

FACTORS AFFECTING CONSUMER PREFERENCES FOR RETAIL INDUSTRY AND RETAILER SELECTION USING ANALYTIC HIERARCHY PROCESS



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A **BSTRACT** | This paper aims to identify the factors affecting consumer preferences related to shopping at organized retail store and the main and sub-criteria related with store attributes and determine the consumer preferences onto product attributes for retailer selection. To determine the consumer preferences, a questionnaire survey is carried out to 154 respondents. Factor Analysis (FA) was applied to respondents' data. The weights of consumer preferences onto store attributes are identified and an application of retailer selection has been studied using Analytic Hierarchy Process. Analytic Hierarchy Process (AHP) has been an effective tool for decision makers and researchers and is one of the most widely used multiple criteria decision-making tools when multiple criteria must be considered. For this study, a second research survey has been prepared and conducted to 218 randomly selected consumers who have shopped from selected retailers at least for three years. The results have shown that the most preferable criterion is "products' quality" on the contrary the "store personnel" criterion is insignificant for these five retailers' consumers. The paper ends by discussing other conclusions and suggests directions for future research.

Keywords: *Consumer preferences, Factor Analysis (FA), Analytic Hierarchy Process (AHP), Decision making, Retailer selection*

Jel Code: *C1*



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PERAKENDE SEKTÖRÜNDE TÜKETİCİ TERCİHLERİNE ETKİ EDEN FAKTÖRLER VE ANALİTİK HİYERARŞİ PROSESİ KULLANILARAK PERAKENDECI SEÇİMİ



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ÖZET | Bu çalışma organize olmuş perakende mağazalarından alışveriş yapan tüketicilerin tercihlerini etkileyen faktörlerin araştırılması, mağaza özellikleri ile ilgili asıl ve alt kriterlerin belirlenmesi ve perakendeci seçimi için ürün özellikleri ile ilgili tüketici tercihlerinin belirlenmesini amaçlamaktadır. Tüketici tercihlerini belirlemek amacı ile 154 katılımcıya bir anket uygulanmıştır. Katılımcılardan elde edilen verilere Faktör Analizi uygulanmış, ürün özellikleri ile ilgili tüketici tercihlerinin ağırlıkları belirlenmiş ve Analitik Hiyerarşi Prosesi kullanılarak perakendeci seçim uygulaması gerçekleştirilmiştir. Çok kriterli karar vermede Analitik Hiyerarşi Prosesi (AHP), karar verici ve araştırmacılar için etkili bir araçtır. Bu çalışma için bir araştırma anketi hazırlanmış ve en az üç yıldır bu mağazalardan alışveriş yapmakta olan rassal olarak belirlenmiş 218 tüketiciye uygulanmıştır. Sonuçlar göstermiştir ki, “ürün kalitesi” en çok tercih edilen kriter olurken “mağaza personeli” kriteri bu beş perakendecinin müşterileri arasında önemsiz bulunmuştur. Çalışma, sonuçların tartışılması ve gelecek araştırmalar için yapılan öngörülerle sonlanmaktadır.

Anahtar Kelimeler: Tüketici tercihleri, Faktör Analizi (FA), Analitik Hiyerarşi Prosesi (AHP), Karar verme, Perakendeci seçimi

Jel Kodu: C1



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1. INTRODUCTION

Globalization of retailing industry gave birth to mega-sized retailing companies within the last few decades correspondingly the rapid and continuing globalization of the world economy. In today's intensive competitive business environment, the retail industry will be more effective for the big economies because of population increasing.

Retailing entails the business activities involved in selling goods and services to consumers for their personal, family, or household use. A retailer is one who stocks the producer's goods and is involved in the act of selling it to the individual consumer, at a margin of profit. Retailing is the last stage in a distribution channel, which contains the businesses and people involved in physically moving and transferring ownership of goods and services from producer to consumer (Berman and Evans, 2009).

