

DETERMINATION OF THE KEY VARIABLES FOR FUTURE ANTICIPATION IN TURKISH APPAREL INDUSTRY

TÜRK HAZIR GIYİM SEKTÖRÜNDE GELECEK TAHMİNLEMESİ İÇİN KİLİT DEĞİŞKENLERİN BELİRLENMESİ

Canan SARICAM^{1*}, Fatma KALAOGLU¹, Seekin POLAT²

¹*Istanbul Technical University, Department of Textile Engineering, Istanbul, Turkey*

²*Istanbul Technical University, Department of Industrial Engineering, Istanbul, Turkey*

Received: 02.05.2011

Accepted: 06.02.2012

ABSTRACT

Turkish apparel industry has a significant impact on Turkish economy. But recently, there are rapid and challenging changes for the industry because of the abolishment of quotas and liberalization of trade. It is very important for the companies and for the industry to anticipate the future so that the future plans and strategies can be arranged to compete with the challenges and to gain success. Anticipation of future is extremely difficult as future involves unknowns and uncertainties in it. But, it can be forecasted to a greater extent by following a systematic forecasting process. In this context, considering the significance and the situation of the apparel industry, a PhD study is established for future anticipation of Turkish apparel industry in European market using scenario analysis. In this paper, the results of the initial step of the scenario analysis which was consisted of delimitation of the system and the structural analysis were given. The driving factors and the variables were classified into categories; MICMAC method was applied to discover the stability degree of the industry and of key variables. The results were then analyzed and reviewed within the predetermined group of variables.

Key Words: Scenario, Turkish apparel industry, European Market, MICMAC.

ÖZET

Türk hazır giyim sektörü Türkiye ekonomisi üzerinde önemli bir etkiye sahiptir. Ancak son zamanlarda, kotaların kalkması ve ticaretin serbestleşmesi sebebiyle, sektör hızlı ve mücadeleci bir değişim süreci ile karşı karşıya kalmıştır. Şirketler ve sektör için geleceğin tahminlemesinin yapılması, gelecek planları ve stratejilerin rekabet etme ve başarı etmeye uygun olarak hazırlanabilmesi açısından çok önemlidir. Gelecek tahminlemesi yapılması, geleceğin belirsizlik ve bilinmeyenleri ihtiva etmesi sebebiyle oldukça güçtür. Ancak sistematik bir tahminleme süreci izlenerek önemli ölçüde mümkündür. Bu bağlamda, hazır giyim endüstrisinin önemi ve durumu dikkate alınarak, Avrupa pazarında Türk hazır giyim sektörünün geleceğinin senaryo planlama yöntemi kullanılmak suretiyle tahminlenmesine ilişkin bir doktora çalışması başlatılmıştır. Bu makalede, söz konusu çalışmadaki senaryo analizinin ilk aşaması olan sistemin sınırlandırılması ve yapısal analiz sonuçlarına yer verilmiştir. Önemli faktör ve değişkenler kategorilere ayrılmış, MICMAC yöntemi uygulanarak sektörün durağanlık derecesi ve kilitleyici değişkenleri tespit edilmiştir. Sonuçlar, analiz edilerek önceden belirlenmiş kategoriler içinde değerlendirilmiştir.

Anahtar Kelimeler: Senaryo, Türk hazır giyim sektörü, Avrupa Pazarı, MICMAC.

* Corresponding Author: Canan Sarıcam, saricamc@itu.edu.tr, Tel. +90 212 2931300-2433 Fax. +90 212 2518829

1. INTRODUCTION

The competition in apparel industry is getting fiercer every day. Having become the second largest supplier of European market for years, Turkey began to lose its share in this market after the abolishment of quotas and because of the entrance of new countries into the market. Although these were foreseen, their consequences have just begun to show their faces and final outcome is

still difficult to guess. There are some discontinuities and unknowns for the European market. These uncertainties can have a direct influence on Turkish apparel industry. Therefore, it is very important for Turkey to correctly anticipate the future, to determine the necessary strategies and to take necessary precautions.

