HEDONIC ESTIMATION OF HOUSING MARKET PRICES IN TURKEY

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ABSTRACT

In this study, there has been aimed to determine the factors that affect the price of flats in the housing sector in Turkey with a hedonic pricing model. According to the model results, the house's having residential swimming pool, a jacuzzi and a water tank, its being a duplex, its central heating system, its being closer to the center, the size of the house, the bathroom floor's being vinyl or PVC, being closer to banking services and compulsory education services, its having cable TV, telephone lines and parking opportunities increases the value of the house. The house is in the basement or ground floor of the building construction date is first, the room is the floor of ceramic tiles, bathroom floor screed (concrete road) the fuel used is coal, reduces the value of the house.

Keywords: Housing Prices, Hedonic Pricing Model, Housing Market, Turkey.

TÜRKİYE'DEKİ KONUT PİYASASI FİYATLARININ HEDONİK TAHMİNİ

ÖZ

Bu çalışmada, Türkiye konut sektöründe apartman dairelerinin fiyatını etkileyen faktörlerin belirlenmesi amaçlanmıştır Model sonuçlarına göre, konutlarda havuz, jakuzi ve su deposu bulunması, konutun dubleks daire olması, ısı sisteminin müşterek/merkezi olması, konutun büyüklüğü, banyo zemininin marley ya da PVC olması, banka hizmetlerine ve zorunlu eğitim hizmetlerine yakın olması, kablolu yayın, telefon hattı ve garaj bulunması konutun değerini artırmaktadır. Konutun bodrum ya da zemin kat olması, binanın yapım tarihinin eski olması, oda zemininin karo seramik olması, banyo zemininin şap (kara beton) olması, kullanılan yakıtın kömür olması konutun değerini düşürmektedir.

Anahtar Kavramlar: Konut Fiyatları, Hedonik Fiyatlama Modeli, Konut Piyasası, Türkiye.

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Makalenin kabul tarihi: Temmuz 2014.

INTRODUCTION

One of humanity's most basic needs is shelter needs. With the advancement of technology and the development of communities where the properties of basic consumption goods have increased, as have the shelter of the features that eliminate the need for housing has also increased. With rapid population growth, technological developments, the change in the economic structure of society, the acceleration of rural-urban migration and urbanization, social and economic development of the housing sector has become more important and diversified housing properties. Residences of individuals with physical needs such as shelter, psychological and social needs meet together has become a consumer good.

Either as being the owner of a house or the one who benefits from the tenancy, each individual certainly has a house demand in which they will want to live inside. The housing demand can be consumption intended or investment property. One of the most important factors that affect consumption-intended housing demand has been individual's pleasure and preferences. While the individual demand consumption intended housing, they have been under the influence of benefits that provide pleasure to themselves such as being different, strong, achieving success, obtaining social statue or of rational benefits such as the price and quality. The benefits that provide pleasure to the individuals create intrinsic satisfaction going beyond the satisfaction obtained through the sense organs. So, hedonic consumption means consumed productions' providing intrinsic satisfaction to individuals.

The factors that specify the housing demand provided by pleasure and preferences have been the qualities of the demanded house. Housing market is a heterogeneous market and each house has different distinctive characteristics. Houses' having different characteristics results in their having different values and prices. The characteristics of a house affect its value positively or negatively, so that an implicit price occurs. In order to reveal implicit effect of the characteristics that determine the value of a house upon the value of the house, there has been benefited from hedonic pricing models.

In this study, there has been aimed to determine which house characteristics have negative or positive effects upon the value of the house in Turkey and measure those effects using hedonic pricing model. The data used in the study have been the data of Turkish Statistical Institute (TSI) Household Budget Survey that belongs to 3709 houses. There have been included forty five independent variables considered to explain the market price of the house into the model. In the study, there have been carried out with linear, logarithmic linear and full logarithmic models and effects upon the prices have been

calculated. There has been established a general model including quantitative and dummy variables.