The retailing landscape has changed significantly during the last two decades. The retailing industry in the world has converted from the domestic market-based traditional market format of the past to large scaled franchising and establishment of brand names (Kim et al., 2012). Income, technology and lifestyles of consumers are changing, even from whom they buy are changing. The location or the place where they buy is changing; the shops are opened closed according to the convenience of the buyers. The purchasing function has gained great importance and the desires, expectations and preferences of consumers have been changing rapidly in the competitive markets due to factors such as globalization and technological change recently. Changes in technology bring new attitudes to buying products and services and to better organization of the supply chain (Londhe, 2006).

In Turkey, as in many emerging economies, there have been drastic changes in the retail industry. Although there have been many local retailers such as Migros, Kiler, Tansaş, Kipa BİM, Dia-Sa, A-101 and others, many multinational companies such as Metro, Carrefour, Real and Champion have entered Turkish market and intensified their competitive activities and developed new competitive strategies because of the market potential of our country (Kurtulus et al., 2006).

According to the official figures, Turkey was the 17th largest economy in the world with a GDP of \$613.6 billion in 2009. In 2010, Turkish GDP increased to \$737 billion, with a real growth rate of 8.9 % (DRT, Deloitte, 2011).

The estimated consumer spending level of \$6,977 in 2010 is expected to reach \$12,948 by 2014. Growth expectations have stemmed from the performance of the retail sector in 2010, which returned to pre-crisis levels, as evidenced by indicators such as retail sales and consumer spending. In 2010, 67.2% of the Turkish population was between the economically-active ages of 15-64, while 39.4% was between the ages of 20-44, which points out the immense consumption potential in Turkey. Moreover, slightly higher than 75% of the population is classified as urban (DRT, Deloitte, 2011).

In parallel with macroeconomic growth and stable economic conditions, retail sales experienced strong growth between 1998 and 2008 with a CAGR of 27.4%. Retailing saw positive market growth in 2010, as the sector returned to its 2008 levels. The \$187 billion retail sector size of 2010 is expected to reach \$250 billion by 2014. In 2010, food and non-food retail sub-sectors have totaled \$96 billion and \$91 billion, respectively. Turnover growth rates of non-food retail and ready-wear retail were strong, at 16% and 27%, respectively, compared to 11% and 18% in 2009. Additionally, Consumer Confidence Index has reached 90.99 at the end of 2010 (DRT, Deloitte, 2011).

For most developing countries, including Turkey, traditional retail formats are being replaced by supermarkets and hypermarkets. In the past, selecting their preferred retail store was not a problem for most Turkish shoppers as there were few other stores available beside traditional retail formats. However, with the expansion of modern retail outlets, consumers can choose which retail format to visit depending on various factors that they perceive as important. Consumers have to make many decisions in their lives relating to purchasing objects, products and services. The decision to purchase one product rather than another becomes more difficult as the number of alternatives under consideration increases. In this research, which factors affected consumer preferences? Consumer buying behavior is influenced by the major three factors:

- Social Factors
- Psychological Factors
- Personal Factors

Consumer preferences are the subjective tastes, as measured by utility of various bundles of goods. The individual consumer has their own set of preferences and determination of these is based upon culture, education, and individual tastes, among a plethora of other factors.

This paper aims to identify the factors affecting consumer preferences related to shopping at organized retail store and the main and sub-criteria related with store attributes and determine the consumer preferences onto product attributes for retailer selection.

2. LITERATURE REVIEW

There are many researchers who focus towards the building of consumer preferences and their attitude formation and the factors which are responsible for the same. Attitude means a learned predisposition to respond to an object in a consistently favorable or unfavorable way. It significantly plays an important role in consumer behavior. Attitudes cannot be observed directly, they are mental positions that marketers must try to infer through research measures (Wilkie, 1994: 83).

There are several papers discussing the consumer preferences (Singh and Agarwal (2012),

Verma and Khandelwal, (2011), Brand and Leonard, (2001)), store attributes (Bianchi, (2009)), AHP (Saaty, (1980), Subbaiah, (2011)), retailer selection (Liisa (1990), Mitchell and Kiral (1998), Arora (1999), Franklin (2001), Liu - Hai (2005), Philippidis and Hubbard (2003) Tzeng et al. (2002)). Retailer selection decisions are complicated by the fact that various criteria must be considered in decisions making process. The analysis of such criteria and measuring the performances of retailers have been the focus of many scientists and purchasing practitioners since the 1970's. Many papers and researches were dedicated to this problem. Especially in recent years, the topics such as competition in retailing, retailer power and retailer-manufacturer relationship are rather popular and some studies were carried out. Most of these studies were focused on groceries and nutrition products (Goffin, Szejczewski and New, 1997; Howe, 1998; Dawson, 2000).

