- _ Reduce the share of simple/ordinary products and maximize the share of medium high products in total subcontract production
- _ Sell medium-high fashion products under global Turkish brand names
- _ Initially select niche markets for the functional products
- _ Sell at a price in good match with the product quality
- _ Shift from “produce first sell later” approach to “market first produce later” approach
- _ Sell and market with global and regional brand names
- _ Establish own marketing and distribution networks abroad
- _ Utilize information technologies from design to market value added products [18, 21, 22].

Today it is clear that Turkey’s main competitive strength in the market will not be based on price. Instead, Turkish T&C producers are aware of the fact that their advantage vs. East Asian competitors will be the quality of their products, marketing abilities and proximity to the markets. For product innovation and efficient marketing activities, the new economy and its information technology tools are relatively new but valuable resource for Turkish T&C industry. After investing huge amounts of capital to machinery in 1980s, today the industry is

seeking the ways of producing, marketing and selling more efficiently as well as creating strong networks between suppliers and customers. Making ICT investments and using ICT tools to achieve this end are not impossible objectives to achieve as it was in 1990s for today’s decision makers. Kotler [23] uses the new economy term to describe the set of forces that have appeared in the last decade and created new marketing and business practices. Turban et al. [24] describes it as a new era of economy that is based on digital information technologies. The rapid entrance of the computing and communication technologies to daily and business life resulted in the flow of information and technology that encouraged new business practices and approaches in the companies and the market.

ICT are believed to increase the efficiency of labour and capital and thereby influence productivity directly. ICT innovation is driven by the demand for improved technologies in the using industries [25]. From fabric or apparel design to e-shops there are a broad range of ICT applications that are used in the T&C industry. Each set of applications has its own utilization level and return on investment. These applications, their definitions, and major benefits are listed in Table.1.

Table.1. Most Common ICT Applications in T&C Industry

Most Common ICT applications in T&C Industry	Influence on T&C Industry
E-Commerce	From the T&C industry point of view, B2C e-commerce is innovative technology and is spreading among the companies, although tangibility is the biggest issue since tangible attributes such as a garment or fabric’s texture requires human touch to decide, evaluation can be harder in online environments. The major benefits of B2B e-commerce for the T&C industry are to be found networking in the supply chain management (SCM) and logistics [26].
CAD/CAM	CAD applications help the designers to draft the design and engineer new products. The configurations, dimensions and component details are drawn on the screen so that many alternatives can be explored flexibly. In addition to this, computer controlled machines, production and assembly (CAM) systems increase the speed of manufacturing items and also help the quick shifts of the product lines to switch from production of one product to another. CAM helps companies to adapt themselves to rapid changing needs of customers [27,28]. The CAD/CAM technologies have had great impact on the product innovation processes of T&C companies. The flexibility has increased and time to market is shortened. The ideas could be visualized as finished products on the computer screen far before than the production process has started.

Table.1. Most Common ICT Applications in T&C Industry (cont.)

CRM	CRM can be defined as a management approach based on relationship marketing and ICT that enables organizations to identify, attract, and increase retention of profitable customers by managing relationships with them [29]. The term customer relationship management (CRM) is born out of the integration of relationship marketing and information technology to bring one-to-one perspective into marketing, treatment of each customer as an individual asset, and gaining profitability through building relationships with them [30].
EDI	EDI is a proprietary communication network that uses dedicated communication links to exchange business information among trade partners and requires expensive customized software [26, 28]. For the T&C industry, the current focus for EDI is to extend its communication and information system throughout the entire chain from textile production, making-up/conversion, and distribution to retailing.
ERP	ERP systems support companies to integrate all business activities and allow significant gains in process efficiency. Depending on the findings of E-business W@tch study [31], it seems like in the EU T&C industry, ERP systems are efficiently utilized by large companies.
SCM	E-business has fastened the move from traditional SCM models to new ones that built on network based collaboration. This collaboration requires the sharing of critical and timely data on the movement of goods as they flow from raw material all the way to the end user. The net effect is end-to-end supply chain optimization based on open communication between networks of trading partners [26]. A successful example of this kind of electronic supply chain integration is created by Textilebusiness.it (www.textilebusiness.it) which is an initiative supported by the Chamber of Commerce of Como, Italy, allowing its participants to take the advantage of an advanced e-business solution at low costs[32].