One of the most frequently used techniques for determination of future prospective is the scenario planning. A

scenario can be defined as a description of a possible set of events that might occur in a reasonable way and sequence (1). The purpose of scenario planning is not single point forecasting or making the probability distribution; instead scenarios can be used to bound the future events and understand the future (2). Morgan and Hunt state that scenario planning, which produces multiple scenarios in the end, enables the simultaneous

effect of particular uncertainties to be evaluated, thereby provide a rich set of actualities to be considered on which future static actions can be taken (3). The scenario method is known to have predominance in recognizing the unknown events and discontinuities (4).

There are different kinds of scenario planning methods analyzed in three schools by Bradfield which are Intuitive Logic, Probabilistic school and La Prospective schools (5). All the scenario methods rely heavily on experts' opinion. The experts should be carefully selected to conform some characteristics as Shanteau and his colleagues depicted (6, 7). Being similar in terms of dependence on experts' opinions, the methods differ regarding the usage of certain mathematical tools and probabilistic approaches. Moreover, they can interpret different levels of quantitative and qualitative data. While intuitive logic school uses more qualitative data, the prospective school, founded by Gaston Berger (8) and improved by Godet, derives numerical findings

based on prospective approach and usage of computerized tools.

Almost all those scenario methods begin with system analysis which includes identification of key decision factors, key scenario drivers or key indicators as stated by Huss and Honton (9). Specifically, the system is analyzed to cover the driving factors and key variables that affect the dynamism of the system both in present and future state in the construction of base step of Godet's scenario planning methodology. Identification of key variables and determination of the characteristics of these variables provide a good input for the scenario construction as they point out the important factors that shape the future perspective.

This paper aims to determine the key variables that have high significance for drawing the boundaries for future perspective of Turkey in European market within the time period of 10 to 15 years. The findings were established as a part of an ongoing broad PhD study entitled

"Development of Strategies for Turkish Apparel Industry Based on Scenarios" in Istanbul Technical University that was prepared under the frame of Godet's scenario methodology (10). This study focuses on the determination of the key variables, the application of structural analysis and the discussion of the results.

2. MATERIAL AND METHOD

The method used in this study is a part of scenario planning methodology of Michel Godet, a specialist about the future prospective. Godet's scenario planning methodology involves the steps (11) shown in Table 1.

The data for the structural analysis were gathered from the experts whose characteristics were given in Table 2. The experts were tried to be selected among the ones that come from different fields of study in order to expand the outcomes.

Table 1. The main steps of Godet's scenario planning method

No	Part	Explanation	Analysis	Tool
1	Construction of the base	Outline of the system and searching for the key variables	Delimitation of the system Structural analysis	MICMAC method
2		Retrospective and present situation analysis	Analysis of actors roles	MACTOR method
3	Building of scenarios	Setting of probable assumptions for the future based on key variables	Morphological analysis	SMIC method

Table 2. The characteristics of the experts

Expert	Experience (more than)	Education and Profession	Brief Information	Coincidence with the study
1	10 years	Industrial Engineer	Owens his own company as customs broker	Weaving Logistic
2	30 years	PhD, Academician	A specialist in spinning technologies	Spinning
3	10 years	PhD candidate Retail manager	The retail manager in a Turkish Retail Company Previous experience as merchandized	Retailing
4	20 years	Undergraduate Company owner	Owner of a small sized apparel company Sectoral representative	Knitting and Apparel
5	20 years	PhD Manager	Manager in a Logistic company	Logistic and foreign trade
6	20 years	Textile Engineer Foreign trade specialist	Work experience in managing Foreign Trade Department Sectoral representative	Foreign trade and knitted apparel
7	30 years	PhD, Academician	Research on competitiveness of Turkish apparel industry	Marketing
8	30 years	PhD, Company owner	Owner of a small scaled dyeing company	Dyeing
9	30 years	Undergraduate Company owner	Board member on a medium to large scaled company on woven branded apparel	Apparel Branding

