Hedonic Price Mmethod for Housing

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ABSTRACT

Hedonic goods are analyzed by "Hedonic price model" and it makes possible to compute the adequacy of price indices in the commodity markets. Hedonic goods involve immovable properties, such as apartment, computers, cars, home things, mobile phones etc. The features of these goods form their prices.Marginal effects of features of goods in forming the prices of hedonic goods can be determined by this approach. In other words, the parameters obtained from estimating the hedonic price model describes the marginal value of characteristics of goods. This method creates wide opportunities for analyzing the quality changes on behavior and pleasure of people.

Introduction

Real estate market, in particular housing market, has a big importance in economic and social area. From the end of previous century till now the housing market has been developing in Azerbaijan, especially in Baku city. The development of housing market is explained by several factors: accelerated urbanization process, increasing investment in houses, real estate direction of funds earned abroad by residents etc.

As heterogeneous goods a house has three major peculiarities unlike other goods. First, it includes many other goods and meets different requirements of the family. Second, the house is immovable. That is why the location of house is playing very important role in forming its price. Third, the demand in the housing market is more stable than in the market of other goods, which could be explained by the fact that a house cannot be substituted by other goods.

The characteristics of houses generate their prices. Hedonic price method helps in defining the influence of these characteristics which are given in the table 1 on the price of houses.

First section of working paper has been devoted to literatures about hedonic price method. The second section describes statistic analysis of data. The last section is about practical implementation of hedonic price method on the housing market.

Literature Review

Colwell and Dilmore noted that the word "hedonic" was used first time by Haas in 1922. In his research called "*A Statistical Analysis Of Form Sales In Blue Earth County, Minnesota, As A Basis For Farmland Appraisal"* a simple hedonic price model was constructed. In this model the factors like "far from the city center" and "scale of the city" have been used as the explanatory variable (Ercan BALDEMİR, 24-25 Mayıs 2007).

Timothy J. Bartik from the university of Vanderbilt, states that the theory of hedonic price for the first time was contributed by Court in 1941 (Bartik, 1987).

A. T. Court analyzed the price of automobiles as a function of their characteristics in his research work which called "Hedonic Price Indexes with Automotive Examples" and had defined the marginal cost of each characteristic. In this work he explained that the marginal cost of the characteristics generates the prices of automobiles (A.T.COURT, 1939).

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In 1951 Tinbergen has also used hedonic price method. He considered salary as a hedonic function of the distribution of employees and analyzed the utility and production functions of the companies (Bartik, 1987). Zvi Griliches has investigated the importance of the characteristics of automobiles in his research work *"Hedonic Price Indexes for Automobiles: An Econometric Analysis of Quality Change"* in 1961. In 1967 Ronald G. Ridker and John A. Henning learned the influence of the characteristics of housing to the market price by the hedonic price method (Bartik, 1987). The basic of theory of the hedonic price method are Lancaster's Consumer Theory and Rosen's model (Ronald G. Ridker).

Lately some research works about hedonic price method were constructed that we will be able to hold up as an example as follows;

Timothy J. Bartik (1987) "*The Estimation of Demand Parameters in Hedonic Price Models",* Ariel P. (2003) *"A Reconsideration of Hedonic Price Indexes with an Application to PC's.",* Erwin Diewert (2003) *"Hedonic Regressions A Consumer Theory Approach",* David H. Good, Robin C. Sickles (2005) *"A Hedonic Price Index for Airline Travel",* Uğur Yankaya, H. Murat Çelik (2005) *"İzmir Metrosunun Konut Fiyatlari Üzerindeki Etkilerinin Hedonik Fiyat Yöntemi ile Modellenmesi",* Ercan Baldemir, C.Yenal Kesbiç və Mustafa İnci (2007) *"Emlak Piyasasinda Hedonik Talep Parametlerinin Tahminlenmesi (Muğla örneği)"*, Robert J. Hill, Daniel Melser (2008) *"Hedonic Price Indexes for Housing Across Regions and Time: The Problem of Substitution Bias",* Shanaka Herath, Gunther Maier (2010) *"The Hedonic Price Method in Real Estate and Housing Market Research: A Review of the Literature".*

2. Theory of Hedonic Price Method.

As a basis of hedonic price method, we can discuss Lancaster's (1966) Consumer Theory. He denoted that, the demands of consumers don't create the goods, it create the characteristics of the goods. He has an opinion that, each goods are perceived as the total of their characteristics. Moreover, in accordance with Lancaster's Consumer Theory each of the characteristics of the heterogeneous goods is consumers' utility function of the respective variables (Ercan BALDEMİR, 24-25 Mayıs 2007). So, the level of consumer's utility will depend on marginal cost of the characteristics of the goods.