II. RESEARCH METHODOLOGY

The purpose of the study is twofold, exploratory and descriptive. First of all, we explore the opinions of Turkish T&C companies on quota elimination process their future expectations, what they think will create competitive advantage in this new era, and means to realize these factors. Another purpose is to describe the ICT tools utilization level of Turkish T&C companies as well as to understand the whys and why nots of these

utilization levels. Since the size of the sample was limited, non-parametric methods were utilized to explore into the data.

Data Collection and Variable Measurement: The data needed was acquired via conducting face-to-face field visits. The survey consisted of two sections. First section had two sub-sections, prepared to obtain demographic data about the company (sub-section 1), export markets, export competitors and the person whom the survey was conducted (sub-section 2). The second section questioned the firms and ICT investments of the firms. The questions measured the managers' perceptions about reasons of ICT investments, reasons for not making necessary ICT investments, adequacy of ICT investments, ICT complexity, ICT utilization level, and competitive advantage expectations. Some of the questions designed in ordinal scale which requires rank-ordering such as "list your export markets according to their volumes". The questions measuring perceptions were 5 point Likert scale.

Sample Description: The unit of analysis in this study was company owners or marketing and sales executives of Turkish T&C Companies in Bursa and Denizli which are two biggest textile producing cities in Turkey. The lists of companies are obtained form the export associations of the cities. From a total number of 1258 companies in the population, 43 agreed to participate in the study, which makes a four percent rate of response. Among the companies that the survey was conducted, 21 companies were textile companies and eight companies were clothing companies, while the rest 14 companies were both textile and clothing companies. The mean of number of employees was 284. The mean of years of operation of the companies was 19 years. The years of operation varied form 3 to 61 years and years of exporting varied from 2 to 30 years. All of the companies surveyed had internet connection, 38 of them had a web site and 37 of them had data network system.

III. RESEARCH FINDINGS

Frequencies: To understand the opinions on the adequacy and level of ICT investments, the respondents were asked if they believe their ICT investments were adequate or not. The results showed that 35% believed investments were adequate whereas 46% believed that the investments were not adequate at all. The managers were asked about their future expectations in Turkish T&C industry after the quota elimination. 74,4 % of the companies (32 companies) thought that the elimination would have a negative effect on the industry. 16% of the managers thought that the effect would be positive while the rest of them thought that the elimination would have no effect.

Friedman Two-Way Analysis of Variance by Ranks Test Results: Friedman tests were run to understand whether there were significant mean differences among the answers given to various questions to fully understand the opinions of the managers. First Friedman analysis was run to see the significant mean differences among the export markets in terms of importance. The Friedman test indicated a significant difference between the first 5 export markets with a Chi- Square of 18,029 at 0,001 significance level. Western Europe was significantly the most important market with highest mean score; 2, 17, followed by Russia, Eastern Europe, Western Europe, and the USA. The results are displayed in Table.2.

Table.2:Friedman Test for Export Markets of Turkish T&C Industry

	Mean	Mean Rank	Test Statistics(a)	
USA	3,96	3,48	N	24
Eastern Europe	3,38	3,00	Chi-Square	18,029
Western Europe	2,17	1,96	Df	4
Russia	3,21	2,83	Asymp. Sig.	,001
Asia -Middle East	3,96	3,73		
1= most important, 8=least important				

A second Friedman test was run to investigate whether there were significant mean differences in the answers managers gave to "Which step should be followed in order to gain competitive advantage after the quota elimination". The results shown in Table.3 proved significant differences between the steps to be taken to achieve competitive advantages at 0,002 significant levels. The respondents thought that forming collections by creating authentic designs is the most important factor that will create competitive advantage. It was followed by positioning Turkey as an international brand name like Italy. The ICT investments and producing high value added products had the same mean scores and rank third in position. Focusing on marketing and sales activities instead of production activities had the lowest mean score. It was worth noting that even if there was a significant difference between the steps, all of them were regarded as important in gaining competitive advantage with high mean scores.