As seen from Table 2, the experts included managers, academicians, company owners and sectoral representatives. It was worked with the experts individually, and four meetings were held with each expert in whole scenario planning procedure whose steps were given in Table 1. But the experts were required to review all the results after each meeting in order to allow the additional comments or suggestions doubling the number of meetings. The data used in this study came from the two meetings and two subsequent review meetings: First meeting for the identification of the variables, the following review for the approval of the whole list of variables; second meeting for the determination of the effects of each variable on the other variables and the review of the step showing the average values of the affects on the whole matrix.

The reliability and the validity of the experts and their results were evaluated by making a standard deviation based on the comparison of their abilities of discrimination capability and reaching consensus. Derived from suggestion of Shanteau's study of evaluation of the expert's reliability (7), the standard deviation of the answers of each expert to all questions and the standard deviation of the answers by all experts to each question were taken as measures of discrimination and similarity.

As depicted in Table 1, with bold fonts, this paper focused on determination of and analyzing the key variables for the future. Therefore it covered the initial step of scenario planning and it included the delimitation of the system and structural analysis as proposed by Godet.

In delimitation of the system, a complete list of all variables giving an overall vision of the system was made. These variables were determined by interviewing with the experts in a manner of brainstorming that included the questions such as ...What are the driving forces of the apparel industry?, What will be the future like?, What are uncertain?, What are the forces that will condition the future of such phenomenon?...After all the meetings were accomplished, the variables were gathered together, they were rephrased and explained with clearer meaning for delimiting the system, then the whole list of variables including their definitions were sent to the experts for their approval. At this stage, the experts didn't rank the variables instead they checked the

whole list and they proposed minor changes.

Then, the structural analysis was established on the variables. Structural analysis enables finding out the relations between these variables and determining key variables for the system considering these direct and indirect relations. In the structural analysis, the relationships between the variables are depicted in the structural matrix and MICMAC method which is a system of multiplication of matrices is applied.

For the establishment of the structural matrix, a matrix that had all the variables in rows and columns was drawn. The direct impacts of the variables in rows on the variables in columns were rated using the 0,1 scale. Based on the average of the data from the experts, MICMAC, whose principle is based on Boolean matrix, was applied on the structural matrix. In MICMAC, the powers of the structural matrix were evaluated in order to find out the indirect relations within the matrix as structural matrix had only the direct relations. Because, if A is matrix and a_{ij} is a value of one cell, then a_{ij}^2 is the cell of A_{ij}^2 matrix and if $a_{ij}^2=N$, then there are N paths of the second order length that goes from i to j via N intermediate variables. By multiplying the matrix with itself, the final variable matrix was obtained and the influence-dependency chart was drawn and analyzed by division of the chart into quartiles as proposed by Godet. The data for the structural matrix was again obtained from the experts individually, then the average values were evaluated and the final structural matrix was sent to the experts for their review.

Beside the delimitation of system and structural analysis, the results were enriched by classification of the variables. In fact, Godet proposes to classify the variables as internal and external variables. The internal variables can be identified as the variables characterizing the system whereas the external variables were the general explanatory environment of the phenomenon on its social, economical, environmental, technological and political context. That kind of classification allows better determination of the special areas of concern.

For this study, the analysis of the variables was enriched by different classification and analysis of the variables. To this aim, the variables were grouped under two different

types of categories so that, specific areas of concern can be determined. The first classification included the categories entitled with social, environmental, economical, technological and political factors which were actually the aspects that the variables were supposed to have by Godet. The second classification was made, on the other hand, based on the fact that the variables were either company specific or global. Besides, most of the variables were found to be related with marketing and therefore they were neither exactly company specific nor global. The variables related with marketing were further categorized into four categories that matched with four P's of marketing mix that were product, place, price and promotion (12). In this way, the variables were analyzed in two categories having five and six subcategories respectively.