3. RESEARCH METHODOLOGY

For identifying the consumer preferences, a questionnaire was developed on the basis of the foregoing review of the literature. The questionnaire consisted of 31 closed ended questions which were framed keeping in mind the various factors that the respondent may wish to see in a retail outlet. After demographic characteristics of respondents were asked, the indicators of consumer preferences were placed. A sample of questions in the survey is shown in figure 1.

Items of Consumer Preferences	Score
<i>Cleanliness of retail outlet is important for me.</i>	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5
<i>Layout design of retail outlet is important for me.</i>	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5
<i>Retailer outlet must have variety of products.</i>	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5
<i>Prices must be suitable for me.</i>	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5
<i>Quality of goods must be high.</i>	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5
<i>A retailer outlet must have large parking area</i>	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5
<i>Money back guarantee if any non customer satisfaction.</i>	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5
.....	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5

Figure 1. A Sample of question in the survey

The data was collected outside the major retail outlets, where the respondents were consumers who have completed their shopping in an five organized retail stores and willing to respond to the questions. Data was collected on a Likert-type of scale, where 1 stands for minimum agreement and 5 stands for maximum agreement.

The demographic characteristics for the respondents are in Table 1 given below:

Table 1: Demographic Characteristics of the Respondents

Sex	Percentage	Have Job or Not	Percentage
Male	: %38	Employed	: %71
Female	: %62	Unemployed	: %29

Income Level	Percentage
Low Income	: %14
Middle Income	: %65
High Income	: %21

Education Level	Percentage
High School	: %27
Under Graduate	: %55
Graduate	: %18

154 usable questionnaires were analyzed using SPSS 16.0. Factor analysis was carried out because FA is a multivariate statistical technique used for data reduction and summarization of a large number of variables into a smaller number of subsets or factors. The purpose of factor analysis is to simplify the data.

Descriptive statistics were utilized to calculate the mean standard error scores. An exploratory factor analysis was used to uncover the underlying factors which affect consumer preferences.

Reliability estimated using Cronbach's alpha. Coefficients of 0,79 were calculated as the minimum value.

Principle components analysis was used because the primary purpose was to identify and compute scores for the factors underlying the consumer preferences.

The initial eigenvalues showed that the first six factors explained 24%, 15%, 11%, 10%, 8%, 5% of the variance respectively. Varimax rotation was used.

The statistical analysis associated with factor analysis would produce factor loadings between each factor and each of the original variables. Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.71, above the recommended value of 0.6, and Bartlett's Test of sphericity was significant ($\chi^2 (153,0.95)=125.4 ; p<=0.05$) (Owen, 1962, Handbook of Statistics Tables, Addison Wesley Company, Renewal, 1990, Pearson).

Table 2: Results of Factor Analysis

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
V1-Quality	4,3	24,4	24,4
V2-Price	2,8	14,8	39,2
V4-Product Variety	2,2	11,4	50,6
V6-Services	1,8	10,1	60,7
V3-Location	1,5	7,8	68,5
V5-Ambiance	0,9	5,4	73,9
V8-Brand Image	0,7	4,0	77,9
V7-Personnel	0,6	3,9	81,8

Extraction Method: Principal Components | Rotation Method: Varimax

Screen plot of the analysis is given in Figure 2.