Third and Fourth Friedman tests were applied on two question groups to see if there were significant differences among the ranking of the export competitors before and after quota elimination. The results in Table.4 and 5 indicated that China was considered as the most important competitor both before and after the quota elimination significant at 0,038 and 0,000 respectively. The ranking of the most important export competitors before the quota elimination was China, Turkish domestic competitors, Asia, Western Europe, and Eastern Europe respectively. The firms believed that their most important export competitors after the quota elimination would be China, Asia, Turkish domestic competitors, Western

Europe, and Eastern Europe. The only difference observed was the reverse ranking of Asia and Turkish domestic competitors before and after the quota elimination.

Table 3: Friedman Test for Steps to Betaken to Achieve The Competitive Advantages

	Mean	Mean Rank	Test Statistics(a)	
Government Support	3,91	4,09	N	43
Authentic Design Studies	4,58	5,40	Chi-Square	22,896
Emphasis on Marketing and Sales	3,72	3,62	Df	7
Turkey as an International Brand	4,42	4,92	Asymp. Sig.	,002
Increase the Share of Brand Production	3,98	4,10		
New Markets	4,21	4,51		
High Value Added Products	4,28	4,69	1= absolutely disagree,	
Emphasis on IT investments	4,28	4,67	5= absolutely agree	

Table 4: Friedman Test for Export Market Competitors Before Quota Elimination

	Mean	Mean Ranks	Test Statistics(a)	
Turkey (domestic competitors)	2,73	2,52	N	22
Eastern Europe	4,05	3,64	Chi-Square	10,178
Western Europe	3,77	3,27	df	4
China	2,50	2,36	Asymp. Sig.	,038
Asia (except China)	3,50	3,20		
1= most important, 7=least important				

Table.5. Friedman Test for Export Market Competitors After Quota Elimination

	Mean	Mean Ranks	Test Statistics(a)	
Turkey (domestic competitors)	3,18	2,52	N	22
Eastern Europe	4,45	3,64	Chi-Square	34,800
Western Europe	4,32	3,27	df	4
China	1,68	2,36	Asymp. Sig.	,000
Asia (except China)	2,91	3,20		
1= most important, 7=least important				

The fifth Friedman test was applied to the question "why does your company make ICT investments?" to see if there was a significant difference between the reasons for investments among the firms. The results are shown in Table.6. The results were significant at 0,000 levels. The respondents stated that the most important motive for investing in ICT is to gain

competitive advantage. The other important motives were customer needs and wants, supplier needs and wants, and competitive actions in respective order.

Table.6. Friedman Test for ICT Investment Reasons

	Mean	Mean Ranks	Test Statistics(a)	
Because my competitor does	1,63	1,78	N	43
Because of gaining competitive advantage	4,21	3,56	Chi-Square	65,388
Because my customer wants	2,72	2,58	df	3
Because my supplier wants	2,05	2,08	Asymp. Sig.	,000
1= absolutely disagree, 5= absolutely agree				

Table.7. Friedman Test for not making Necessary ICT Investments

	Mean	Mean Ranks	Test Statistics(a)	
Because my company is not big enough	2,21	2,34	N	28
Because the investment costs are very high	3,00	3,52	Chi-Square	19,146
Because the technologies are too complex to use	2,54	2,82	df	4
Because there is not enough trained employees to use ICTs	3,18	3,71	Asymp.Sig.	,001
Because there is not enough reliable ICTs suppliers	2,32	2,61		
1= absolutely disagree, 5= absolutely agree				

