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DETERMINANT OF HOUSING RENTS IN URBAN ALBANIA: AN EMPIRICAL HEDONIC PRICE APPLICATION WITH NSA SURVEY DATA*

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Abstract

As an immobile, durable and heterogonous good, each housing unit has a bundle of different characteristics. Hedonic price method, which depends on the consumer theory of the classical economics, implies that each characteristic of heterogeneous goods provides a different level of satisfaction or utility to the consumer, being widely accepted as a toolkit for estimating effects of these characteristics on prices and rents. HPM expresses housing prices as the function of structural characteristics, location characteristics, and neighborhood characteristics. Theory and empirical applications of the HPM, which have been used for more than 40 years in developed countries, due to the lack of suitable data related literature is limited in Albania. The aim of this paper is to analyze the relationship between housing rents and housing characteristics in urban Albania with micro database of Living Conditions and Income Survey 2012.

Keywords: Real Estate Market in Albania, Hedonic Price Model, Public Good Accessibility, Regional Differentiation in Housing Market

JEL: R21, R23, R41

1. Introduction

During the communist period, the real estate market was inexistent as was the state who reallocated people into living houses. According to Kripa *et al.* (2014), following the privatization process and reforms in 1991, the real estate market faced tremendous changes. In 1994, the era of new apartment construction begun, bringing a rise in the real estate market. With the collapse of cooperatives, the agricultural sector after 90's faced several problems. Therefore, a period of internal migration from rural areas toward the capital, Tirana (along with the other urban areas) begun. As a result of this demographic structure change, both housing demand and housing prices boosted in Tirana. The construction sector in the following years had been one of the main contributors of the economic growth. The average sectoral growth rate reached 19% yearly for the period 99-08. Shahini (2014) divides the changes in the dwelling market (parallelizing with the housing loan market) into two periods, 2000-07 and 08-13. While the dwelling market rising very fast during the first period, it slowed down due to the global financial

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crisis in the second one. This phenomenon can be seen in Figure 1, where is clearly shown in terms of the number of dwellings built during the period and their respective values.

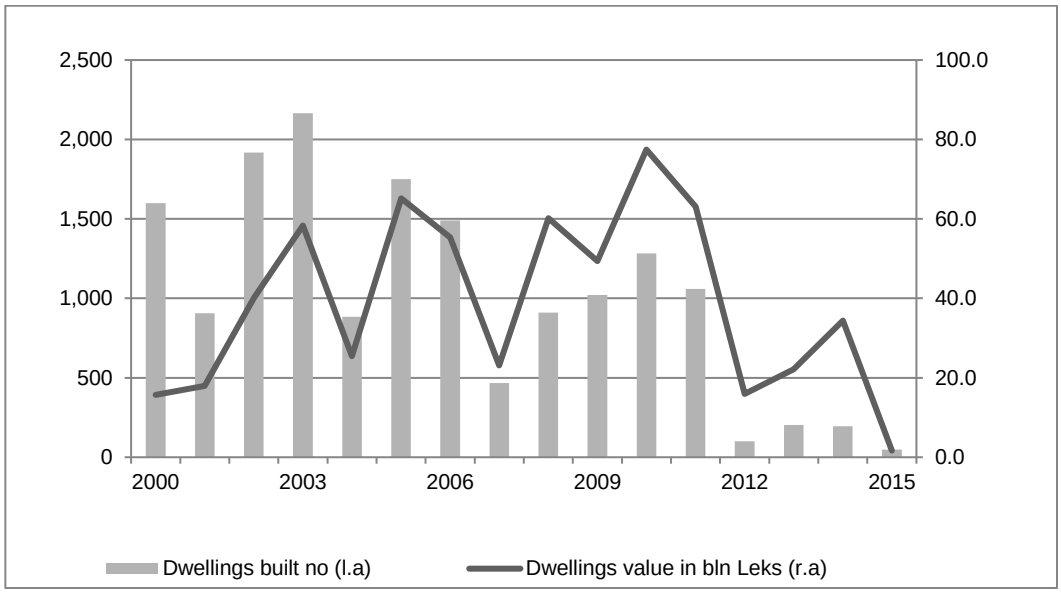

Figure 1. Dwelling activity in Albania
Source: Instat (2016a)

During the last 25 years, Albanian cities have gone through a rapid social and economic transformation. Bertaud (2006) argues that the spatial transformation of Albanian cities under the pressure of unpredictable political events and economic changes has not been following a smoothly planned transition path. However, the outcome of this apparently chaotic process is rather positive. The characteristics of Albanian houses have changed, such as floor area, number of rooms, quality of construction material and the neighborhood characteristics. As it is shown in Figure 2, residential dwelling construction activity has remained the core of the real estate market in Albania during the last 10 years. 60% of the construction activity has been composed of dwelling construction per year.