We continue our discussion about hedonic method theory with the explanation of American economist S. Rosen's theory which he put forward in 1974. Rosen improved Lancaster's Consumer Theory and included the utility category into this theory. So, for the first time equilibrium in demand - supply of hedonic market was theoretically analyzed. In Rosen's model the hedonic goods (Z) have been analyzed as the total of their characteristics (Z_i) in the n numbers. It was defined as the following (Rosen, 1974);

$$Z = (Z_1, Z_2, \dots, Z_n) \tag{2.1}$$

Where, Z-hedonic goods, Z_i- the characteristics of this goods.

Thus, the price of goods $p(z)$ is defined as the following function;

$$p(Z) = p(Z_1, Z_2, \dots, Z_n) \tag{2.2}$$

Rosen thought that, the characteristics of the hedonic goods are the variables which participate in demand and supply equations. Mathematically, the demand-supply equilibrium is shown as the following (Rosen, 1974):

$$\begin{cases} p_t(Z) = F^t(Z_1, Z_2, \dots, Z_n, Y_1) \quad (demand) & (2.3) \\ p_t(Z) = G^t(Z_1, Z_2, \dots, Z_n, Y_2) \quad (supply) & (2.4) \end{cases}$$

In his research, Rosen offered two steps for resolving of (2.3)-(2.4) equations system which is known as the demand-supply equilibrium. First, the function $p\ (Z)$ is estimated by hedonic price method. Here Y_1 and Y_2

are excluded, because they are exogenous variables. Second, the marginal costs ($\partial p(Z) / \partial Z_i = \hat{p}_i(Z)$)

are calculated and these marginal costs are taken into account as the endogenous variables in (2.3)-(2.4) equations system.

3. Hedonic Price Index for Housing

Hedonic price index is calculated based on two methods: The Dummy Variable Method and The Characteristics Price Method.

3.1. The Dummy Variable Method

The time dummy variable (*D*) is very important when we use dummy variable method for calculating the hedonic price index. *D* equals 1 for each dwelling *i* wherein the price of dwelling *i* must be observed in 2011. *D* equal 0 for each dwelling *i* wherein the price of dwelling *i* must be observed in 2010. So we have two periods - 2010 and 2011. And we want to know how change is observed in price of the characteristics of housing in 2011 in comparison with 2010. Thus, the year of 2010 is base that is why D equals to 0 for each *i* dwelling where the price of *i* dwelling is observed.

The coefficient of the time dummy variable(β_D) shows the percentage change of housing prices in 2011 in comparison with 2010. For applying this method we should get the data of these periods and estimate hedonic price model for 2010 and 2011 together. The hedonic price model is estimated as following (*see: table 1*).

Table 1: Hedonic Price Model.

Explanatory variables	Coefficient	Standard error	t-Statistic	Prob.
German project	0.1844	0.0946	1.9486	0.0519
Ground floor	0.0590	0.0249	2.3676	0.0183
D	-0.0613	0.0256	-2.3972	0.0169
Eks.Khrush. project	-0.4219	0.2362	-1.7865	0.0747
Excellent repair	0.1725	0.0288	5.9933	0.0000
French project	0.1040	0.0552	1.8854	0.0600
Italy project	-0.2539	0.1409	-1.8016	0.0723
Kiev project	0.1798	0.0396	4.5388	0.0000
Leningrad project	0.2445	0.0366	6.6737	0.0000
Far from the city center	-0.3977	0.0316	-12.5726	0.0000
Metro station	0.0719	0.0299	2.4040	0.0166
Micro region	0.1916	0.0359	5.3416	0.0000
Minsk project	0.2774	0.0524	5.2906	0.0000
Stalin project	0.2671	0.0572	4.6738	0.0000
Without repair	-0.2418	0.0361	-6.7052	0.0000
Khrushov project	0.2369	0.0411	5.7643	0.0000
C	6.9588	0.0492	141.5072	0.0000

In the hedonic model (*see: table 1*), coefficients of explanatory variables are significant at the 0.05 confidence level. We know that the error term of regression, where cross-sectional data is used, usually has heteroskedasticity problem. Our model has heteroskedasticity problem too. In this case we can't explain the coefficients of explanatory variables and can't use the coefficient of the time dummy variable.