I. HEDONIC PRICING MODEL

Hedonic consumption which has been an important field of consumer behavior has been a form of consumption focusing upon completing instrinsic satisfaction (Sapangenberg vd., 1997: 239). According to the study carried out by Hirschman and Holbrook in 1982, the consumer not only does the shopping in order to provide benefit from the purchased goods. Together with the obtained profit, individuals also do the shopping in order to satisfy their pleasure regarding shopping experience as a pleasure. The preferences that create the basic factors of hedonic consumption have been related to sight, hearing, touch, smell and taste. Individuals not only respond to multiple affective impressions of external stimulus, but also they responds creating an image within themselves, at the same time (Hirschman, Holbrook, 1992: 92-101).

While the individuals choose a product they behave in a way in which they will maximize their own benefits according to some characteristics of that product. Those chatacteristics have been in a quality that increase or decrease the value of the product. The value of a product also differs from region to region and country to country. The reason for this is the meaning attributed to the product by the individuals. The benefit means the happiness obtained by the individual from a product; in other words, a satisfaction criteria (Mankiw, 2001: 471). There have been developed some models to measure the benefit. One of them is hedonic pricing model. There has been asserted in hedonic pricing model that the value of a product (in current situation, a house) depends upon the quantity of its features; so that, the price of a product will be the function of its features/characteristics (Parmeter vd., 2007: 696). Using the hedonic pricing model, there has been determined the marginal value consented by individuals to be paid to the preferred product. So, hedonic pricing model can be applied to differentiated product market. This method helps consumers to determine the most important factors when they have preferred the features and relative prices of the houses (Yang, 2001: 51). “Regression” side of hedonic regression expresses how implicit prices of the characteristics have been measured (Hill, Melser, 2008: 593). So that, there has been determined for what features the consumers have paid more.

A.T. Court created the first hedonic price model in 1939 with his study and discussed the price of car as a function of the car’s various features and analyzed hedonic prices of heterogeneous products (Griliches,1991: 185). Haas (1922) created a simple hedonic pricing model using distance to city center and city size as variables in his study (Wen vd., 2005: 908).

Consumer demand theory of Lancaster (1966) assumes that people have accepted goods as the total of valued characteristics. So that, it depends upon the relative benefit of each characteristic that creates the purchase decision of the consumer. According to Lancaster, the good does not directly provide benefit to the consumer; however, the benefit increases because of the features that a good has. In general, a good has more than one features and one feature can be available in more than one goods.

In his study in 1976, Rosen discussed the first hedonic equilibrum supply and demand model depending upon good characteristics. Under perfect competition assumption, he analyzed short and long term equilibrum that maximize the profit of producer and maximize the benefit of consumer. He deduced that hedonic price characteristics function has not been determined by supply and demand (Rosen, 1976: 22).

In Rosen's model, goods (Z) have been the total of n numbered characteristics that belong to goods.

$$Z = (Z_1, Z_2, Z_3, \ldots., Z_n) \quad (1)$$

Rosen's model has been expressed as such (Rosen, 1974:37); the goods have been defined with the possible numerical values of Z and presented different characteristics components to the buyers. Existence of product differentiation occurred with goods' having different characteristics reveals a wide range of alternative characteristics compound. In this sense, product demand function is shown as;

$$P(z) = p(z_1, z_2, \ldots z_n) \quad (2)$$

This demand function expresses the hedonic price regression obtained after comparison of label prices that have different characteristics. Implicit price of house characteristics can be obtained by calculating the partial differentiation of (1) numbered equity with each house characteristic variable (Wen, Jia and Guo, 2005:908):

$$P_{Zi} = \frac{\partial P}{\partial Z_i} \quad (3)$$

Both Lancaster's approach and Rosen's approach have tried to determine the qualities that affect the benefit, have been measured objectively and created gathering a great number of product qualities valued by the consumer. Lancaster's model assumes that products have occurred from qualitative components depending upon the budget constraint and those have been the members of the same group; and Rosen's model reveals that consumers haven't had preferences related to qualities while buying product combinations and there has been a preference order among the products (Yayar, 2011:23). Whereas

Lancaster's model has been valid for whole consumption goods, Rosen's model has only been valid for only durable consumer goods; because it has been possible for products to be used together in Lancaster's model. According to Rosen, there has been a nonlinear relationship between prices of products and their inner qualities.