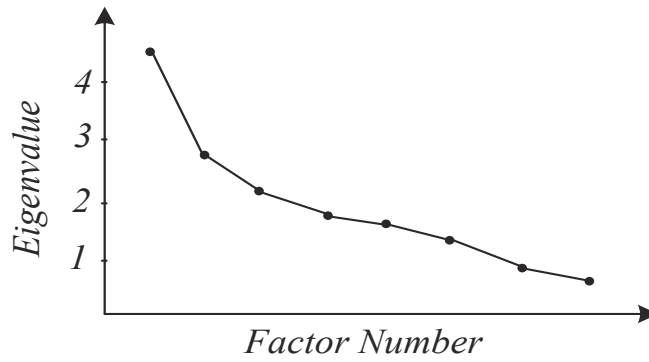


Figure 2. Scree Plot of the test

In order to allocate the retail stores effectively, priority structure of the dimensions of the consumers' is needed. Analytic Hierarch Process is used in the study to obtain the priority ratings.

The structure of research methodology is given in figure 3.

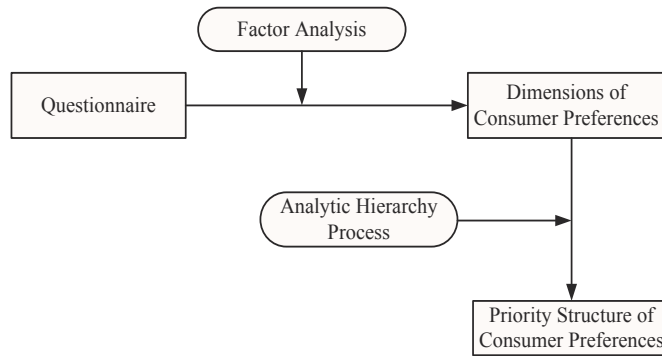


Figure 3. Research Methodology of the study

In the second stage, after finding the underlying factors which affects consumer preferences, to measure the importance of each factors (decision criterion), we have designed a survey that can quantify the relative preference level between two decision criteria. Based on the consumers' preference, the consumer can score the relative preference level between two attributes from 1 to 9, where 1 is nominally preferred and 9 is extremely preferred (Tseng and Lin, 2005, 201).

Five different retailers that have been in different locations in Istanbul were chosen. These retailers were chosen for the reason that the properties they have and different service levels they give. The firms were stated in the questionnaire with their real names, however, in our paper the firms' names were stated as A, B, C, D and E. 218 randomly selected consumers who have been shopped in all of these retailers at least three years were answered our questionnaire and 22 of these respondents not having suitable consistency ratio were not included.

We attempt to identify the main factors (criteria) hierarchically that are related to retailer selection. In the light of results of factor analysis and studies carried on retailer choice, the main criteria (factors onto store attributes) (Mitchell and Kiral, 1999, 21) are chosen. We also identified sub-criteria of each criterion. The main and sub criteria are shown in Figure 5.

In the second part of the questionnaire, the demographic properties of the respondents were asked and the main criteria were compared within. In the second section, sub components of the criteria and in the last section the five firms (according to the main criteria) were compared within. The pairwise comparisons in the questionnaire were shown as the same in Figure 4.

Comparison Pair	Evaluation Criteria						
A vs B	More Important		Magnitude				
Price Quality	<input checked="" type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> 1	<input type="checkbox"/> 3	<input type="checkbox"/> 5	<input type="checkbox"/> 7	<input type="checkbox"/> 9

Figure 4: The pairwise comparisons in the questionnaire

3. ANALYTIC HIERARCHY PROCESS

Analytic Hierarchy Process (AHP), introduced by Saaty (1980), is a systematic procedure for representing the elements of any problem hierarchically. AHP is an intuitively easy method for formulating and analyzing decisions (Saaty, 1980; Saaty, 2000). It provides a structure on decision-making processes where there are a limited numbers of choices but each has a number of attributes. AHP uses paired comparisons of objects with respect to a common goal or criteria.

AHP is relying on determining the weight score (preference score) of the factors compared within that affects the choice. Main criteria are compared within the form of paired groups. Also sub-criteria are compared within.

The response scale for the preference (Saaty, 2000; Hafeez et al., 2002) during comparing

the criteria is shown in Table 3.