The applied methodology and the results obtained were explained in detail in the results section including the parts of delimitation of the system, structural analysis, classification of the variables and interpretation of the findings.

3.RESULTS AND DISCUSSION

3.1.Delimitation of the system

The experts were asked to develop a list of significant variables that can affect the future of the European apparel market for Turkey during interviews. After determination of the primary variables, the second type of embedded variables were tried to be found out via interviewing with the experts in a manner of brainstorming technique. The definitions of the variables were then reviewed by the authors in order to avoid the intersections and collapses. The final list that was approved by the experts including the final variables with their definitions were given below.

1. Demographic characteristics of the target consumer: The age, gender and physical characteristics of the target consumers.
2. The economic and social characteristics of the target consumer: The purchasing power and purchasing attitudes of the consumer
3. High quality and technically improved raw material: Use of smart fibers and textiles
4. Consumption preferences: Design and style properties of the products

- with the frequency of the product launching based on the fashion cycle and climatic changes.
5. The amount of potential consumers: The size of the market and the entry time of the companies into that market
 6. The number of the rival companies and the countries in total: The degree of the competition
 7. The cost of raw materials and input: The availability and the price of textiles, fibers and chemicals
 8. Added value during production: Added value gained through production processes
 9. Product price: The money spent for the product by the consumer
 10. Geopolitical location and the choice of the production center: The production place
 11. Firm collaborations and SCM: Building trust and collaboration with the suppliers
 12. Alliances with the foreign companies and the brand acquisitions: Acquiring brands or building alliance for market penetration
 13. Production speed and flexibility: The ability to produce in smaller lots
 14. Providing services to consumer other than products: Services about sales, social responsibility and environmentally friendliness
 15. Quality and efficiency: Increasing the perceived quality for customer and decreasing the time for production
 16. Education: Professional education and experience of the workers

17. Technological infrastructure, specialization and automation: Know-how and R&D capabilities
18. Network externalities: Presentation of the complementary products and expansion of the niche market
19. Design activities: The design and style details of the products
20. Branding: Producing and selling branded products.
21. Logistic activities: Cooperation with the logistic companies and decreasing the logistic cost
22. Information technologies: Communication with the suppliers during the production and with the consumer during especially marketing level
23. Company infrastructure: Production facilities of the companies
24. Characteristics of managers and management models: Characteristics and vision of the manager and the ability of practicing strategic management tools
25. Financial properties: The capability of reaching the financial resources and credits
26. World economy: The opportunities and threats based on the dynamism in the world economy
27. International relations within the countries: The political events and governmental relations
28. Free trade agreements: The political and economical bilateral agreements
29. Administration support and bureaucracy: Governmental support and code of conduct of the companies

3.2. Application of the MICMAC Method

After establishing the list of variables, the experts were required to assess the structural matrix which had the variable list in both rows and columns using the scale of 0 and 1, where 0 means no direct influence, and 1 means a direct influence of the variable in the rows on the variables in the columns. The matrix multiplications were established using a program code written in MatLab®. That program illustrated the sum of influence and dependencies of each variable on the influence and dependency chart. The final chart obtained after multiplication steps, was shown in Figure 1.

From the Figure 1, the variables were not located homogeneously on the influence dependency chart instead, there were concentrations in lower left and upper right corners where 'The lowest influential and lowest dependent' and 'The highest influential and highest dependent' variables took place. This meant that the system or the apparel market showed both stable and unstable characters. In stable corner, mostly company specific variables took place whereas in unstable corner, the variables that belong to promotion and product P of marketing mix took place. Therefore, marketing activities were the variables that created dynamism in the system.