II. LITERATURE SUMMARY

In this section of the study, there have been given place to studies carried out with hedonic regression model and taken place in the literature. There have been a great number of national and international studies implementing the aforementioned model upon the housing market as our research subject.

One of the first studies in which hedonic price theory has been applied to the housing market has been a study carried out by Ridker and Henning in 1967. In this study, there was revealed the effect of developing nature quality (such as eliminating the air pollution) upon house prices (Ridker, Henning, 1967: 257). In their study, Kain and Quigley (1970) found that qualities such as the quality of housing services, number of rooms, number of bathrooms and acreage have affected housing prices in semi logarithmic and linear model they carried out 854 restricted observation and totally 1184 observations of house selling. Yang (2001) analyzed certain price of house characteristics including physical structure, location, environment and structure quality risk in his study carried out in China. Implementation results showed that consumers have been ready to pay much money in order to avoid from the risk of low structure quality. Wen, Lu and Lin (2004) have revealed that only 6 of 18 variables such as age of house, location (north-south, east-west), distance to university, distance to important institutions as hospital, post office, bank, distance to city center (km), distance to the lake in south (km) have affected the price of the house negatively, rest of the variables housing sale price positively. Toda and Nozdrina (2004) have determined in their study that the variables of distance to the closest metro station (meter), distance to city center (km) and accrued taxes have affected housing prices negatively and variables as house size (the one that have hall and bathroom), kitchen size and number of workers desired by entrepreneurs to be worked in apartments have affected positively. In their study, Cohen and Coughlin (2005) analyzed the effects of distance to the airport, level of noise and house characteristics upon the housing prices near the airport. Recovery in characteristics of a house and distance of the house to the airport have affected housing prices positively. There has been determined a negative relationship between the decrease at the level of noise and housing prices. Wen, Jia and Guo (2005) chose 18 features as independent variables in their study they carried out for the province of Hangzhou and they created a linear hedonic price model. The model was tested with 2473 house examples and 290 housing

property data. They found that 14 of 18 independent variables had significant effect upon the housing prices. Moreover, they categorized those variables under 5 groups according to their degree of influence. In his study in which he searched for the houses for sale and rent in ıstanbul, Levent (1995) determined that some of house characteristics have been efficient upon the price. On the other hand, there could not be found a variable that is efficient upon the price except from standard house characteristics in houses for rent. In his study, Üçdogruk (2001) included the market price of the house as the dependent variable and self characteristics of the house (number of rooms, heating system, hall floor, roof insulation, etc.) as the independent variables into his study. There has been established a general model including first the quantitative variables and then both the quantitative and dummy variables. In quantitative-variable hedonic model, number of rooms has been found as statistically insignificant. In the other model, room heater, central heating and geothermal energy have been noticed as increasing the price of the house more than the heating stove. When the variables have been analyzed in the study of Yankaya and Çelik (2005), whereas walking distance to metro station (meter), distance to the bus station (meter) and age of the house have affected the housing prices negatively, the other variables have had positive effect upon the housing prices. According to linear and logarithmic model, the most significant indicator of the value has been the size of the house. Model results have revealed that the investment in transportation sub-structure increases the housing prices within their influence area. Selim (2008) analyzed the factors that determined housing prices using the 2004 Hosehold Budget Survey data. The most important variables that affect housing prices have been determined as the variables such as type of the house, type of the structure, number of rooms, size of the house and other structural variables such as water system of the house, swimming pool, the house's having natural gas. In their study Çubukçu and Çetintahra (2011) tried to measure the effect of environment aesthetics upon the housing prices gathering the two different literatures relevant to the housing using hedonic price model. Results have proved that "desire to own a house" of spatial aesthetics has affected the purchase price and "complicated" and "well-cared" situations of the house surrounding has affected the price for rent.

III. DATA AND METHODOLOGY

The data have been provided from TSI Household Budget Survey 2010 results. The number of observations used in the model has been 3709. The number of independent variables included into the study has been 45 and descriptive statistics have been shown in Table 1.