Verbal Judgment or Preference Weights	Numerical Rating
Equally Preferred	1
Moderately Preferred	3
Strongly Preferred	5
Very Strongly Preferred	7
Extremely Preferred	9
Intermediate values	2, 4, 6, 8

(Nydick and Hill, 1992; Bhutta and Huq, 2002)

Based on the comparison results of these criteria for each consumer responded to the survey, we have input the scores of each consumer into a comparison matrix and calculated the geometric mean (Budescu, Zwick and Rapoport, 1986: 71; Duke & Aull-Hyde, 2002: 137) of all consumers' ratings. The same procedure was repeated for the sub-criteria.

The next step was to calculate the preference level or weight score of each decision criterion according to contribution of overall goal. Each column was totaled after pairwise comparison matrix (A) for the criteria was set up, then each element in the matrix was divided the column sum that it belongs, so normalized matrix was set up. By calculating the row means of the values in the normalized matrix (N), general weight scores of the main criteria (key factors) were found out (Table 4,5).

Table 4: Pairwise comparison matrix for the criteria

Variable	A							
	V1	V2	V3	V4	V5	V6	V7	V8
V1	1,00	1,21	2,62	1,64	2,89	2,17	3,61	3,40
V2	0,83	1,00	2,24	1,42	2,56	1,88	2,99	2,23
V3	0,38	0,45	1,00	0,57	1,46	0,70	1,75	1,91
V4	0,61	0,70	1,75	1,00	2,30	1,43	2,65	2,63
V5	0,35	0,39	0,68	0,43	1,00	0,56	1,35	2,22
V6	0,46	0,53	1,43	0,70	1,78	1,00	2,15	1,33
V7	0,28	0,33	0,57	0,38	0,74	0,47	1,00	0,98
V8	0,29	0,45	0,52	0,38	0,45	0,75	1,02	1,00
Total	4,20	5,07	10,82	6,52	13,18	8,96	16,52	15,70

Table 5: Normalized pairwise comparison matrix for the criteria

Variable	N							
	V1	V2	V3	V4	V5	V6	V7	V8
V1	0,24	0,24	0,24	0,25	0,22	0,24	0,22	0,22
V2	0,20	0,20	0,21	0,22	0,19	0,21	0,18	0,14
V3	0,09	0,09	0,09	0,09	0,11	0,08	0,11	0,12
V4	0,15	0,14	0,16	0,15	0,17	0,16	0,16	0,17
V5	0,08	0,08	0,06	0,07	0,08	0,06	0,08	0,14
V6	0,11	0,10	0,13	0,11	0,13	0,11	0,13	0,08
V7	0,07	0,06	0,05	0,06	0,06	0,05	0,06	0,06
V8	0,07	0,09	0,07	0,06	0,03	0,08	0,06	0,06
Total	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00

The results on Table 8 has shown that the weight of the first criterion “Product quality-V1” is calculated to be 0,23. It means that the first criterion is the most preferable. The second most preferable criterion is “Price-V2” with a weight score of 0,19., followed by “product variety-V4” with a weight score of 0,16. “Store personnel-V7 is the least preferable criterion. In the comparisons, some inconsistencies can be expected and accepted. When contains inconsistencies, the estimated priorities can be obtained by using the matrix as the input matrix using the eigenvalue technique where λ_{max} is the largest eigenvalue of .

Table 6: Calculation of maximum eigenvalue

Aw	1,894	1,570	0,787	1,281	0,658	0,930	0,479	0,513
w	0,23	0,19	0,10	0,16	0,08	0,11	0,06	0,07
Aw/w	8,11	8,12	8,11	8,12	8,08	8,13	8,09	8,06

$$\lambda_{max} = 8,10 \qquad CI = \frac{\lambda_{max} - n}{n - 1} = \frac{8,10 - 8}{8 - 1} = 0,015$$

$$RI = 1,41 \text{ (for } n = 8) \qquad CR = \frac{CI}{RI} = \frac{0,015}{1,41} = 0,011 < 0,1$$

If $CR \leq 0.1$, then the estimate is accepted; otherwise, a new comparison matrix is solicited until $CR \leq 0.1$ (Chang et al., 2007).

The acceptable range varies according to the size of matrix i.e. 1,11 for a 5 by 5 matrix, 1.41 for a 8 by 8 matrix and 0,1 for all larger matrices, $n \geq 5$ (Saaty, 2000; Cheng and Li, 2001).