In regression (*see: table 1*) the coefficient of explanatory variables has been significant at 95% confidence level. Moreover, other tests were significant which explain the correctness of model. There are heteroskedasticity in similar to all of the cross-sectional data and this model has the problem as well. In this case the coefficients of explanatory variables and the time dummy variable (D1) will not be significant.

3.1.1. The Heteroskedasticity of The Model

Now we try to define the heteroskedasticity of the model with Breusch–Pagan–Godfrey test. As the critic value approach, if value of $n*R^2$ (n is a number of observation) greater than the critic value of Chi-Square in 5 percent significant level, error terms of the model has the heteroskedasticity problem. As the p-value approach, if both the value of F-statistics and the value of Chi-Square test statistics less than 0.05, error terms of the model has the heteroskedasticity problem. In this case $n*R^2$ = 35.28 (*see: table 2*). However, the critic value of Chi-Square test statistics equals 26.30 with 16 degree of freedom and 5 percent significant level. So, the model has heteroskedasticity because 35.28 > 26.30. At the same time, for p-value approach the probability of Chi-Square test less than 0.05 (*see: table 2*). It shows that the model has heteroskedasticity problemtoo.

The result of *Breusch–Pagan–Godfrey* test is as follows (*see: table 2*):

Table 2: The Heteroskedasticity of The Model: Breusch–Pagan–Godfrey Test.

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	2.294972	Prob. F(16,467)	0.0030
Obs*R-squared	35.28205	Prob. Chi- Square(16)	0.0036

3.1.1. a. The Procedure to Correct for Heteroskedasticity

Usually, we can't define the reason for the heteroskedasticity of the model. In this case we can solve this problem as the following:

Assume that, the given regression has heteroskedasticity. Then the results of the model will change as the proportion to the changes on explanatory variables. From this idea we can write equation as follows (Wooldridge):

$$var(u|x) = \sigma^2 exp(\delta_0 + \delta_1 X_1 + \delta_2 X_2 + \dots + \delta_k X_k) \text{ Or } var(u|x) = \sigma^2 h(x) \qquad (3.1)$$

Where, $x_1, x_2,...,x_k$ the explanatory variables of the first model which has heteroskedasticity,

$h(x) = exp(\delta_0 + \delta_1 X_1 + \delta_2 X_2 + \dots + \delta_k X_k)$ is the function which depending on $x_1, x_2,..., x_k$ variables. δ_t $(t = 1 \dots k)$ are unknown parameters.

You can question as to why we used exponential form in (3.1). We know from theory of heteroskedasticity that the dependence of residuals of model is assumed as linear and such as assumption will be useful for the heteroskedasticity test. However, if we use WLS (Weighted Least Squares) for correcting the problem of heteroskedasticity, this assumption can face a problem. Because, linear models do not ensure that predicted values are positive, and our estimated variances must be positive in order to perform WLS. That is why, we assume that (3.1) as the exponential function (Wooldridge).

If $\delta_t (t = 1 \dots k)$ are the known parameters, then the applying of WLS is easy. But this situation is rarely possible. In this case it is best to estimate this parameters and then to use these estimates as the weights. And how can we estimate these parameters? It is as follows (Wooldridge):

$$u^2 = \sigma^2 exp(\delta_0 + \delta_1 X_1 + \delta_2 X_2 + \dots + \delta_k X_k)v \qquad (3.2)$$

Where If we assume that v is actually independent of $\boldsymbol{x}$, v has a mean equal to unity, conditional on $\boldsymbol{x}=(x_1, x_2,...,x_k)$ then the (3.2) model will be as follows (Wooldridge).

$$\ln(u^2) = \alpha_0 + \delta_1 X_1 + \delta_2 X_2 + \dots + \delta_k X_k + e \qquad (3.3)$$

Where, *e* has a zero mean and it is independent from $x_1, x_2, \ldots, x_k$. α_0 and δ_0 aren't equal. But it is not important (Wooldridge). Since the Gauss-Markov terms are provided in (3.3) model, then we can estimate unbiased parameters $\delta_i \ (i = 1 \ldots k)$ by using OLS (Ordinary Least Squares).