Housing prices has been determined 92.447 TL and constructional areas has been determined 110.16 m^2 as average. 88,22% of the houses have been on

typical floor and 78,24% of the residents have been house owners. As of the built date of the houses, the average has been the year of 1991. When surface texture of the houses has been analyzed, there has been determined that 46,27% have had parquet, 92,48% of bathrooms have had tile floors; there has been heating stove in 35,99% of the houses as the heating system and 35,86% have had room heater or combi boiler. There has also been determined that natural gas has been used in 42,09%, 24,64% have used wood as fuel; and 74,795 have had telephone lines and 44,84% have had natural gas ownership. There have been elevator in 25,10% and water tank in 10,39% of the houses.

Table 1: Descriptive Statistics

Variables (N=3709)		**Min.**	**Max.**	**Average**	**Standard Deviation**
Market value of the house	HPRICE	10000,0	1500000,0	92447,0208	68588,1160
Type of resided flat					
If basement/ground=1; if not=0	HSETYPE1	0,0	1,0	0,0903	0,2867
If typical floor=1; if not =0	HSETYPE2[a]	0,0	1,0	0,8822	0,3224
If duplexflat=1; if not =0	HSETYPE3	0,0	1,0	0,0232	0,1505
If penthouse=1; if not =0	HSETYPE4	0,0	1,0	0,0043	0,0656
Property of flat					
If the owner=1; if not =0	PRPERTY1[a]	0,0	1,0	0,7824	0,4127
If lodging house=1; if not =0	PRPERTY2	0,0	1,0	0,0450	0,2074
If the other (mosaic, marble, etc.)=1; if not =0	PRPERTY3	0,0	1,0	0,1726	0,3779
Construction date of the building	BCONSD	1925,0	2010,0	1991,3842	11,4463
Size of the house	HSIZE	25,0	390,0	110,1628	29,5722
Surface texture of the rooms in the house					
If parquet=1; if not =0	ROMFLR1[a]	0,0	1,0	0,4627	0,4987
If wood=1; if not =0	ROMFLR2	0,0	1,0	0,1647	0,3710
If tile=1; if not =0	ROMFLR3	0,0	1,0	0,1140	0,3179
If vinyl floor, PVC=1; if not =0	ROMFLR4	0,0	1,0	0,1585	0,3653
If wall to wall carpeting=1; if not =0	ROMFLR5	0,0	1,0	0,0280	0,1651
If cement finish=1; if not=0	ROMFLR6	0,0	1,0	0,0356	0,1853
Other(mosaic, marble, etc.)=1; if not =0	ROMFLR7	0,0	1,0	0,0364	0,1873
Surface texture of bathroom					
If tile=1; if not =0	BTHRFLR1[a]	0,0	1,0	0,9248	0,2638
If cement finish=1; if not =0	BTHRFLR2	0,0	1,0	0,0288	0,1674

Table 1: (Continued)

If mosaic=1; if not =0	BTHRFLR3	0,0	1,0	0,0361	0,1866
Other(mosaic, marble, etc.)=1; if not =0	BTHRFLR4	0,0	1,0	0,0102	0,1007
Heating system of the house					
If heating stove=1; if not =0	HEATSYST1	0,0	1,0	0,3599	0,4801
If common/central=1; if not =0	HEATSYST2	0,0	1,0	0,2017	0,4013
If room heater/combi boiler=1; if not =0	HETSYST3[a]	0,0	1,0	0,3586	0,4797
If air conditioning=1; if not =0	HEATSYST4	0,0	1,0	0,0752	0,2638
If the other=1; if not =0	HEATSYST5	0,0	1,0	0,0046	0,0676
Type of fuel					
If wood=1; if not =0	FUEL1	0,0	1,0	0,2464	0,4310
If coal=1; if not =0	FUEL2	0,0	1,0	0,1974	0,3981
If natural gas=1; if not =0	FUEL3[a]	0,0	1,0	0,4209	0,4938
If electricity=1; if not =0	FUEL4	0,0	1,0	0,1151	0,3192
Other(Fueloil, diesel oil, etc.) =1; if not =0	FUEL5	0,0	1,0	0,0202	0,1408
Transportation difficulty to banking services (1=very hard; 2=hard; 3=easy; 4=very easy)	BNKSERV	1,0	4,0	2,9841	0,7102
Transportation difficulty to health services (1=very hard; 2=hard; 3=easy; 4=very easy)	HLTHSERV	1,0	4,0	3,1564	0,6295
Transportation difficulty to education services (1=very hard; 2=hard; 3=easy; 4=very easy)	CEDUSERV	1,0	4,0	3,2041	0,5981
Sauna ownership (yes=1; no=0)	SAUNA	0,0	1,0	0,0008	0,0284
Jakuzzi ownership (yes =1; no=0)	JAKUZZI	0,0	1,0	0,0089	0,0939
Garbage disposalownership (yes=1; no=0)	GARDIS	0,0	1,0	0,0011	0,0328
Underfloor heating ownership (yes =1; no=0)	UNDRHEAT	0,0	1,0	0,0078	0,0881
Water tankownership (yes=1; no=0)	WATTNK	0,0	1,0	0,1939	0,3954
Natural gasownership (yes=1; no=0)	NATGAS	0,0	1,0	0,4484	0,4974
Cable castownership (yes=1; no=0)	CABCAST	0,0	1,0	0,0871	0,2820
Elevatorownership (yes=1; no=0)	ELEVTR	0,0	1,0	0,2510	0,4337
Garage ownership (yes=1; no=0)	PARKNG	0,0	1,0	0,0733	0,2607
Swimming pool ownership (yes=1; no=0)	SWPOOL	0,0	1,0	0,0092	0,0953
Generatorownership (yes=1; no=0)	GNRTOR	0,0	1,0	0,0205	0,1417
Telephone line ownership/number	TLPHLINE	0,0	2,0	0,7479	0,4543

