

Comparison of Factors Affecting the Plot Value According to Participants and Provinces

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Key words: Criteria of real estate valuation, survey, factor analysis, t-test and ANOVA.

SUMMARY

The values of real estates in market conditions should be estimated in a healthy way as current. A lot of studies have been conducted especially interested in advanced valuation methods of mass real estate valuation. It is observed that these studies take into consideration different criteria. When the criteria are grouped by making a list of them, there are a lot of criteria based on legal, physical, locational and neighbourhood features. These criteria were transformed into question form and survey application was carried out in Ankara, Konya and Kayseri provinces of the Central Anatolia Region. Participants consist of experts that work on real estate valuation and citizens that play a role in real estate purchases and sales. It was discovered ten factors affecting the value of plot improved land as a result of factor analysis. In this study, factors were compared according to participants and provinces and researched different between the experts and the citizens with Independent Sampling t-Test. Moreover, it was determined that factor scores of the experts were higher than factor scores of the citizens. Whether factors were different between Ankara, Konya and Kayseri provinces or not, was tested with **Analysis of Variance (ANOVA)** according to the experts/citizens. According to analysis results, there is significantly different between them in some factors.

Arsa Deęerini Etkileyen Faktörlerin Katılımcılara ve İllere Göre Karşılaştırılması

Anahtar Kelimeler: Taşınmaz değerleme kriterleri, anket, faktör analizi, t-Testi ve ANOVA

ÖZET

Taşınmazların piyasa koşullarındaki değerleri güncel olarak sağlıklı bir şekilde tahmin edilmelidir. Toplu taşınmaz değerlemede özellikle ileri değerleme yöntemleri ile ilgili birçok çalışma yürütülmektedir. Bu çalışmaların farklı farklı kriterleri ele aldığı gözlenmekte olup kriterler listelenerek gruplandırıldığında yasal, fiziksel, konumsal ve mahalli özelliklere dayalı bir çok kriter bulunmaktadır. Bu kriterler soru formatına dönüştürülerek İç Anadolu Bölgesinin Ankara, Konya ve Kayseri illerinde anket uygulaması gerçekleştirilmiştir. Katılımcılar, taşınmaz alım-satımında rol alan aktörlerden vatandaş ve taşınmaz değerleme konusunda çalışan uzmanlardan oluşmaktadır. Faktör analizi sonucunda gelişmiş arazi olan arsanın değerini etkileyen 10 faktör elde edilmiştir. Bu çalışmada faktörler katılımcılara ve

illere göre karşılaştırılmış olup uzman ve vatandaş arasındaki fark Bağımsız Örneklem t-Testi ile araştırılmıştır. Ayrıca uzman faktör puanlarının vatandaş faktör puanlarına göre genelinde daha yüksek olduğu tespit edilmiştir. Faktörlerin Ankara, Konya ve Kayseri illerindeki uzmanlara/vatandaşlara göre farklılaşıp farklılaşmadığı Tek Yönlü Varyans Analizi (ANOVA) ile test edilmiştir. Analiz sonuçlarına göre bazı faktörlerde anlamlı bir şekilde fark bulunmuştur.

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1. INTRODUCTION

One of the most reliable investment tools in Turkey are real estates. The real estates were assets that were fixed in place and earned in long-term but were not transformed into cash in short time in case of need. In order to eliminate this disadvantage and to invest in small-scale as well, real estate projects named in "Real Estate Certificate" started to be traded in Borsa Istanbul (BİST). On a large scale, the participation shares of Real Estate Investment Trusts (REITs) as well as the shares of Real Estate Investment Funds (REIF) were traded in the BİST and presented to qualified investors. The fact that the real estates are taking place in the BİST in these forms has become an international investment tool as well as national. Thus, the volume of real estate has grown and gained a different attribution. Investment opportunities for all the investor masses were offered and the functioning of the real estates has opened the way to keep the economy alive by gaining momentum. The real estates which have no place in any activity having earned to the economy in terms of real estate to accelerate the development of Turkey is of great importance. In this regards, while the management and administration of real estates will take place with the GIS coming from the qualified database, it is essential that the real estate valuation can be carried out in a healthy manner nationwide.

As it can be done for a real estate such as real estate valuation, purchase and selling, lending and leasing, as well as the mass appraisal in a group of real estates such as taxation, expropriation, urban transformation, land consolidation. As the number of real estates is increased, the cost of valuation per real estate is decreasing. While traditional valuation methods are sufficient for valuation of a real estate, advanced or statistically valuation methods are needed in the mass appraisal (IAAO, 2013; Unel and Yalpir, 2013; Yıldız, 2014). Independent, impartial and objective evaluation of the real estate is possible by clearly revealing the properties of the real estates. In the valuation, the position of the real estate is one of the most important criteria and decisions determining the value (Yomralıoğlu et al., 2011), and each criteria to be included in the valuation processes will bring about the economic provision of the real estate. Therefore, it is very important to determine the criteria at the optimum level.