Table 8: Kruskal Wallis Test for Education Level and ICT Complexity

	Education Level of Executives	N	Mean Rank	Test Statistics ^{a b}	
ICT Tools Comp.	High School	6	19,50	Chi-Square	9,058
	College	17	15,41	df	2
	Graduate	5	5,40	Asymp. Sig.	,011
	Total	28	19,50		

Sixth Friedman test measured the differences between the reasons for not making the necessary ICT investments. The question was asked to those who believed that their ICT investments were not adequate enough (a total of 28 cases). The actual question was “why do you think the level of ICT investments in your

company is not enough?”. There was a significant difference between the reasons of not making enough ICT investment at significance level 0,001. The main reason, the lack of trained people that will use these technologies, had the highest mean (mean score is 3, 18). It was followed by the costs of investments, the complexity of technologies, the lack of reliable suppliers and the size of the company.

Kruskal Wallis H Test Results: The Kruskal Wallis test was applied to see if the answers of executives to the question “do you think ICT tools are too complex to use in your company?” varied according to their education level. The results showed that the executives’ thoughts about the complexity of ICT tools differed according to their education level at a 0,011significance level When the mean ranks were compared, it was seen that ICT tools were considered as complex by the high school level educated managers the most (with a rank of 19,50), and by the graduates considered the least .

*Wilcoxon Signed-Rank Test Results:*The Wilcoxon signed-rank test considers information about both the sign of the differences and the magnitude of the differences between pairs [33]. Here in this test the pairs were ranking of export market competitors before and after the quota elimination and the first Wilcoxon test was applied to investigate whether there was a difference between the rankings of the export market competitors before and after quota elimination. The results proved significant difference between the rankings of export market competitor’s importance before and after the quota elimination for Turkey, Eastern Europe, China and Asia (except China). As shown at Table.9, the quota elimination makes a significant difference about the importance of these markets. However, Western Europe, Latin America and Africa as export market competitors were not shown significant difference, which showed that their rankings as an export market competitor were remain same.

Second Wilcoxon test was applied to investigate the difference between the utilization and the expectation as competitive advantages of ICT tools. The mean graph (Figure.1) shows the gaps between the mean scores of utilization and expectation as a competitive advantage of ICT tools. The mean difference was not so high for the CAD, but for the rest of the items of ICT tools there were differences in their means. This difference was seen as significant item with the Wilcoxon test, which was shown in the Table.10. Other than the CAD, all the ICT tools’ utilization and expectation as competitive advantage were significant. The understanding from this output is actually showing that there were differences between the utilization and the expectation of ICT tools and it can be understood that although there was a belief on the advantages of the usage of the ICT tools, there were problems in utilization of such tools.