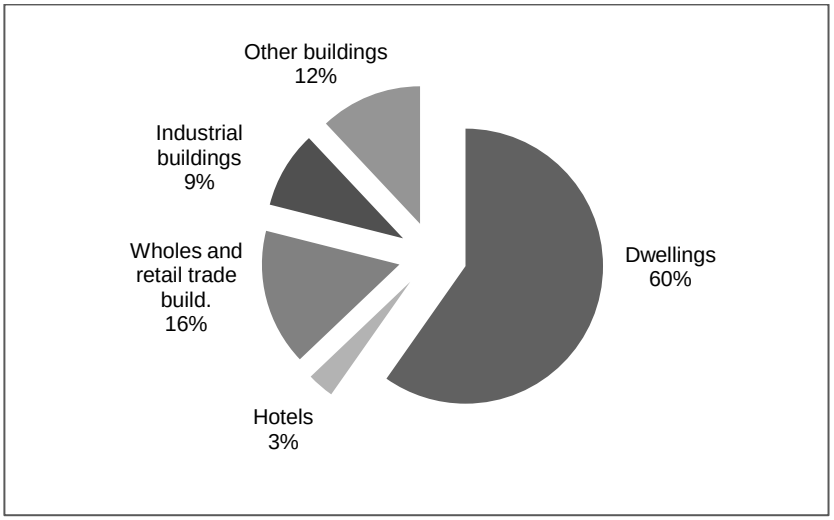

Figure 2. Dwelling share over construction activity in Albania (as last 10 years average)
Source: Instat (2016a)

In contrast to high market share and crucial economic contribution, housing market still encounters many problems, such as the difficulty of getting a construction permit, issues regarding property rights of an old building or of the land of the new buildings, the high informality of the market that might disrupt market prices.

In a highly unequal manner, the development of Albanian real estate market has been concentrated on the center of the country, where the capital Tirana is located, and on the main coastal cities due to the tourism issues. On the other hand, the progress of the other regions has been lagging behind. There is almost no housing market in rural Albania; therefore, this study focuses on urban Albania. In general, to rent an average house in Albania, a family needs to spend at least one third or quarter of their monthly income. As it is seen in the upward part of Figure 3, Tirana is the most expensive city in urban Albania in terms of rent, standing much higher than the total of the country. The most developed prefectures of the country are Tirana (economic activity here is high due to strong agglomeration forces), Fier (due to its high trade activity and oil sector) and Vlore (due to tourism reasons, as there is high demand for houses in the seaside).