The procedure to correct the heteroskedasticity consists of 5 steps which were given as Follows (Wooldridge):

Step 1: The variable *y* take as the function of the variables $x_1, x_2, \ldots, x_k$ and this dependence is estimated by using OLS. After that we can get $\hat{u}$ residuals.

$$y_i = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \cdots + \beta_k X_{ik} + \hat{u}_i$$

Step 2: $\ln(\hat{u}_i^{\,2})$ are calculated.

Step 3: $\ln(u^2)$ is taken as the function of variables $x_1, x_2, \ldots, x_k$ and this dependence is estimated by using OLS. After that we obtain the fitted values, $\hat{g}_i$:

$$\ln(\hat{u}_i^2) = \underbrace{\alpha_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \cdots + \beta_k X_{ik}}_{\hat{g}_i} + e_i.$$

Step 4: In this step, $\hat{h}_i = \exp(\hat{g}_i)$ are defined.

Step 5: In final step, the heteroskedasticity is corrected as the following:

$$\sum_{i=1}^{n} (\hat{y}_i - \beta_0 - \beta_1 X_{i1} - \beta_2 X_{i2} - \cdots - \beta_k X_{ik})^2 / \hat{h}_i.$$

Where, *n* is a number of observation, *k* is a number of explanatory variables.

We tried to correct heteroskedasticity problem of our hedonic regression model (*see: table 1*) by using the steps mentioned above and had got new regression model (*see: table 3*). But we couldn't correct the heteroskedasticity in our hedonic model.

Table 3: New hedonic regression after 5 steps.

Explanatory variables	Coefficient	Stand.error	t-Statistic	Prob.
German project	0.095722	0.250764	0.381722	0.7028
Ground floor	0.139879	0.036096	3.875153	0.0001
D	-0.01263	0.018086	-0.6985	0.4852
Eks.Khrush. project	0.156822	0.768257	0.204127	0.8383
Excellent repair	0.011398	0.028071	0.406054	0.6849
French project	0.268705	0.083371	3.22302	0.0014
Italy project	-0.1132	0.457864	-0.24723	0.8048
Kiev project	0.034019	0.030048	1.132154	0.2582
Leningrad project	-0.01177	0.031318	-0.37581	0.7072
Far from the city center	0.093677	0.029284	3.198901	0.0015
Metro station	0.0803	0.021525	3.730534	0.0002
Micro region	-0.02332	0.020537	-1.1355	0.2567
Minsk project	0.025682	0.040899	0.627938	0.5304
Stalin project	0.007599	0.042377	0.179322	0.8578
Without repair	-0.07369	0.024701	-2.98331	0.003
Khrushov project	0.121975	0.045176	2.70002	0.0072
C	6.484032	0.039731	163.1982	0

So, the calculating of hedonic price index for housing by using dummy variable method was not possible. Next, we will try to calculate the hedonic price index for housing by using characteristics method.

3.2. The Characteristics Price Method.
As it is said above, estimation of the hedonic regression model for each period is a mean part of the calculating of the hedonic price index by using characteristics method. We want to define the hedonic price index for 2010 and 2011 periods. The hedonic regression models for these periods are as the following:

For 2010:
ln(price per kv.m.) = 10.99 + 0.25*Germany project + 0.14*excellent repair + 0.13*kiev project - 0.29*far from the city center + 0.31*leningrad project + 0.35*stalin project - 0.59*ln(budget expenses) - 0.41*without repair + 0.17*khrushov project (3.4)

For 2011:
ln(price per kv.m.) = 7.05 + 0.12*ground floor - 0.57*eks.xurush. project + 0.10*excellent repair + 0.20*two balcony - 0.43*italy project + 0.08*kiev project + 0.16*leningrad project - 0.50*far from the city center + 0.06*metro station + 0.14* micro region + 0.31*minsk project + 0.17*stalin project - 0.23* without repair + 0.25* khrushov project (3.5)

AR (Autoregression) (5)=0.84,
MA (Moving average) (5)= -0.98,

Hedonic price index:

Laspeyres rule ($I^L_{2010,2011}$) (Triplett, 2004),

$$I^L_{2010,2011} = \sum_{j=1}^{k} \beta_{j,2011} \bar{X}_{j,2010} / \sum_{j=1}^{k} \beta_{j,2010} \bar{X}_{j,2010} \qquad (3.6)$$

Where, $I^L_{\tau,\tau+1}$ is the Laspeyres index for 2010 and 2011 periods, $\beta_{j,2011}$ is coefficient of *j* characteristic in 2011, $\beta_{j,2010}$ is coefficient of *j* characteristic in 2010, $\bar{X}_{j,2010}$ is a average of the value of *j* characteristic (Triplett, 2004).