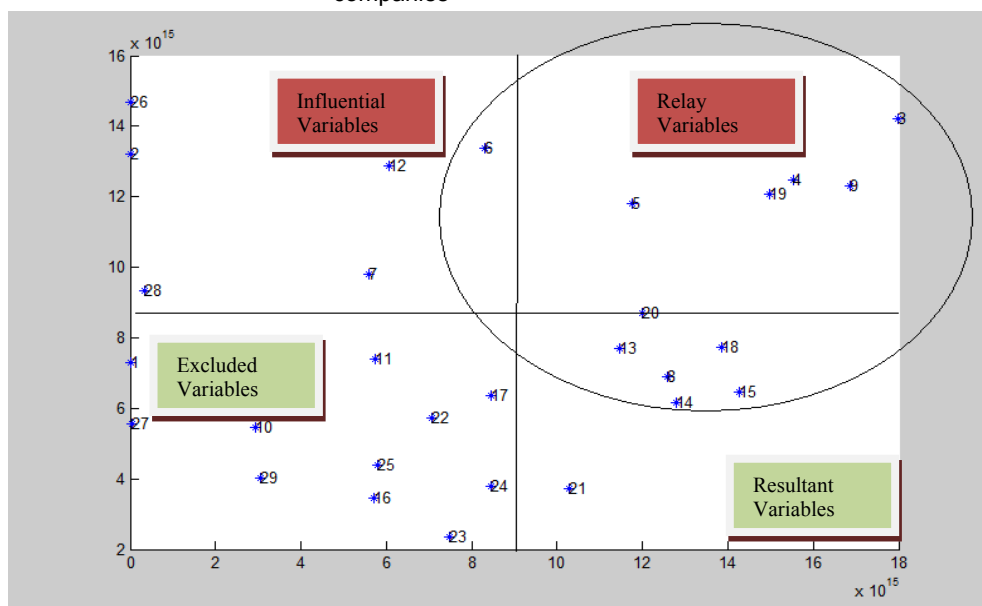


Figure 1. The influence dependency chart

The chart in Figure 1 then was divided into four equal quadrants as proposed by Godet (11) in order to group the variables according to their ability to give dynamism to the system. According to the layout, the variables were entitled with:

1. Influential variables which conditioned the rest of the system were found to be 2,6,7,12,26 and 28
2. Relay variables that were unstable in nature, were found to be 3, 4, 5, 9, 19 and 20
3. Resultant variables of highly dependent and lowly influential were found to be 8, 13, 14, 15, 18 and 21
4. Excluded variables which were had shown lowest influence and dependency that constituted the factors unconnected to the system were found to be 1, 10, 11, 16, 17, 22, 23, 24, 25, 27 and 29.

The primary key variables of the system were selected as the relay variables because of being highly influential and dependent. Nonetheless,

that region was expanded by drawing a circle and the variables taking place in that circle were also included as secondary key variables in case that no variables were ignored because of an error of drawing line dividing the table into four equal parts. Finally, the highly influential variables placed in the first quarter of the figure were selected as the 3rd group of the variables. In this way, three groups of the key variables were obtained.

3.3. Classification of Variables

As stated in the Method section, the variables were classified under two main categories. The first category involved six subcategories which were Product P, Place P, Price P and Promotion P of the marketing mix, company specific variables and global variables. The second category included the aspects of the variables which were Social, Economical, Environmental, Technological and Political. Table 3 shows the classification of the variables with the

results obtained in the structural analysis.

When the aspects of the variables were analyzed, it was seen that most of the variables had economical aspects followed by social and technological aspects. Environmental aspects, on the other hand, were got only by three variables. In the second type of categories, the variables related with promotion became the first group of variables with nine variables whereas the company specific variables became the second largest group with eight variables. The other point was that the variables in the group of promotion usually had the social and economical aspects whereas the variables in the group of company specific variables had usually got economical and technological aspects. It was observed that, the variables related with marketing mix became the primary key variables and the variables in the group of 'Global variables' became the third type of key variables showing an influential character.