In the continuance of the study, by utilizing the marks obtained for the five retailers in the research, we have calculated the weight scores of these retailers according to each factor (Table 7). For these calculations, procedures of AHP were used.

Table 7: Weights of the Criteria for the Retailers

Criteria	Ret A	Ret B	Ret C	Ret D	Ret E
V1-Quality	0,26	0,20	0,26	0,18	0,10
V2-Price	0,16	0,19	0,20	0,21	0,24
V3-Location	0,24	0,17	0,18	0,21	0,20
V4-Product Variety	0,26	0,20	0,26	0,17	0,11
V5-Store Ambiance	0,26	0,20	0,28	0,16	0,10
V6-Services	0,24	0,21	0,25	0,17	0,13
V7-Personnel	0,25	0,21	0,25	0,16	0,13
V8-Brand Image	0,27	0,20	0,27	0,16	0,10

After the overall weighted score matrix are formed, by multiplying the values on Table 7 with the factor scores, the column sum are found (Table 8). If all the criteria are taken into account, the column sums show the selection possibility of the retailers.

Table 8: Normal Weights of the Criteria for the Retailers

Criteria	Ret A	Ret B	Ret C	Ret D	Ret E
Quality	0,060	0,046	0,060	0,041	0,023
Price	0,030	0,036	0,038	0,040	0,046
Location	0,024	0,017	0,018	0,021	0,020
Product Variety	0,042	0,032	0,042	0,027	0,018
Store Ambiance	0,021	0,016	0,022	0,013	0,008
Services	0,026	0,023	0,028	0,019	0,014
Personnel	0,015	0,013	0,015	0,010	0,008
Brand Image	0,019	0,014	0,019	0,011	0,007
Overall Weights	0,237	0,197	0,241	0,182	0,143

4. RESULTS AND THE CONCLUSION

This paper aims to identify the factors affecting consumer preferences related to shopping at organized retail store and the main and sub-criteria related with store attributes and determine the consumer preferences onto product attributes for retailer selection.

This study also aims to check the usefulness of AHP method, which is an experimental method to find the most preferred factor for win - win growth of retailing industry in Turkey.

This study uses AHP to identify the attributes of grocery retailers (stores) that the public is demanding. Due to this research and the requirements of AHP, when the hierarchical structure of the main and sub criteria for retailer selection in Figure 2 are examined, it can be seen that the consumers attach importance gradually each selection criteria. As the criterion “products’ quality” has been the most important factor with the weight of 0,23 and the “store personnel” criterion has been the least important factor with a weight of 0,06. If one looks at the “Price” criterion on Table 9, although retailer E is the first preferable one with a weight of 0,24 , if all the

factors are taken into account, it has been seen that retailer E has been the last preferable. The values concerning retailer E has shown that being superior with respect to one factor, it cannot provide to be preferred by the consumers. The companies have to correct their present situations by determining their strong and weak aspects in the subject of preferability.

Table 9: The results of AHP (Priority of Hypermarkets)

Hyper	V1	V2	V3	V4	V5	V6	V7	V8	Priority
Markets	0,23	0,19	0,10	0,16	0,08	0,11	0,06	0,07	
E	0,10	0,24	0,20	0,11	0,10	0,13	0,13	0,10	0,143
D	0,18	0,21	0,21	0,17	0,16	0,17	0,16	0,16	0,182
C	0,26	0,20	0,18	0,26	0,28	0,25	0,25	0,27	0,241
A	0,20	0,19	0,17	0,20	0,20	0,21	0,21	0,20	0,197
B	0,26	0,16	0,24	0,26	0,26	0,24	0,25	0,27	0,237

The results of the analysis on Table 9 show that the possibility to select Retailer C is quite high with a weight of 0,241 according to the other retailers. If you look at the overall weighted score, it is expected that A, B, D, E are selected sequentially. But a consumer may want to select a retailer by evaluating only one criterion. In this situation, if a consumer gives more importance to the price criterion, he/she will select retailer E which has a weight of 0,046.