While advanced or statistically evaluation methods are applied in the literature studies, it has been determined that different criteria are considered. In the Kauko (2002) study, for example, Finland and Helsinki applied different methodologies at different scales by considering different criteria. Using a total of 16 criteria, YSA and hedonic methods were applied for the residences in the selected area. Lin (2010) applied multiple regression, nonparametric regression and YSA methods with a total of 83 criteria consisting of 66

location characteristics in the valuation of residential real estates. Schulz (2003) has been examined the German Valuation Regulation and explained traditional valuation methods and compared the success of applying linear regression and hedonic regression methods with residential-related criteria.

In the literature, it has been found out that especially the criteria related to spatial features are weighted. In the studies in which the environmental characteristics belonging to the residence taking place a total of 8 criteria are discussed, the criteria are adapted to the questionnaire based on the AHP method, the weights were determined according to the answers received from the landlords and the order of importance was determined (Bender et al., 1997; 2000). In a study similar to these, the weights of a total of 7 environmental criteria for urban commercial real estate have been calculated (Bender et al., 1999). Yomralıođlu (1993) performed a survey study by scoring over 100 criteria for value-based land use using a nominal method and weighted a total of 28 criteria. In his work Kryvobokov (2006), in order to make the mass appraisal of urban land in Ukraine, he handled a total of 10 criteria of spatial features and applied the survey prepared by using AHP method to experts to estimate criteria weights and sort them in order of priorities.

A study was carried out in 2015 so as to determine the optimum criteria for plots which are one of the real estate types. Criteria affecting the plot value were converted into survey format and questioned in the form of the question for two participants group consisting of experts and citizens in Ankara, Konya and Kayseri elected provinces for Central Anatolia Region. Experts are individuals who are experienced in real estate, and citizens are actors in real estate purchase and selling. Applying factor analysis to the data of collected survey results criteria was reduced to 10 factors (Ünel, 2017). The purpose of this study is also to investigate whether 10 factors are different between participants and provinces. Independent Sampling t-Test was used to analyse different between the experts and the citizens. The ANOVA was also performed to test different between Ankara, Konya and Kayseri provinces according to experts/citizens. According to analysis results, there is significantly different between them in some factors.

2. MATERIAL AND METHOD

2.1 The Study Area and Factors

Provinces in Central Anatolia Region in Turkey have been investigated in terms of population, the number of voters, population increase speed and net speed of migration, the number of sales, housing mortgage and the number of processes in zoning applications. It has been decided to carry out the survey on the criteria affecting the plot value in the cities of Ankara, Konya and Kayseri (Figure 1).



Figure 1. Study areas in the survey (Unel et al., 2017)

Because of the different cities and participants in the survey, three basic sample groups have appeared. The groups that are divided into experts, citizens and general groups are also grouped according to Ankara, Konya and Kayseri cities (Figure 2). Analyzes were carried out by taking into account the expert/citizen sample groups of all experts/all citizens and cities, and their results were examined (Ünel, 2017).

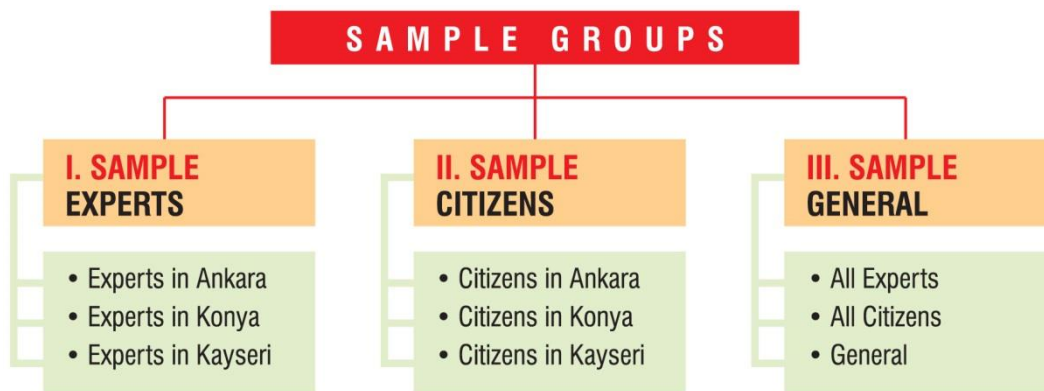


Figure 2. Sampling Groups

In the survey study, a total of 125 questions were prepared using the five-point Likert Scale with 116 questions and the mixed scale with the other questions related to the criteria affecting the value of the plot. The answers of 559 experts and 1,915 citizen participants gathered as a result of the survey study were prepared and arranged in the computer ready for analysis. Factor Analysis was applied to the 96x2,474 dimensional matrix consisting of survey data set. 96 Criteria, a total of 10 factors including Unsanitary Areas, Public Institutions, Favourite Neighbourhood Information, Technical Infrastructure Services, Zoning Status, Entertainment and Cultural Areas, Public Transportations, Green Areas, Legal

Restrains and Structuring Conditions have been obtained by reducing 69 criteria after analysis processes (Table 1).