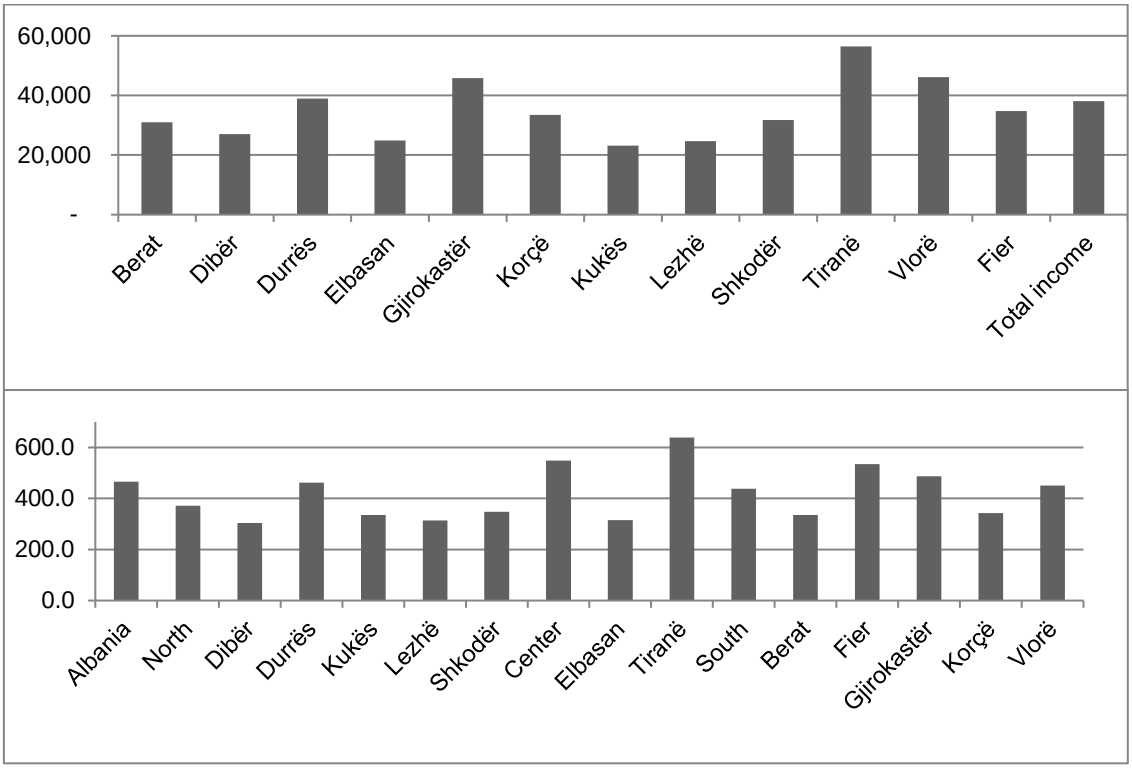

Figure 3. Monthly income per prefectures for 2007 (upward) and GDP per capita in Leks for 2014 (downward)

Source: Instat (2016b)

The downward part of Figure 3 presents the regional differences in terms of GDP per capita. In comparison to upward part of Figure 3, regional differences decrease in part due to the population weighting, but it still remains. The North region is the one where the economic activity is the lowest. In parallel with this poor performance, housing market also shows lower activity. According to Instat (2016b), together with 6.5% increase per year, Tirana by itself took 49.9% of the total construction activity in 2014. High demand for houses in Tirana causes an increase on prices.

The aim of this paper is to analyze the impacts of housing characteristics and housing rent nexus using Albania National Statistics Institute micro data (Instat, 2013). In response to

research, target hedonic price method, which is widely accepted as a toolkit for estimating effects of housing characteristics on prices and rents, is implemented.

The outline of this is paper as followed. Section 2 provides the theoretical hedonic model framework and findings of related literature. Thereinafter, the structure of data set and empirical model are described. And then in the line with the literature, the models are estimated in semi-log form. The empirical results are summarized in the subsequent section of the study, and overall empirical results are interpreted and regression diagnostics are discussed. The conclusion provides a short summary of the results and discusses the dynamics of Albanian housing market.

2. Hedonic Price Model

As an immobile, durable and heterogonous good, each housing unit has a bundle of different characteristics such as size, age, view, recreational facilities and location. Hedonic price method, which depends on the consumer theory of the classical economics, implies that each of the characteristics of heterogeneous goods provides a different level of satisfaction or utility for the consumer and it is widely accepted toolkit for estimating effects of these characteristics on prices and rents. In related literature, Lancaster (1966) and Rosen (1974) were widely cited papers on theoretical framework of markets for differentiated products. Focusing on microeconomic foundations, Lancaster (1966) has explored the utility function of "goods" with respect to individual characteristics. As an impressive microeconomic theoretical discussion, Lancaster's theoretical model was not developed for housing market specifically, but became one of the most important cornerstones in housing market literature. The other seminal paper of literature, Rosen (1974), gave a stylized model of both supply and demand side of market starting from bid and offer curve for characteristics of goods.