[a]The reference has been taken as category.

In general, linear, semi-logarithmic (Log-dog) and full-logarithmic functions have been used for hedonic model during the analysis. In this study, as well, there has been experimented linear, semi and full-logarithmic regression models. There has been established an empirical model accepting market price of the house (HPRICE) as the dependent and the others as independent variables among the ones that take place within Table 1. There has been encountered to the variance problem in established models and the problem has been tried to be overcome using White has developed consistent variance-covariance matrix.

IV.EMPIRICAL EVIDENCE

Linear, semi-logarithmic and full-logaritmic regresion model results have been presented in Table 2. The variables of HSETYPE4, HLTHSERV, SAUNA, UNDRHEAT and GNRTOR included in the regression model have been found as statistically insignificant in all three models at 10% level of significance. The variables that positively affect housing prices have been the variables of HSETYPE3, PRPERTY3, HSIZE, BTHRFLR4, HEATSYST1, HEATSYST2, HEATSYST4, HEATSYST5, BNKSERV, CEDUSERV, JAKUZZI, GARDIS, WATTNK, CABCAST, PARKNG, SWPOOL, GNRTOR andTLPHLINE. The variables that negatively affect housing prices have been the variables of HSETYPE1, PRPERTY2, BCONSD, ROMFLR2, ROMFLR3, ROMFLR4, ROMFLR5, ROMFLR6, ROMFLR7, BTHRFLR2, BTHRFLR3, FUEL1, FUEL2, FUEL4, FUEL5, HLTHSERV, NATGAS and ELEVTR.