So, we need $\beta_{j,2010}$, $\beta_{j,2011}$ and $\bar{X}_{j,2010}$ for calculating of the hedonic price index. We can take $\beta_{j,2010}$ and $\beta_{j,2011}$ from (3.4) and (3.5) respectively. $\bar{X}_{j,2010}$ are defined with the equation as follows (Triplett, 2004):

$$\bar{X}_{j,2010} = \frac{1}{H_{2010}} \sum_{h=1}^{H_{2010}} X_{j,2010,h} \qquad (3.7)$$

Where, H_{2010} the total number of flats in 2010, $X_{j,2010,h}$ is the value of *j* characteristic of *h* flat in 2010.

We have 195 observations in 2010. That is why, h=1....195 and H_{2010}=195. Now we can calculate $\bar{X}_{j,2010}$ as the following:

$$\bar{X}_{\text{excellent repair},2010} = \frac{1}{195} \sum_{h=1}^{H_{195}} X_{\text{excellent repair},2010,h} = \frac{1}{195} * 45 = 0.23$$

$$\bar{X}_{\text{kiev project},2010} = \frac{1}{195} \sum_{h=1}^{H_{195}} X_{\text{kiev project},2010,h} = \frac{1}{195} * 23 = 0.12$$

$$\bar{X}_{\text{far from the city centre},2010} = \frac{1}{195} \sum_{h=1}^{H_{195}} X_{\text{far from the city centre},2010,h} = \frac{1}{195} * 152 = 0.77$$

$$\bar{X}_{leningrad\ project,2010} = \frac{1}{195}\sum_{h=1}^{N_{195}} X_{leningrad\ project,2010,h} = \frac{1}{195} * 40 = 0.21$$

$$\bar{X}_{stalin\ project,2010} = \frac{1}{195}\sum_{h=1}^{N_{195}} X_{stalin\ project,2010,h} = \frac{1}{195} * 2 = 0.01$$

$$\bar{X}_{without\ repair,2010} = \frac{1}{195}\sum_{h=1}^{N_{195}} X_{without\ repair,2010,h} = \frac{1}{195} * 38 = 0.20$$

$$\bar{X}_{xrushov\ project,2010} = \frac{1}{195}\sum_{h=1}^{N_{195}} X_{xrushov\ project,2010,h} = \frac{1}{195} * 46 = 0.24$$

If we take into consideration these mean values and $\beta_{j,2010}$ and $\beta_{j,2011}$ (*see: equations (3.4) and (3.5)*) on (3.6), then, we can get hedonic price indexes as the following:

$$I^L_{2010,2011,excellent\ repair} = \frac{0.1 * 0.23}{0.14 * 0.23} = 0.71$$

$$I^L_{2010,2011,kiev\ project} = \frac{0.08 * 0.12}{0.13 * 0.12} = 0.61$$

$$I^L_{2010,2011,far\ from\ the\ city\ centre} = \frac{0.50 * 0.77}{0.29 * 0.77} = 1.72$$

$$I^L_{2010,2011,leningrad\ project} = \frac{0.16 * 0.21}{0.31 * 0.21} = 0.52$$

$$I^L_{2010,2011,stalin\ project} = \frac{0.17 * 0.01}{0.35 * 0.01} = 0.49$$

$$I^L_{2010,2011,without\ repair} = \frac{0.23 * 0.20}{0.41 * 0.20} = 0.56$$

$$I^L_{2010,2011,xrushov\ project} = \frac{0.25 * 0.24}{0.17 * 0.24} = 1.47$$

So, we can say that the price of characteristics “far from the city center” and “Khrushov project” have increased 72% and 47% respectively in 2011 relative to 2010. In reality people prefer to “Leningrad” project and “Kiev” project than “Khrushov” project. One question appears. Why did happen the decrease in the price of Leningrad and Kiev projects in 2011 in comparison with 2010? The reason is consumers can’t buy the flat which is located in the center of the city and has better project (than Khrushov project one). In result, consumers choose the flat with location in the center of city, but has worse project (than Leningrad and Kiev project) or choose the flat which has better project (than Khrushov project), and located far from the center of the city.