Table 1. Reduced factors of criteria (FA-a: Total 69 criteria = 10 factors)

Factor	Name of Factor	The number of criteria
1	Unsanitary Areas	13
2	Public Institutions	11
3	Favourite Neighbourhood Information	8
4	Technical Infrastructure Services	5
5	Zoning Status	8
6	Entertainment and Cultural Areas	6
7	Public Transportations	7
8	Green Areas	4
9	Legal Restraints	4
10	Structuring Conditions	3 Toplam=69

2.2 Methods of Comparison According To Expert/Citizens and Provinces

The independent sample t-test is only suitable for examining differences between two groups. However, in practice, more than two groups may need to be compared. The appropriate test in such cases is the ANOVA test, which is a one-way ANOVA (Altunışık et al., 2010).

2.2.1 Independent Sample t-Test

The independent sample t-Test compares among people from different universes. The data should be measured at least at the interval level, for this analysis. The two groups that are compared should exhibit a normal distribution and the observations should be independent of each other, that is necessary to assume that measurements belonging to one group do not affect measurements belonging to another group. There is no obligation for both groups to have equal variances. If the variances are equal or not, that is the evaluation of the independent sample t-Test according to Levene Test result is as follows (Altunışık et al., 2010):

- If the Levene Test indicates that there is a variance difference between the groups ($p < .05$), look at the t value in the line "Variance is not equal";
 - If $p > .05$ there is no significant difference between the groups.
 - If $p < .05$ there is a significant difference between the groups.
- If the Levene Test indicates that there is no variance between the groups ($p > .05$), look at the value of t in the "Equal to variance" line;
 - If $p > .05$ there is no significant difference between the groups.
 - If $p < .05$ there is a significant difference between the groups.

2.2.2 One-Way Analysis of Variance (ANOVA)

One-way analysis of variance is used to test whether the difference between two or more unrelated sample means is significantly different from zero. In order for this analysis to be made, the following assumptions should be fulfilled (Büyüköztürk, 2002; Gülnar, 2007):

- The measurement level of the dependent variable should be at least the range scale.
- Scores show on dependent variance normal distribution at each level of the investigated factor.
- Comparable samples of mean scores are unrelated.
- The variances of the samples are equal.

In terms of the difference between the groups ($p < .05$) in the result of the ANOVA test, Post Hoc Multiple Comparison Methods are used to determine from which group the difference is derived (Köklü and Bökeoğlu, 2006). These methods are categorized into two separate classes according to the equality between groups ($p > .05$) and the unequal variances ($p < .05$) (Kayri, 2009; IBM, 2015).

- If the variances are equal:
 - Range and Dual Tests: Tukey, Hochberg's GT2, Gabriel and Scheffe
 - Range Tests: Tukey's b, S-N-K (Student–Newman–Keuls), Duncan, R-E-G-W-F (Ryan-Einot-Gabriel-Welsch F test), R-E-G-W-Q (Ryan-Einot-Gabriel-Welsch range test) and Waller-Duncan
 - Dual Tests: Bonferroni, Tukey, Sidak, Gabriel, Hochberg's GT2, Dunnett, Scheffe and LSD (Least Significant Difference) as used.
- If the variances are not equal:
 - Multiple Range Tests: Tamhane's T2, Dunnet's T3, Games-Howell and Dunnet's C are in the shape.

In this study, Bonferroni was preferred if the multiple comparison variances between groups were equal, and Tamhane's T2 was preferred if the variances were not equal. Because one of the two advantages of the Bonferroni method is that it is easy to implement and the other is that it can be used in many different test cases (Doğan and Doğan, 2014). The provision of the Bonferroni method for in case of unequal variances is Tamhane's T2 method. In addition to these, Bonferroni (ANOVA, 2015) and Tamhane's T2 methods can be used when the sample groups are not equal (Kayri, 2009).