Table 2: Linear, Logarithmic Linear and Full-Logarithmic Regression Results

	Linear Model		Log - Dog Model		Log - Log Model	
Variables	**Coefficient**	**Standard Error**	**Coefficient**	**Standard Error**	**Coefficient**	**Standard Error**
HSETYPE1	-8292,11***	2619,52	-0,1463***	0,0217	-0,1324***	0,0218
HSETYPE3	38328,53***	11617,05	0,1465***	0,0519	0,1983***	0,0530
HSETYPE4	-4673,11	6880,68	-0,1305	0,0892	-0,1112	0,0867
PRPERTY2	-10696,50***	3925,19	-0,0709**	0,0346	-0,0612*	0,0345
PRPERTY3	4808,27**	1989,29	0,0285*	0,0167	0,0278*	0,0167
BCONSD	-374,47***	82,07	-0,0031***	0,0007	-6,4197***	1,2977
HSIZE	574,33***	68,72	0,0043***	0,0003	0,4810***	0,0284
ROMFLR2	-16956,70***	2009,73	-0,1782***	0,0198	-0,1781***	0,0199
ROMFLR3	-23606,96***	2043,65	-0,2684***	0,0201	-0,2627***	0,0201
ROMFLR4	-11440,76***	1844,13	-0,1189***	0,0168	-0,1163***	0,0167
ROMFLR5	-8129,71	5620,59	-0,0875**	0,0376	-0,0859**	0,0375
ROMFLR6	-7821,63**	3240,06	-0,1396***	0,0411	-0,1334***	0,0413
ROMFLR7	-20000,11***	3889,83	-0,2118***	0,0378	-0,2085***	0,0377
BTHRFLR2	-11463***	3173,66	-0,2676***	0,0425	-0,2618***	0,0426
BTHRFLR3	-4428,36	3160,43	-0,1283***	0,0392	-0,1282***	0,0387
BTHRFLR4	40721,28*	24892,60	0,1432**	0,0610	0,1496**	0,0627
HEATSYST1	13199,83***	4117,61	-0,0599**	0,0288	-0,0544*	0,0289
HEATSYST2	31422,84***	4971,99	0,0885***	0,0275	0,0942***	0,0276
HEATSYST4	9715,94*	5091,67	-0,0423	0,0418	-0,0399	0,0417
HEATSYST5	36112,93*	16873,55	0,1961*	0,1180	0,2024*	0,1172
FUEL1	-38337,79***	5222,67	-0,2235***	0,0397	-0,2330***	0,0401
FUEL2	-49771,03***	5670,73	-0,2795***	0,0365	-0,2854***	0,0369
FUEL4	-23126,74***	5665,63	-0,0019	0,0448	-0,0067	0,0449
FUEL5	-25468,50***	6469,76	-0,1127**	0,0571	-0,1134**	0,0570
BNKSERV	7366,24***	1540,13	0,0514***	0,0113	0,1150***	0,0289
HLTHSERV	-4991,49	3499,27	-0,0035	0,0171	0,0101	0,0426
CEDUSERV	4197,69	2803,36	0,0277*	0,0169	0,0685	0,0446
SAUNA	121264,10	103705,50	0,3544	0,3320	0,4289	0,3599
JAKUZZİ	98900,73***	33283,64	0,3173***	0,0899	0,3460***	0,0935
GARDIS	143108,10	129877,90	0,0532	0,2098	0,1839	0,2857
UNDRHEAT	-13543,55	12471,73	-0,0355	0,0712	-0,0391	0,0720
WATTNK	17851,60***	2481,47	0,1362***	0,0177	0,1398***	0,0178

Table 2: (Continued)

NATGAS	-6351,60*	3561,90	-0,0175	0,0286	-0,0230	0,0289
CABCAST	44325,17***	4773,04	0,3135***	0,0249	0,3143***	0,0250
ELEVTR	-1946,86	2284,08	0,0246	0,0162	0,0305*	0,0162
PARKNG	23984,07***	4727,59	0,1219***	0,0246	0,1315***	0,0248
SWPOOL	144167,50***	40802,40	0,4242***	0,0922	0,4478***	0,0958
GNRTÖR	15519,36	11626,63	-0,0199	0,0572	-0,0224	0,0582
TLPHLINE	10795,78***	1893,84	0,1034***	0,0136	0,1042***	0,0137
Constant	757333***	161903,60	16,9095***	1,3028	57,6855***	9,8518
R^2/flat. R^2	0,5199	0,5148	0,5142	0,509	0,5121	0,5069
Fhes/Prob (Fhes)	101,8917	0.0000	99,572	0.0000	98,7456	0.0000
MSE/ loglikelihood	47774,17	-45204,39	0,3487**	-1334,823**	0,3494	-1342,754

***%1, **%5, *%10 present the levels of significance.

In all three models, R^2 values have been found as very approximate to each other. As a whole, models have been statistically significant. The model that has the lowest mean square error (MSE) value has been noticed as the semi-logarithmic model. Followig formula was used in interpreting this model coefficients (β are coefficients obtained from a semi-log model) : $(e^{\beta}-1)*100$