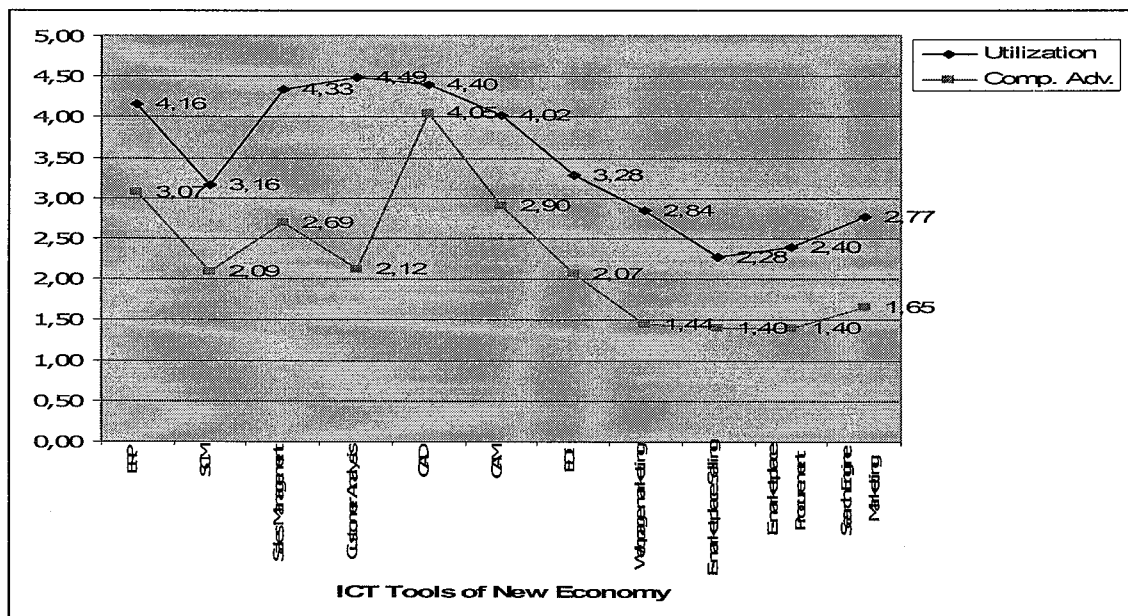


Figure.1. Means of ICT Utilization and Competitive Advantage Expectation

Table.9. Wilcoxon Test for Export Market Competitors Before and After Quota Elimination

		N	Mean Rank	Sum of Ranks	Test Statistics ^c	
Turkey (domestic competitors) before Q.E.*- Turkey (domestic competitors) after Q.E.	Negative Ranks	3	8,33	25,00	Z	-2,059 ^a
	Positive Ranks	12	7,92	95,00	Asymp. Sig. (2-tailed)	,039
	Ties	22				
	Total	37				
Eastern Europe before Q.E.- Eastern Europe after Q.E.	Negative Ranks	1	4,50	4,50	Z	-2,484 ^a
	Positive Ranks	9	5,61	50,50	Asymp. Sig. (2-tailed)	,013
	Ties	11				
	Total	21				
Western Europe before Q.E.- Western Europe after Q.E.	Negative Ranks	2	5,00	10,00	Z	-1,807 ^a
	Positive Ranks	8	5,63	45,00	Asymp. Sig. (2-tailed)	,071
	Ties	17				
	Total	27				
China before Q.E.- China after Q.E.	Negative Ranks	10	5,50	55,00	Z	-2,840 ^b
	Positive Ranks	0	,00	,00	Asymp. Sig. (2-tailed)	,005
	Ties	23				
	Total	33				
Asia (except China) before Q.E.- Asia (except China) after Q.E.	Negative Ranks	8	6,94	55,50	Z	-2,038 ^b
	Positive Ranks	3	3,50	10,50	Asymp. Sig. (2-tailed)	,042
	Ties	15				
	Total	26				
Latin America before Q.E.- Latin America after Q.E.	Negative Ranks	1	4,50	4,50	Z	-,828 ^a
	Positive Ranks	4	2,63	10,50	Asymp. Sig. (2-tailed)	,408
	Ties	14				
	Total	19				
Africa before Q.E.- Africa after Q.E.	Negative Ranks	3	2,00	6,00	Z	-1,732 ^b
	Positive Ranks	0	,00	,00	Asymp. Sig. (2-tailed)	,083
	Ties	15				
	Total	18				

a Based on negative ranks. c Wilcoxon Signed Ranks Test

b Based on positive ranks* Q.E. - Quota Elimination

Table.10. Wilcoxon Test for ICT Utilization and Competitive Advantage Expectation