3. COMPARISON OF FACTOR ACCORDING TO EXPERT/CITIZEN AND PROVINCES

3.1 General, Expert and Citizen Comparisons of Factors

The arithmetic means of the criteria included in the factors affecting plot value were taken separately for each participant. For each of the ten factors, the factor scores were obtained from the arithmetic mean, which was taken as the general, all expert and all citizen sample groups. Independent sample t-test was used to investigate the fact that factor scores were two groups that differed or not according to expert and citizen. According to the results of the analysis, it is seen that the factors affecting the plot value are significant differences among the five factors of ten between the experts and the citizens.

The results of the Independent Sample t-Test are as follows: Public Institutions ($t=-0.635/p>.05$), Technical Infrastructure Services ($t=1.301/p>.05$), Public Transportations ($t=1.572/p>.05$), Green Areas ($t=-0.450/p>.05$) and Structuring Conditions ($t=-0.949/p>.05$). Because the significance level is greater than 0.05, it has been shown that the factor scores do not differ significantly from the experts and the citizens. Factors with the significance (Sig.) level less than 0.05 were determined at the continuation of the test as follows: Unsanitary Areas ($t=-3.993/p<.05$), Favourite Neighbourhood Information ($t=7.714/p<.05$), Zoning Status ($t=6.062/p<.05$), Entertainment and Cultural Areas ($t=3.045/p<.05$) and Legal Restraints ($t=-5.824/p<.05$). It was seen that these factor scores differed significantly according to the expert and the citizen. Besides, it was determined that scores of expert factors were higher than those of citizen factors (Table 2).

The scores of the factors in the general, all experts and all citizens samples are sorted comparatively in absolute value from the large to small. In the three samples, the first three rows are the same and are sorted as "Zoning Status", "Technical Infrastructure Services" and "Unsanitary Areas". The "Public Transportations" and "Public Institutions" factors were the same in all sample groups and ranked 7th and 8th. According to all experts, all citizens and the general situation, the differences in the 4th, 5th, 6th, 9th and 10th rows have inferred a difference of 50% between these samples (Table 3).

Table 2. Independent sampling t-test results of factors according to expert and citizen

Factors	Expert/ Citizen	N	Mean	t Test	Sig.
Unsanitary Areas	Expert	559	-3.72	-3.993	.000
	Citizen	1,915	-3.43		
Public Institutions	Expert	559	2.85	-0.635	.526
	Citizen	1,915	2.90		
Favourite Neighbourhood Information	Expert	559	3.68	7.714	.000
	Citizen	1,915	3.21		
Technical Infrastructure Services	Expert	559	3.83	1.301	.194
	Citizen	1,915	3.75		
Zoning Status	Expert	559	4.14	6.062	.000
	Citizen	1,915	3.88		
Entertainment and Cultural Areas	Expert	559	2.38	3.045	.002
	Citizen	1,915	2.12		
Public Transportations	Expert	559	3.02	1.572	.116
	Citizen	1,915	2.91		
Green Areas	Expert	559	3.22	-0.450	.653
	Citizen	1,915	3.26		
Legal Restraints	Expert	559	-2.69	-5.824	.000
	Citizen	1,915	-2.04		
Structuring Conditions	Expert	559	3.31	-0.949	.343
	Citizen	1,915	3.37		

Table 3. Comparative sorting of factors according to general, expert and citizen

	General	Expert	Citizen
1	Zoning Status	Zoning Status	Zoning Status
2	Technical Infrastructure Services	Technical Infrastructure Services	Technical Infrastructure Services
3	Unsanitary Areas	Unsanitary Areas	Unsanitary Areas
4	Structuring Conditions	Favourite Neighbourhood Inf.	Structuring Conditions
5	Favourite Neighbourhood Inf.	Structuring Conditions	Green Areas
6	Green Areas	Green Areas	Favourite Neighbourhood Inf.
7	Public Transportations	Public Transportations	Public Transportations
8	Public Institutions	Public Institutions	Public Institutions
9	Legal Restraints	Legal Restraints	Entertainment and Cultural Areas
10	Entertainment and Cultural Areas	Entertainment and Cultural Areas	Legal Restraints

3.2 Comparisons of Experts and Citizens According to Ankara, Konya and Kayseri Provinces of Factors

The arithmetic means of the criteria included in the factors affecting the plot value were taken separately for each participant. Factor scores were attained by taking arithmetic means for ten factors according to experts and citizens in Ankara, Konya and Kayseri provinces. With the ANOVA has been tested because there are three sample groups in which the factor scores differed or not according to the experts/citizens in Ankara, Konya and Kayseri provinces. According to the results of the analysis, it is seen that the factors affecting the plot value are

the significant difference five factors of the ten among the experts in Ankara, Konya and Kayseri provinces. It is seen that the factors affecting the plot value are the significant difference among the citizens of Ankara, Konya and Kayseri seven factors of the ten.