According to Rosen's model, various characteristics are included by heterogeneous goods and the utility functions of these goods are defined by the characteristics. These characteristics are not explicitly traded on markets. However, the implicit marginal prices of these characteristics can be revealed by hedonic regressions (Palmquist, 1984). Under the perfect competition market conditions, with maximizing consumer's utility and producer's profit as the goal, Rosen (1974) analyzed theoretically the long term and short-term equilibrium of the heterogeneous goods market.

Rosen's model defines the goods (*Z)* as the total of their *n* characteristics (Z_i). *I* comprises *n* characteristics and expresses the quantity of each characteristic. In this context, Rosen's model can be formulated as follows (Rosen, 1974):

$$Z= f(Z_i) \ (i=1,2,3 \ldots n) \tag{1}$$

Heterogonous goods are described by numerical values of *Z* and provide the consumers with different packages of characteristics. In addition to this, existence of product differentiation enabled by the presence of diverse characteristics implies that a wide variety of alternative combination is available. The demand function can be described as function of price and quantity of characteristics as equation 2:

$$P(z)= p(z_1, z_2, z_3,.....z_n) \tag{2}$$

There is no obligation for linearity of price model, because differentiated goods are related with each goods but they are sold in different markets. Because of indivisibility assumption, arbitrage is impossible in Rosen model. So, hedonic price function p(z) is non-linear and marginal prices are not constant. We can write effect of each characteristic on prices as below:

$$\partial p/\partial zi = pi \tag{3}$$

Although Rosen's model works within demand and supply side of market, common usage of hedonic price models in real estate market assumes that supply of housing characteristics is

fixed in at any given time and is independent of the implicit price of each characteristics (Zietz *et al.* 2007). Key assumptions of hedonic housing price models are identical consumers, perfect information, zero transaction costs and market equilibrium. However, in real world, it is not easy to satisfy these conditions at the same time.

Hedonic price method has some risks and disadvantages. Useful technical note of Gundimeda (2005) lists theoretical and estimation issues of HPM estimations such as:

- The hedonic price method is very data intensive and estimating HPM necessitates large sample which captures selling prices and wide range characteristics of goods in that market.
- Perfect information is one of the key assumptions for hedonic price models. If the market contributors are not informed about the values and characteristics of all the properties in the market, then it is possible that the prices and the implicit prices will become different for each sale.
- Transaction costs are omitted in the model, but in real world, transaction costs in the real estate market are varied and cannot be ignored.
- Main problem with the estimation procedure is multicollinearity. Frequently, housing characteristics will be collinear such as environmental characteristics and accessibility, age and construction material. As a result of collinearity, it is not easy to separate independent effect of each characteristic on the price.
- All the above factors tend to violate the assumptions of theoretical model and empirical strategy.

On the other side of the coin, the hedonic price model has important advantages in comparison to other methods. Baranzini *et al.* (2008, p. 4) lists these advantages as:

- "It is based on households' real WTP for the dwelling's characteristics as revealed on the market, rather than households' assessment of hypothetical alternatives from which their supposed WTP is deduced;
- It integrates and values environmental quality and the features of the urban neighborhood of the dwellings in a coherent framework, which also incorporates physical condition of the apartment and building quality characteristics; With the recent development of geographic information systems (GIS), statistical treatments and environmental quality measures, the hedonic approach allows to analyze a large portion of the housing/rental market, including thousands of observations, providing thus more reliable indications than, e.g. surveys confined to a few hundreds of households."

Due to the risks listed above, the identification and the functional form of the hedonic regression equation becomes important. In the functional form, models are estimated linear, semi-log, or log-log form. Because of limited guidance from economic theory, selecting a proper or well-fitted functional form has been a frequent concern in the literature. Both Lancaster (1966) and Rosen (1974) did not impose a strict functional form to the models. Goodman (1978), Can (1992), Dubin (1992), Basu and Thibodeau (1998), Gillen et al (2001), Goodman (2002), and Pace and Gilley (1997), Rasmussen and Zuehlke, (1990), Anglin and Gencay (1996), Bin (2004),Epple*et al*. (2014) are important contributions to the functional form and identification discussion. The most common functional form of empirical HPM researches is the semi-logarithmic form, which gives a chance to interpret the coefficient estimates as proportions of the price. The independent and dependent variables selected for the hedonic price model in the housing market can be grouped into four vectors with characteristics.