Table 3. The variables regarding Product P of marketing mix

Category1	No	Category 2					Total	Type of key variable
		Soc.	Eco.	Env.	Tech.	Political		
Product P of marketing mix	3				X		4	1 st (primary) group of key variable
	8		X					Secondary group of key variable
	14	X		X	X			Secondary group of key variable
	20	X	X		X			
Place P of marketing mix	5		X				5	1 st (primary) group of key variable
	6		X					Secondary group of key variable
	10					X		
	11		X					
	21		X		X			
Price P of marketing mix	2	X	X				3	Third group of key variable
	7		X					Third group of key variable
	9		X		X			1 st (primary) group of key variable
Promotion P of marketing mix	1	X					9	
	2	X	X					Third group of key variable
	4	X	X		X			1 st (primary) group of key variable
	7		X					Third group of key variable
	12	X	X					Third group of key variable
	14	X		X	X			Secondary group of key variable
	18	X	X					Secondary group of key variable
	19	X						1 st (primary) group of key variable
	20	X	X		X			1 st (primary) group of key variable
	13	X	X		X			8
15	X	X		X		Secondary group of key variable		
16	X	X			X			
17		X		X		Secondary group of key variable		
22	X	X		X				
23		X	X	X				
24	X				X			
25		X						
Global variables	26		X			X	4	Third group of key variable
	27	X				X		
	28		X			X		Third group of key variable
	29	X			X	X		
Total		18	24	3	14	7		

*Some of the variables were seen to take place in more than one class. This was because of the equal closeness of these variables to these groups. The classification of the same variable in different groups didn't cause any problems as the further analyses were not based on this categorization.

3.4. Interpretation of the findings:

When, the MICMAC results were evaluated with the categories established in the previous stage, all the variables in the categories Product P and Price P and almost all the variables in Promotion P of marketing mix were selected as key variables. Nonetheless, it was seen that, the variables in Product P became either 1st or 2nd category of key variables whereas in Price P and Promotion P of the marketing mix, 3rd group of key variables were also observed. This meant that Price and Promotion P had more influential parameters for the market. It was interesting to see that, two variables having economical and political aspect within the group of 'Global variables' were selected as 3rd group of key variables.

Place P of marketing mix became less favored group with the group of company specific variables. This meant that, the place of production did not have much significance in the market. Therefore, the proximity to the market could no more be regarded as an advantage. Besides, the company specific variables didn't show much dynamic behavior and therefore they were not taken as special areas of concern. That's why, the activities established in company level especially did not pose an advantage as they were not influential and they could not change the other variables indeed.

Regarding the secondary classification, it was seen that almost all the variables selected as key variables included the economical aspects. Besides, it was observed that, the primary and secondary group of variables also had social and technological aspects. On the other hand, the third group of variables having the characteristics of being influential was found to have also political aspect.

Considering the classification of the variables and the results of structural analysis, the following interpretations can be made.

The future of the apparel industry is highly vulnerable to the economy and political relationships. Whereas the world economy determines the prices of goods and services in terms of raw

material and products, the political agreements and free trade between countries determine the actors in the global market, because, some countries are favored by the ease of access of goods or preserved with the rules of free trade negotiations. As the variables, "the international relations" and "Administration and bureaucracy" were not found to be influential variables, it can be said that the collaboration between the countries are much rooted on the economy instead of cultural or bureaucratic issues.

Apparel consumption market is much more driven by the technological social and economical aspects. Technological aspects included the advanced technology of the products because of usage of technological material on one hand, improved production technology on the other hand. Among the social needs, the peoples' desires of being unique and having image were loomed large in two primary key variables which were branding and design activities respectively. The major requirements of the consumers were found to be related with price. These two poles, low price and differentiated products seem to be in contradiction with one another. But considering the company specific variables, it can be thought that, the companies should find some other ways to decrease cost instead of producing low value added products. Technology is proposed as a way of decreasing the cost by increasing the quality and efficiency in operations.