3.2.1 Factors compared to experts in Ankara, Konya and Kayseri

The ANOVA was used to test whether the factor scores differed according to experts in Ankara, Konya and Kayseri. The ANOVA revealed that the scores of the factor did not differ significantly according to experts from those in Ankara, Konya and Kayseri. Results are as shown next: Unsanitary Areas ($F=2.551/p>.05$), Public Institutions ($F=1.219/p>.05$), Favourite Neighbourhood Information ($F=2.925/p>.05$), Entertainment and Cultural Areas ($F=1.061/p>.05$) and Legal Restraints ($F=.121/p>.05$). It is revealed that the scores of the factor differed significantly according to experts from those in Ankara, Konya and Kayseri. Results are as shown next: Technical Infrastructure Services ($F=5.471/p<.05$), Zoning Status ($F=3.173/p<.05$), Public Transportations ($F=4.069/p<.05$), Green Areas ($F=11.052/p<.05$) and Structuring Conditions ($F=17.341/p<.05$) (Table 4).

Table 4. The ANOVA results of the factors experts in Ankara, Konya and Kayseri

Factors	Provinces	N	Mean	F Test	Sig.
Unsanitary Areas	Ankara	208	-3.87	2.551	.079
	Konya	221	-3.56		
	Kayseri	130	-3.76		
Public Institutions	Ankara	208	2.94	1.219	.296
	Konya	221	2.75		
	Kayseri	130	2.89		
Favourite Neighbourhood Information	Ankara	208	3.80	2.925	.055
	Konya	221	3.54		
	Kayseri	130	3.73		
Technical Infrastructure Services	Ankara	208	4.02	5.471	.004
	Konya	221	3.66		
	Kayseri	130	3.81		
Zoning Status	Ankara	208	4.23	3.173	.043
	Konya	221	4.04		
	Kayseri	130	4.17		
Entertainment and Cultural Areas	Ankara	208	2.44	1.061	.347
	Konya	221	2.43		
	Kayseri	130	2.19		
Public Transportations	Ankara	208	3.07	4.069	.018
	Konya	221	3.16		
	Kayseri	130	2.72		
Green Areas	Ankara	208	3.57	11.052	.000
	Konya	221	2.85		
	Kayseri	130	3.30		
Legal Restraints	Ankara	208	-2.64	0.121	.886

	Konya	221	-2.74		
	Kayseri	130	-2.68		
Structuring Conditions	Ankara	208	3.61	17.341	.000
	Konya	221	2.95		
	Kayseri	130	3.47		

The factors affecting the value of plot; Tamhane and Bonferroni methods have been applied in order to demonstrate that there is a significant difference among the experts in Ankara, Konya and Kayseri provinces. Tamhane method was used as the variances of the Public Transportations and Structuring Conditions Factor are not homogeneous, that is equal. Bonferroni method was used as the variances of the other factors were homogeneous, that is not equal.

Whether the Public Transportations and Structuring Conditions factors differed significantly according to experts in Ankara, Konya and Kayseri have been tested using the Tamhane method because the variances are not homogeneous.

- Experts in Konya (Mean=3.16), according to experts in Kayseri (Mean=2.72), in the Public Transportations factor and
- Experts in Ankara (Mean=3.61) and Kayseri (Mean=3.47), according to the experts in Konya (Mean=2.95) in the Structuring Conditions factor

have been shown to give more importance significantly.

Whether the Technical Infrastructure Services, Zoning Status and Green Areas factors are significantly different according to experts in Ankara, Konya and Kayseri have been tested using the Bonferroni method because of the homogeneous of their variances.

- Experts in Ankara (Mean=4.02), according to experts in Konya (Mean=3.66) in the Technical Infrastructure Services factor,
- Experts in Ankara (Mean=4.23), according to experts in Konya (Mean=4.04) in the Zoning Status factor, and
- Experts in Ankara (Mean=3.57) and Kayseri (Mean=3.30), according to experts in Konya (Mean=2.85) in the Green Areas factor

have been detected to be more significant.

Factors; According to experts in Ankara, Konya and Kayseri, comparatively presented according to importance. According to the experts in Ankara, Konya and Kayseri, the first four and the last two factors are the same, the first four factors are “Zoning Status”, “Technical Infrastructure Services”, “Unsanitary Areas” and “Favourite Neighbourhood Information”, and the last two factors are “Legal Restrictions and “Entertainment and Cultural Areas”. According to the experts in Ankara, Konya and Kayseri, the fact that the 5th, 6th, 7th and 8th rows are different indicates that there is a difference of 40% among these samples (Table 5).