In Turkish housing market, the variable of house size (HSIZE) can be presented as an example in order to understand interpretations of findings related to regression models established for the houses. For example, the 1 m^2 increase at constructional area of the house has increased house prices for 574,33TL for the linear regression model. In semi-logarithmic regression model, the 1 m^2 increase at constructional area of the house has increased house prices for 43%. For full-logarithmic regression model, the 1 m^2 increase at constructional area of the house has increased house prices for 48,10%. Houses' having swimming pool and jakuzzi have had increasing effect upon the house prices. For example, the cost of building swimming pool has highly affected the price of the house during the sale. The house's having a swimming pool has increased the price of the house as 56,49% more than its not having a swimming pool. Having a jakuzzi in bathroom has also been costly; the house's having a jakuzzi has increased the price of the house as 41,34% more than its not having a jakuzzi. Recently, parking features has become more determinative for house preference gradually. The house's having an autopark has increased the house of the house as 12,19% more. The house's being closer to banking services has increased the price of the house as 12,19% more than its being further. The cost

of going to the bank that has been called as shoe cost have been efficient upon preferring the houses' being close to banking services. Fuel type's being wood and coal has decreased the price of the house in all three types of model. Room floor's being tile has also decreased the price of the house.

CONCLUSION AND SUGGESTIONS

Houses are structures covering a maximum area in the physical structure of cities. With infrastructure works, construction of motorways and bridges, rapid population growth, urbanization, the increase in housing need, urbanization of agricultural and forest land, construcition of multi-storey buildings, construction of villa-style houses, construction of large shopping centers, the city is undergoing a major transformation occurred, qualifications sought and claimed in structures vary. Residences of individuals with physical needs such as shelter, psychological and social needs meet together has become a consumer good.

The factors that affect house prices are very complex. House prices are closely related to residential properties. Many features such as comfort that it provides to its users, proximity to business centers and to areas of social reinforcement, quality of local services, infrastructure facilities, impurity, noise, the amount of tax are determining factor in the value of house prices. There are different features of each house, so house is a heterogeneous commodity and house market is a heterogeneous market. Because of heterogeneity hedonic price model is used to determine the effect of different characteristics on house prices.

The purpose of this study is to determine tha factors that affect housing prices in Turkey. For this reason, TSI Houselhold Budget Survey 2010 data have been used. There have been established three different models experimenting three different function types as linear, semi-logarithmic and full-logarithmic.

Five of 45 variables included in regression models (HSETYPE4, HLTHSERV, SAUNA, UNDRHEAT, GNRTOR) have not been found as statistically significant in none of the models. Coefficient indicators of the variables have been in accordance with the theoretical expectations. Houses' having swimming pool, jakuzzi and water tank, the houses' being duplex flat, those's having central heating system, size of the house, batroom floor's being vinyl or PVC, its being closer to banking and compulsory education services, houses' having cable cast, telephone line and parking area have increased the value of the houses. The house's being on ground or basement floor, construction year of the building, bathroom floor's being cement finish and used fuel's being coal have had decreasing effect upon the value of the house.

Majority of the studies carried out previously on this subject have included urban areas. In the study in which determinatives of housing prices in turkey has

been specified and carried out by Selim in 2008, there have been used 2004 Household Budget Survey. According to the aforementioned study, the most important variables that affect house prices have been the type of house, the type of structure, number of rooms, size of the house, and the house's having water tank, swimming pool and natural gas.

This study has been used more variables from previous studies. Whereas earlier studies focused on house properties related to the the environment or transformation. In this study in which 2010 Household Budget Survey micro data set and one dependent and 45 independent variables have been used have had similar results to the one that has been carried out by Selim (2008). The survey is more recent used in this study than the survey used in the study Selim (2008) made on this subject. In this study, as well, there have been brought more house characterisitics to the forefront. With this study, there has been precipitated that the variables such as house's being duplex, central heating system, bathroom floor's being vinyl or PVC, its being closer to banking and compulsory education services, its having cable cast, telephone line and parking area, the house's being on basement or ground floor, construction year of the building, room floor's being tile, bathroom's being cement finish and fuel's being coal have affected the value of the house.

Studies on this subject can be varied in the number of variables. Because the factors that affect house prices are increasing over time. This study has been considered as a set of information for both producers and consumers. There can be said that producers' making their plans considering the factors that have been efficient or not upon the house prices has been highly important for their efficient use of their sources.

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