The other point that came forward at the end of the analysis was environmental aspects. Although, only 2 variables among 29 had the environmental aspect, one of those variables was selected to be secondary key variable. Compared with the weight of contribution by the global variables, 2 of which were selected from 4 variables, the environmental aspects have also special concern. Therefore, that aspect should require more detailed analysis about its influence in shaping the future.

In summary, it can be said that, the global issues and economy forms a frame for the textile and apparel market in which there will be

challenges in terms of differentiation through high value added products.

4. CONCLUSIONS

The study was established as a part of a study that focuses on determining future scenarios for Turkish apparel industry in European market. In this study, the key variables were tried to be found out in order to provide an input for scenario construction. Besides, the variables were classified into categories in order to point out the important factors that shape the future perspective.

To this aim, the key variables were determined based on the experts' opinions and application of structural analysis. Delimiting the system, 29 variables were found to be driving parameters for future market. Among these variables, the variables regarding the consumer requirements were selected to be the primary key variables; the variables regarding the company level activities for the satisfaction of the consumer requirements were found to be secondary key variables and the variables regarding monetary and promotional activities and global issues were selected to highly influential third group of key variables therefore, it requires a special attention.

When a closer look into the variables were made, it was seen that the marketing activities had special area of concern in shaping the future needs of the market whereas economical issues were found to set the boundaries for those requirements. Beside the economical and social aspects, technology was found to be highly important factor for future. Finally environmental concerns loomed large than political parameters.

The findings showed that in order to be successful, the companies should much more focus on the consumer requirements regarding branding, design and producing environmentally friendly and technological products as they are most important and dynamic in nature. Beside these, the companies and generally the sector should be able to better scan the global world and political environment that can have financial ends.

REFERENCES

1. Jarke M., Bui X.T., Carrol J.M., 1998, "Scenario Management: An Interdisciplinary Approach", *Requirements Engineering*, 3, pp: 155-173.
2. Aligica P.D., 2005, "Scenarios and the growth of knowledge: Notes on epistemic element in scenario building", *Technological Forecasting and Social Change*, 72, pp: 815-824.
3. Morgan R.E., Hunt S.D., 2002, "Determining marketing strategy-A cybernetic systems approach to scenario planning", *European Journal of Marketing*, 36, 4, pp: 450-478.
4. Mietzner D., Reger G., 2005, "Advantages and disadvantages of scenario approaches for strategic foresight", *International Journal of Technology Intelligence and Planning*, 1(2), pp: 220-239.
5. Bradfield R., Wright G., Burt G., Cairns G., Van der Heijden K., 2005, "The origins and evolution of scenario techniques in long range business planning", *Futures*, 37, pp: 795-812.
6. Abdolmohammadi M.J., Shanteau J., 1992, "Personal Characteristics of expert auditors", *Organizational Behavior and Human Decision Processes*, 58, pp: 158-172.
7. Shanteau J., Weiss D.J., Thomas R.P., Pounds J.C., 2002, "Performance based assessment of expertise: How to decide if someone is an expert or not", *European Journal of Operational Research*, 136, pp: 253-263.
8. Godet M, Roubelat R., 1996, "Creating the future : The use and misuse of scenarios", *Long Range Planning*, 29(2), pp: 164-171.
9. Huss W.R., Honton E.J., 1987, Scenario planning: What styles should you use, *Long Range Planning*, 20(4), pp: 21-29.
10. Sarıcam C., 2011, "*Development of Strategies for Turkish Apparel Industry Based on Scenarios*", Unpublished PhD Dissertation, Istanbul Technical University, Institute of Science and Technology.
11. Godet M., 1994, "*From Anticipation to Action: A handbook of strategic prospective*", UNESCO Publishing.
12. Perreault W.D., McCharthy E.J., 2002, "*Basic Marketing: A Managerial Approach*", 14th ed., McGraw-Hill, Boston.