Table 5. Comparatively sorting of factors according to experts in Ankara, Konya and Kayseri

	Ankara	Konya	Kayseri
1	Zoning Status	Zoning Status	Zoning Status
2	Technical Infrastructure Services	Technical Infrastructure Services	Technical Infrastructure Services
3	Unsanitary Areas	Unsanitary Areas	Unsanitary Areas
4	Favourite Neighbourhood Inf.	Favourite Neighbourhood Inf.	Favourite Neighbourhood Inf.
5	Structuring Conditions	Public Transportations	Structuring Conditions
6	Green Areas	Structuring Conditions	Green Areas
7	Public Transportations	Green Areas	Public Institutions
8	Public Institutions	Public Institutions	Public Transportations
9	Legal Restraints	Legal Restraints	Legal Restraints
10	Entertainment and Cultural Areas	Entertainment and Cultural Areas	Entertainment and Cultural Areas

3.2.2 Factors compared to citizens in Ankara, Konya and Kayseri

With the ANOVA has been tested whether the factor scores differed according to the citizens in Ankara, Konya and Kayseri. The ANOVA results; Entertainment and Cultural Areas ($F=2.270/p>.05$), Public Transportations ($F=1.818/p>.05$) and Legal Restraints ($F=2.093/p>.05$) factor scores have been revealed that significantly didn't differentiate according to citizens in Ankara, Konya and Kayseri. Unsanitary Areas ($F=11.376/p<.05$), Public Institutions ($F=4.279/p<.05$), Favourite Neighbourhood Information ($F=4.027/p<.05$), Technical Infrastructure Services ($F=9.832/p<.05$), Zoning Status ($F=3.754/p<.05$), Green Areas ($F=15.924/p<.05$) and Structuring Conditions ($F=14.392/p<.05$) factor scores have been seen that significantly differed according to citizens in Ankara, Konya and Kayseri (Table 6).

Table 6. The ANOVA Results of Factors in Ankara, Konya and Kayseri Citizens

Factors	Provinces	N	Mean	F Test	Sig.
Unsanitary Areas	Ankara	546	-3.58	11.376	.000
	Konya	942	-3.23		
	Kayseri	427	-3.68		
Public Institutions	Ankara	546	2.87	4.279	.014
	Konya	942	2.82		
	Kayseri	427	3.09		
Favourite Neighbourhood Information	Ankara	546	3.21	4.027	.018
	Konya	942	3.13		
	Kayseri	427	3.39		
Technical Infrastructure Services	Ankara	546	3.86	9.832	.000
	Konya	942	3.60		
	Kayseri	427	3.94		
Zoning Status	Ankara	546	3.82	3.754	.024
	Konya	942	3.86		
	Kayseri	427	4.01		
Entertainment and Cultural Areas	Ankara	546	2.27	2.270	.104
	Konya	942	2.07		

	Kayseri	427	2.03		
Public Transportations	Ankara	546	2.84	1.818	.163
	Konya	942	2.90		
	Kayseri	427	3.04		
Green Areas	Ankara	546	3.31	15.924	.000
	Konya	942	3.05		
	Kayseri	427	3.63		
Legal Restraints	Ankara	546	-2.17	2.093	.124
	Konya	942	-2.06		
	Kayseri	427	-1.82		
Structuring Conditions	Ankara	546	3.52	14.392	.000
	Konya	942	3.22		
	Kayseri	427	3.52		

The factors affecting the value of plot; Tamhane and Bonferroni methods have been applied in order to demonstrate that there is a significant difference among the citizens in Ankara, Konya and Kayseri provinces. The Tamhane method was used because the variances of Unsanitary Areas, Public Institutions, Technical Infrastructure Services, Zoning Status, Green Areas and Structuring Conditions Factor were not homogeneous; the Bonferroni method was used because the variances of other factors were homogeneous.

Since the variances of Unsanitary Areas, Public Institutions, Technical Infrastructure Services, Zoning Status, Green Areas and Structuring Conditions Factor are not homogeneous; it was investigated whether there is a significantly different according to the citizens of Ankara, Konya and Kayseri using Tamhane method.

- Citizens of Kayseri (Mean=-3.68) and Ankara (Mean=-3.58), according to the citizens of Konya (Mean=-3.23) in the Unsanitary Areas factor and,
- Citizens in Kayseri (Mean=3.09), according to citizens in Konya (Mean=2.82) in the Public Institutions factor,
- Citizens in Kayseri (Mean=3.94) and Ankara (Mean=3.86), according to citizens in Konya (Mean=3.60) in the Technical Infrastructure Services factor,
- Citizens in Kayseri (Mean=4.01), both according to citizens in Konya (Mean=3.86) and Ankara (Mean=-3.82) in the Zoning Status factor,
- Citizens in Kayseri (Mean=3.63), according to citizens in Ankara (Mean=3.31) and Konya (Mean=3.05) [also citizens in Ankara (Mean=3.31) according to citizens in Konya (Mean=3.05)] in the Green Areas factor, and
- Citizens in Ankara (Mean=3.52) and Kayseri (Mean=3.52), according to citizens in Konya (Mean=3.22) in the Structuring Conditions factor

have been observed to give more importance significantly.