		N	Mean Rank	Sum of Ranks	Test Statistics ^b	
ERP utilization – competitive advantage	Negative Ranks	6	5,17	31,00	Z	-3,567 ^a
	Positive Ranks	19	15,47	294,00	Asymp. Sig. (2-tailed)	0,000
	Ties	18				
	Total	43				
SCM utilization – competitive advantage	Negative Ranks	1	8,50	8,50	Z	-3,757 ^a
	Positive Ranks	20	11,13	222,50	Asymp. Sig. (2-tailed)	0,000
	Ties	22				
	Total	43				
Order Mng (CRM) utilization – competitive advantage	Negative Ranks	3	4,33	13,00	Z	-4,367 ^a
	Positive Ranks	25	15,72	393,00	Asymp. Sig. (2-tailed)	0,000
	Ties	15				
	Total	43				
Customer Analysis (CRM) utilization – competitive advantage	Negative Ranks	0	,00	,00	Z	-4,959 ^a
	Positive Ranks	31	16,00	496,00	Asymp. Sig. (2-tailed)	0,000
	Ties	12				
	Total	43				
CAD utilization – competitive advantage	Negative Ranks	2	5,00	10,00	Z	-1,513 ^a
	Positive Ranks	7	5,00	35,00	Asymp. Sig. (2-tailed)	0,130
	Ties	34				
	Total	43				
CAM utilization – competitive advantage	Negative Ranks	1	3,50	3,50	Z	-3,717 ^a
	Positive Ranks	18	10,36	186,50	Asymp. Sig. (2-tailed)	0,000
	Ties	23				
	Total	42				
EDI utilization – competitive advantage	Negative Ranks	3	11,83	35,50	Z	-3,591 ^a
	Positive Ranks	23	13,72	315,50	Asymp. Sig. (2-tailed)	0,000
	Ties	17				
	Total	43				
Webpabe marketing utilization – competitive advantage	Negative Ranks	0	,00	,00	Z	-4,158 ^a
	Positive Ranks	22	11,50	253,00	Asymp. Sig. (2-tailed)	0,000
	Ties	21				
	Total	43				
E-marketplace selling utilization – competitive advantage	Negative Ranks	2	10,50	21,00	Z	-3,036 ^a
	Positive Ranks	17	9,94	169,00	Asymp. Sig. (2-tailed)	0,002
	Ties	24				
	Total	43				
E-marketplace procurement utilization – competitive advantage	Negative Ranks	2	4,50	9,00	Z	-3,851 ^a
	Positive Ranks	20	12,20	244,00	Asymp. Sig. (2-tailed)	0,000
	Ties	21				
	Total	43				
Search engine marketing utilization – competitive advantage	Negative Ranks	4	8,00	32,00	Z	-3,696 ^a
	Positive Ranks	22	14,50	319,00	Asymp. Sig. (2-tailed)	0,000

a Based on negative ranks.

b Wilcoxon Signed Ranks Test

IV. CONCLUSION

World textiles and clothing (T&C) industry is been faced with the toughest challenge since the Industrial Revolution. With the elimination of the quotas, the trade balance between the world T&C exporting countries was imbalanced in favour of the Far Asian countries. This situation created a challenge for T&C exporting countries like Turkey to determine new strategies in order to have competitive advantage. The utilization of ICT tools was regarded as an important factor that could create a competitive advantage for T&C companies by increasing the speed and efficiency of internal and external business processes. Based on this expectation, this study aimed to find out how the surveyed Turkish T&C companies viewed themselves in this new era, what their competitor markets were and what could be a solution to adapt to this new environment. In this respect, the selected Turkish T&C companies evaluated their target markets, competitors and utilization level and expectation of these ICT tools as a competitive advantage.

During the site visits and interviews, it was noticed that respondents' general expectation were similar and they thought that with quota elimination, industry would be negatively affected. In other words, general tendency was that the difficult period had actually started for Turkish T&C industry after quota elimination. There were some exceptions, which is worth mentioning since it was also gathered through one-to-one interviews. Some executives were thinking that there could be some positive influences of quota elimination, since this new situation created a new challenge as to learn the importance and the need of "designing", "brand building", and "effective marketing". In the long run, having experiencing such difficulties would add new experience and knowledge to Turkish T&C industry through a learning process.