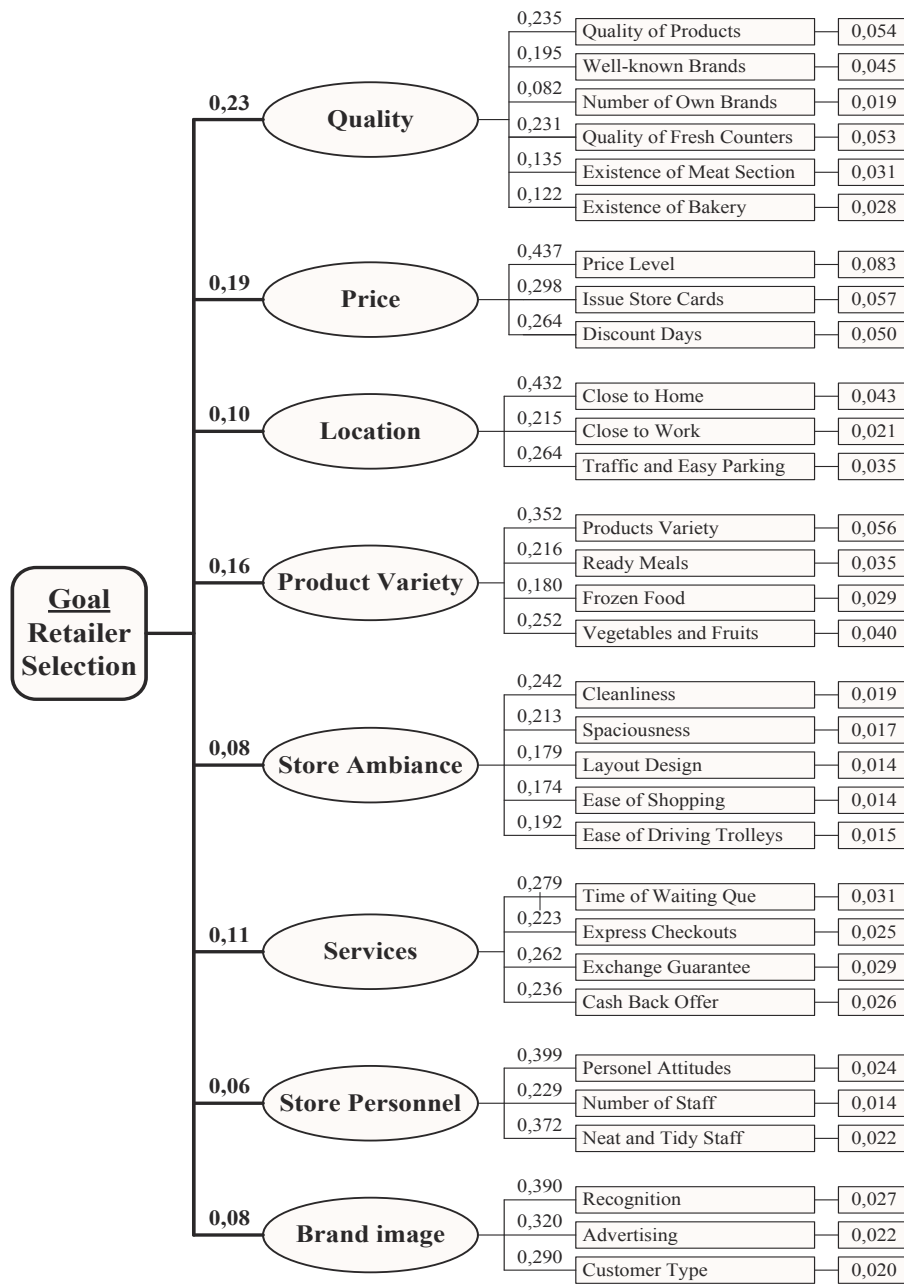


Figure 5: Hierarchical structure of the main and sub criteria for retailer selection Results of AHP Analysis

In this study, firms in different categories are discussed; the results that AHP introduces for the firms' possess some similarities are assessed. In the future, this study can be applied both to the firms that have close attributes and subsidiaries of a firm at different locations. Thus the firms can overcome their competitive weakness and by comparing their subsidiaries can strengthen their weak aspects.

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