The subway is a very important transportation mean in Baku. During the next 20 years building of the metro stations are planned in the most part of the city. Denote that, in hedonic regression model for 2011 coefficient of the metro station factor was significant. So, we can define that, what will happen in price of housing if new metro station is built in any part of the city. For example, assume that new metro station is built in Yeni Gunashli (the far region of Baku). Take into consideration that, if any characteristic appears we have classified 1 or if the same characteristic doesn’t appear we have classified 0.

If hedonic model is a semilog model, i.e. (Coulson)

$$lnP = a_0 + a_1X_1 + a_2X_2 + \dots + a_kX_k + e \qquad (3.8)$$

Then, (Coulson)

$$\frac{\partial P}{\partial X_j} = a_j e^{a_0 + a_1X_1 + a_2X_2 + \dots + a_kX_k + e} = a_jP \qquad (3.9)$$

For the equation in (3.9), hedonic price of any characteristic equals the change in price of housing because the unite change in X (Coulson).

For characteristics with binary measures the situation is a bit different. As Halvorsen and Palmquist (1980) point out, if X is a dummy variable (or other discretely measured attribute) care must be taken (Coulson). For small values of a_j the "percentage" interpretation is valid (as this is the same as assuming that *ln(1+a)=a*, a well-known approximation for small a), but if a_j is large then the actual discrete difference should be calculated. That is, if X_1 is a characteristic (like a metro station) that only takes on a value of 1 if the house has a pool, and zero otherwise, then you can't really take the derivative of price with respect to X_1 (Coulson). In this case the change of price will be as the following (Coulson):

$$\Delta P = \left[\underbrace{e^{a_0+a_1+a_2X_2+\dots+a_kX_k+e}}_{X_1=1} - \underbrace{e^{a_0+a_2X_2+\dots+a_kX_k+e}}_{X_1=0} \right] / \underbrace{e^{a_0+a_2X_2+\dots+a_kX_k+e}}_{X_1=0}$$

Let's go back to sample of Yeni Gunashli. We assumed change in housing prices in the case if the new metro station is built in Yeni Gunashli.

So, the price of housing (on the basis of the following characteristics) has formed before building of new metro station in Yeni Gunashli is as follows:

Ground floor =1
Excellent repair =1
Kiev project =1
Far from the city center =1

eks.khrush. project =0
two balcony =0
Italy project =0
Leningrad project =0
Metro station =0
Micro region =0
Minsk project =0
Stalin project =0
Without repair =0
Khrushov project =0

P_i - e_i = exp(7.05+0.12*1-0.57*0+0.1*1+0.2*0-0.43*0+0.08*1+0.16*0-0.5*1+0.06*0+0.14*0+0.31*0+0.17*0-0.23*0+0.25*0) = 943.88

Where, P_i is the price of the housing which is assumed, e_i is an error term (excluded variables included).

The price of the housing (on the basis of the following characteristics) formed after a new metro station in Yeni Gunashli is built as the following:

Ground floor =1
Excellent repair =1
Kiev project =1
Far from the city center =1
Metro station =1

eks.khrush. project =0
two balcony =0
Italy project =0
Leningrad project =0
micro region =0
Minsk project =0
Stalin project =0
Without repair =0
khrushov project =0

P_i - e_i = exp(7.05+0.12*1-0.57*0+0.1*1+0.2*0-0.43*0+0.08*1+0.16*0-0.5*1+0.06*1+0.14*0+0.31*0+0.17*0-0.23*0+0.25*0) = 1002.247

Where, P_i is the price of housing which is assumed, e_i is an error term (excluded variables included).

So, after a new metro station is built we can calculate the change in price of flats which are located on the ground floor of any building, with excellent repair and "Kiev" project:

$$\Delta P_t = \frac{1002.247 - 943.88}{943.88} * 100 = 6.18\%$$

It means that, after building of new metro station in Yeni Gunashli, the price of the flat with above mentioned terms will increase by 6.18%.

Conclusion

In this paper hedonic price index have been computed for the characteristics of houses in Baku, Azerbaijan. The characteristics - "Germany project", "Excellent repair", "Kiev project", "Leningrad project", "Stalin project", "Khrushov project", "Ground floor", "Two balcony", "Metro station", "Micro region", "Minsk project" were defined as the raising factor on the price of houses and the characteristics - "Without repair", "Italy project", "Far from the city center", "Eks.khrush. project" were determined as the reducing factor on the price of houses during the years 2010 and 2011. This method provided to calculate the change of the price of each characteristic of houses in 2011 relative to 2010.

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