The managers evaluated "all the steps" in order to achieve competitive advantage as very important. However, the "forming of authentic collections" ranked the highest. In parallel to this, the "CAD systems" which were used for design purposes, was ranked as the most frequently used ICT tool by the surveyed firms. These outcomes were actually supporting the overall strategy of Turkey in "Positioning Turkey as a brand". Government support ranked among the least important steps to be taken to achieve the competitive advantages. The managers also explained in the interviews that that they had low expectations regarding the government contributions to the sector with exchange rates and regulations. During the discussions it was mentioned that they were still expecting something even at the minimum level, as the reduction of the costs of inputs and reduction of the taxes on the employment expenses so that they could somehow decreased their production costs. Even though making low cost production was at the bottom in

ranking of the factors of competitive advantage, most of the respondents agree or absolutely agree about the importance of it. During the interviews the managers mentioned that especially in the competition with European and local companies, price was still playing an important role. Besides the importance of price, proximity to the market and service quality were other aspects which were mentioned as very important. It was also mentioned that although it was mostly impossible for local manufacturers to catch the level of production costs of the Far-Eastern companies, their advantages were "the proximity to the market" and "the service quality".

In order to better understand the competitor markets, the respondents were asked to rank their competitor markets. In the non-quota period, Chinese and Asian companies were the leaders in the sector, which were satisfactorily affirming the results conducted by State Planning Organization (Devlet Planlama Teşkilatı-DPT) in year 2001[34]. China as having the leadership increased its importance. In addition, local companies which were second in competitors' ranking before quota elimination lost their rank to Asian companies after elimination. When the answers to the questions about the most important export markets were examined, Western Europe was considered as the most important market both in frequency and importance ranking, which were supported by the DPT report. Russia, Eastern Europe and USA were following the Western Europe respectively. It is observed that the importance of the markets decreased as the proximity to the home market decreased.

When answers to the questions related to ICT investments were evaluated, it was seen that the ICT was accepted as the third important issue among the steps to be taken to achieve competitive advantage. This showed that ICT utilization which was the main subject of this study was a general tendency for the surveyed companies since it provided competitive advantages. The basic infrastructure investments for ICT utilization are the Internet, local network connections and web sites which were present in the surveyed firms. Nevertheless, when ICT utilization and the expectation of the utilization to provide competitive advantage were compared, companies did not make necessary investments for ICT even though they believed that it would provide high level competitive advantage. The only exception was CAD systems which had both high expectation and high investment levels. For the tools other than CAD systems, the utilization levels were significantly low compared with competitive advantage expectations. The utilization of ERP and CAM systems follows CAD respectively but with high gaps. Customer focused applications as order management and customer profitability analysis applications were mostly believed to provide competitive advantage following the CAD systems. This indicated that customer relations and customer profitability were important issues for the companies in the new age.

Nevertheless all of the surveyed companies that were not using special software application for customer and order management, were still using spreadsheet applications to track their orders and some of them were also using the spreadsheets to analyze their customers. This implied a critical need of the order and customer tracking.

The managers included in this study had little interest in online sales, procurement and marketing applications to create competitive advantage to their companies. The utilization level of these online applications was also very low. The interviews indicated that there were two important reasons for this negative opinion. First reason was the tangible nature of the products, which made them unsuitable for online sales. Second reason was the risk of competitors copying the authentic designs. The design of a textile or a clothing product was the most important characteristics of it. Since this was a visual thing, it was very easy to duplicate a design once its image was copied. The surveyed companies, trying to achieve a competitive edge by creating design and collections, were not willing to share their work on the web. Related to this, surveyed companies' websites were used just signboards but not for sales and marketing purposes. In brief it was possible to say that e-commerce applications did not seem as an option for the T&C companies in this study. Even if the surveyed companies stated that they invested on ICT tools to achieve competitive advantage, reason for the low level of utilization was mainly the lack of trained staff that would use these technologies. The executives interviewed were afraid that investments would become idle because the untrained staff rejected to use the technologies. A similar study in India [35] pointed out the parallel problem related to low ICT usage as non-availability of trained manpower. Another important point was that the perception of ICT complexity which differs significantly between the education level groups of the executives within the study. As the level of education increased, managers perceived ICT as less complicated and more