Whether the Favourite Neighbourhood Factor is significantly different from the citizens of Ankara, Konya and Kayseri have been tested using the Bonferroni method because of the homogeneous of its variances.

- Citizens in Kayseri (Mean=3.39), according to citizens in Konya (Mean=3.13) in the Favourite Neighbourhood Information factor

has been revealed that to give more importance significantly.

The factors are presented according to their importance in comparison with the citizens in Ankara, Konya and Kayseri. The factor order for "Zoning Status", "Technical Infrastructure Services" and "Unsanitary Areas" in the first three comparisons of all sample groups examined above changed only for the citizens of Ankara. According to the citizens of Ankara, Konya and Kayseri, it was observed that the 3rd and 9th-10th factors did not change their ranks. Other factors (1, 2, 4, 5, 6, 7 and 8th rank) show differentiate according to provinces and there is a 70% difference among citizens in Ankara, Konya, and Kayseri (Table 7). According to the citizens in Ankara, Konya and Kayseri, the last two rows were in the form of Entertainment and Cultural Areas and Legal Restraints, whereas, was observed that expert in Ankara, Konya and Kayseri sorted the opposite.

Table 7. Comparatively sorting of factors according to citizens in Ankara, Konya and Kayseri

	Ankara	Konya	Kayseri
1	Technical Infrastructure Services	Zoning Status	Zoning Status
2	Zoning Status	Technical Infrastructure Services	Technical Infrastructure Services
3	Unsanitary Areas	Unsanitary Areas	Unsanitary Areas
4	Structuring Conditions	Structuring Conditions	Green Areas
5	Green Areas	Favourite Neighbourhood Information	Structuring Conditions
6	Favourite Neighbourhood Inf.	Green Areas	Favourite Neighbourhood Inf.
7	Public Institutions	Public Transportations	Public Institutions
8	Public Transportations	Public Institutions	Public Transportations
9	Entertainment and Cultural Areas	Entertainment and Cultural Areas	Entertainment and Cultural Areas
10	Legal Restraints	Legal Restraints	Legal Restraints

4. CONCLUSION

Status of real estate in Turkey has changed over the last decade is on its way up easily and quickly converted into liquidity. Thus, the value is at the forefront leads to the development, management and administration of real estates. In other words, transparent and clear knowledge of real estate prices is a route map for the purchaser, investor and user. Herein, the provision of the route map is a valuation map. Data, consisting of optimum criteria should be produced from the model values obtained using the generally accepted analysis method. The major issue is seen as determining the optimum criteria according to real estate types.

The criteria affecting the plot value of real estate types vary from country to country, from region to region and from person to person. It can be seen that the region is subject to many changes such as demographics, education, income, immigration, crime, social structure, lifestyles, culture and traditions as well as topographic, geological and meteorological characteristics, noise and air pollution. In this study, it has been proved that the factors that consisting of the criteria differ statistically significantly among the experts and citizens in Ankara, Konya and Kayseri. It has been determined that all experts and all citizens are subject to half-and-half differentiation and that all experts have given more importance to the Unsanitary Areas, Favourite Neighbourhood Information, Zoning Status, Entertainment and

Cultural Areas and Legal Restrictions factors according to all citizens. There are also differences in the results of analysis of cities by experts and citizen participants. It was identified that the experts in Ankara give more importance statistically in terms of Structuring Conditions, technical Infrastructure Services, Zoning Status and Green Areas in Konya, while Konya also give more importance to Public Transportations factor in Kayseri. In all the factors other than Entertainment and Cultural Areas, Public Transportations and Legal Restraints, citizens in Kayseri have been detected to give more importance significantly in Konya compared to others in Ankara. Besides, it was observed that the difference of importance between the provinces of the citizens was 70% and more than the other comparatives.

Although the criteria affecting the plot value vary according to the person, those with considerably the economic impact the value should be determined in a clear, obvious and standard format. These criteria should be chosen by considering statistical significance. Otherwise, the collection of the smallest details about the real estate will not be significant in terms of time, labour and cost. Similar implementation, agricultural lands, housing, industry and etc. real estates as well should be carried out.