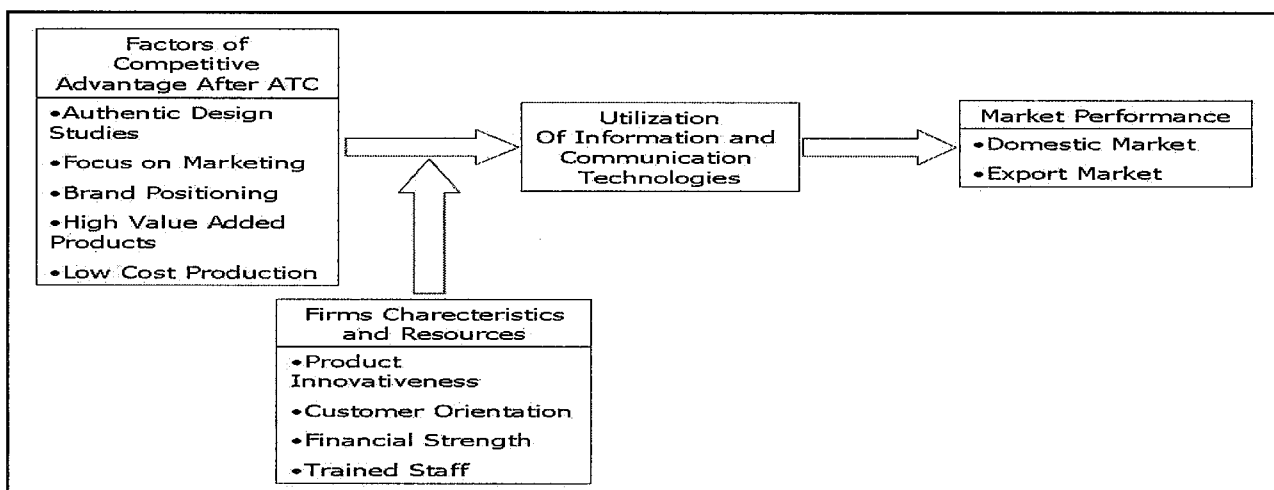
usable. Study by Tung-Chin and Chien-Chih [36] supports this finding by linking self-efficacy to ICT usage and perceived task technology fit. Final reason for low level utilization was the high cost of ICT investments especially for the technologies like ERP, SCM and EDI, again compatible with the results of Tung-Chin and Chien-Chih [36].

In conclusion, the new era in T&C trade seemed to be challenging for the Turkish T&C companies in this study. The factors to achieve competitive advantage in this new environment were actually known and agreed upon by the companies, and ICT utilization was considered as a common tool to be successful in this turbulent competition. Although the findings supported that expectation from the ICT tools were high when thinking it as a strategic tool with its competitive advantages, the utilization was not at desired level. This finding was parallel to the findings of a study on 635 Danish and Norwegian SMEs [13], which stated that ICT usage was not at a desirable level and not very much preferred especially in sales

V. IMPLICATIONS

This study implies valuable information for further academic or business studies to researchers and practitioners. The findings were actually showing the tendency of the T&C companies instead of a generalization about the industry because of the limited sample size. However the anticipations and expectations about the non-quota era and the information about the relation between ICT utilization and expectation from it as competitive advantage would provide a solid basis for the researchers who may conduct further study about this topic. The researchers could also test the following proposed model in Figure.2 by forming a random sample.

Figure.2. The Proposed Model for Further Research



This proposed model anticipates that the realization of competitive advantage factors changes the level of ICT utilization of the companies and this change in utilization effects the performance of companies' domestic and export market performance. Besides the characteristics and resources of the companies' have an effect over this relationship as moderating variable.

This research also provides valuable implications for the industry representatives and associations. The following studies can be conducted on the basis of the findings. The certification courses, trainings and apprenticeships can be arranged in association with ICT organizations to overcome the biggest obstacle, which is the lack of trained staff to use the technologies, in front of the ICT utilization. These associations can also produce and sell sector based low cost software applications to the industry to eliminate the high cost of ICT investments which is the second important obstacle in front of the ICT utilization. In order to enhance and spread the authentic design studies, the vocational high schools and colleges can open courses for textile and clothing design. The industry associations can conduct trainings and design contests to attract young and creative population.

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