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REFERENCES

- Altunışık, R., Coşkun, R., Bayraktaroğlu, S. and Yıldırım, E., 2010, Sosyal bilimlerde araştırma yöntemleri SPSS uygulamalı, Sakarya, Sakarya Yayıncılık.
- ANOVA, 2015, Multiple Comparison Procedures, [25.10.2015], http://psych.colorado.edu/~carey/Courses/PSYC5741/handouts/Multiple_Comparison_Procedures.pdf:
- Bender, A., Din, A., Favarger, P., Hoesli, M. and Laakso, J., 1997, An analysis of perceptions concerning the environmental quality of housing in Geneva, *Urban Studies*, 34 (3), 503–513.
- Bender, A., Din, A., Hoesli, M. and Laakso, J., 1999, Environmental quality perceptions of urban commercial real estate, *Journal of Property Investment & Finance*, 17 (3), 280–296.
- Bender, A., Din, A., Hoesli, M. and Brocher, S., 2000, Environmental preferences of homeowners, further evidence using the AHP method, *Journal of Property Investment & Finance*, 18 (4), 445–455.
- Büyüköztürk, Ş., 2002, Faktör Analizi: Temel kavramlar ve ölçek geliştirmede kullanımı, *Kuram ve Uygulamada Eğitim Yönetimi*, 32, 470–483.

- Doğan, N. and Doğan, İ., 2014, Birinci Tür Hata'nın kontrolü ve adımsal (Stepwise) çoklu karşılaştırma testleri, Düzce Üniversitesi, Sağlık Bilimleri Enstitüsü Dergisi, 4 (1), 28–33.
- Gülner, B., 2007, Araştırma görevlilerinin iş tatminini sağlama aracı olarak örgütsel iletişim ve iletişim doyumu: Kamu ve özel üniversite karşılaştırması, Selçuk Üniversitesi, Sosyal Bilimler Enstitüsü, Doktora Tezi, Konya.
- IAAO, 2013, Standard on mass appraisal of real property. USA, The International Association of Assessing Officers.
- IBM, 2015, One-Way ANOVA Post Hoc Tests, [25.10.2015], http://www-01.ibm.com/support/knowledgecenter/SSLVMB_23.0.0/spss/base/idh_onew_post.dita.
- Kauko, T. J., 2002, Modelling the locational determinants of house prices: neural network and value tree approaches, Utrecht University, PhD, Netherlands.
- Kayri, M., 2009, Araştırmalarda gruplar arası farkın belirlenmesine yönelik çoklu karşılaştırma (Post-Hoc) teknikleri, Fırat Üniversitesi, Sosyal Bilimler Dergisi, 19 (1), 51–64.
- Köklü, N., Ş., B. and Bökeoğlu, Ç. Ö., 2006, Sosyal bilimler için istatistik, Ankara, PegemA Yayıncılık.
- Kryvobokov, M., 2006, Mass valuation of urban land in Ukraine: From normative to a market-based approach, Real Estate and Construction Management School of Architecture and The Built Environment Royal Institute of Technology, PhD, Stockholm.
- Lin, C. C., 2010, Critical analysis and effectiveness of key parameters in residential property valuations, State University of New York, The Faculty of The Graduate School of The University at Buffalo, PhD, New York.
- Schulz, M. A. R., 2003, Valuation of properties and economic models of real estate markets, Humboldt-University, Wirtschaftswissenschaftlichen Fakultät, PhD, Berlin.
- Unel, F. B. and Yalpir, S., 2013, Grouping and analyzing of real estate valuation approaches, International Journal of Multidisciplinary Thought, 3 (1), 171–182.
- Unel, F. B., Yalpir, S. and Gulnar, B., 2017, Preference changes depending on age groups of criteria affecting the real estate value, International Journal of Engineering and Geosciences (IJEG), 2 (2), 41–51.
- Ünel, F. B., 2017, Taşınmaz değerlendirme kriterlerine yönelik coğrafi veri modelinin geliştirilmesi, Selçuk Üniversitesi, Fen Bilimleri Enstitüsü, Doktora Tezi, Konya.
- Yıldız, Ü., 2014, Gayrimenkul bilimlerinde kitlesel değerlendirme uygulamaları ve Türkiye için model önerisi, Ankara Üniversitesi, Fen Bilimleri Enstitüsü, Yüksek Lisans Tezi, Ankara.
- Yomralıoğlu, T., 1993, A Nominal asset value-based approach for land readjustment and its implementation using Geographical Information Systems, University of Newcastle upon Tyne, PhD, UK.
- Yomralıoğlu, T., Nişancı, R., Çete, M. and Candaş, E., 2011, Dünya'da ve Türkiye'de taşınmaz değerlemesi. Türkiye'de Sürdürülebilir Arazi Yönetimi Çalıştayı. İstanbul, Okan Üniversitesi.

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