Comprehensive literature survey of Malpezzi (2003) shows general functional form such as:

R= f(S,N,L,C)
S= Housing characteristics
N= Neighborhood characteristics
L= Location characteristics
C= Contract type

Sirmans *et al.* (2005) review the hedonic pricing models of 125 empirical studies. Variables of empirical researches are the changes country by country but authors classify the characteristics with three groups (locational, structural and neighborhood). Variables in each group are listed below: Structural characteristics are number of rooms, bedrooms, bathrooms, floor area, basement, garage, and patio, water/air heating system/fireplaces, cooling systems/central air conditioning, structural quality (e.g., design, materials, fixtures), sport facilities lift, number of flats, construction material. These characteristics can be described as internal characteristics of housing. Locational characteristics are accessibility to Central Business District, view of sea, lake, mountain, hills, valley, river, forest. Neighborhood characteristics are socio economic composition of residents, number and quality of hospitals, schools, provision of public goods, places of prayer halls, crime rate, noise, pollution, shopping malls, and ethnic diversification of district.

In the Albanian literature, most of the studies on the housing prices market are mainly conducted at the macro level. They try to find the impact of housing prices on mortgages (Rebi, 2014), on the stability of the financial system (Bozdo, 2007), on house prices, credit and consumption interrelation (Bollano and Ziu 2009), etc., while Ibrahimaj and Mattaroci (2014) study the factors that have an impact on the construction sector in Albania. The literature on the research of housing pricing models in Albania consists of no more than a few studies. The application of the hedonic price model can be found in a few papers focusing mainly not in large databases (using private databases). The studies found focus mainly in the city of Tirana, in areas of Tirana (business centers in Tirana) or in touristic cities like Saranda (Kushi and Caca, 2010).

Thanasi (2015) in a study that applies the hedonic price model in Tirana, using a database of 1421 apartments obtained through the real estate magazine Çelësi, finds interesting results. The variables she uses on the model represent the structural characteristics and the location of the apartments, while other variables that see the neighborhood characteristics, etc, are not included. Location is the factor which seems to affect mostly the housing prices. All the other factors remain costant, an increase of the house price by 10 sq meters would cause an increase by about 10% on the house price. Having a park lot increases the house price by 12.6% more than when it lacks. Alliu (2012) shows that the factor influencing the market value of the house most is the building age.

Asilkan *et al*. (2011) estimate the market values of houses in Tirana by using data mining. They use a sample of 200 properties in Tirana, taking data from real estate agencies and magazines, taking into account factors about the location, structure and neighborhood attributes of the properties. Tirana is split into5 different zones as location is seen as a main factor in affecting housing prices. The results show that land size, number of bathrooms, location and closeness to facilities were found to be the most significant attributes affecting the price of a house, while the number of rooms and balconies were not statistically significant. Living in a different area than Zone 1, has negative effects on housing pricing on average for all areas.

Shehu *et al.* (2015), checking data on 133 apartments[1] in 4 different areas of the city of Tirana, bring results that the number of rooms, property condition, number of balconies affect positively the houses prices. However, the prices are affected negatively apparently if the apartment is situated in a different area than the main area of the city. Age is not included in the factors studied as it is seen related with the quality of the building included in the hedonic regression. Shehu and Afezolli (2014) focus in another paper only on the factors of the age of the building and the location of it. Using data on 12 most important office buildings (business centers) in the city of Tirana, they find that location influences the most the price of the apartment located in this buildings by 2.82% (negative effect if not situated in the main area). All the other factors remain costant, the effect of the age of the building on the price of the apartments in it is quite small and is only 0.3% if the building is one-year-older.

Kushi and Caca (2010) examine the determinants of room prices for hotels in the most important touristic city of Albania, Saranda, using a hedonic price model. It uses primary data collected through surveys on 54 hotels, taken during the summer of 2008 in the city of Saranda.

[1] Apartments sold at the time of the study, real data

Their hedonic price model is regressed expressing the room prices in terms of the hotels' characteristics. They estimated that the characteristics that influence the room prices the most were if the hotel had breakfast or not (type of board) influencing positively by 0.4%, the room capacity effecting negatively by 0.31% etc. Apparently, the fact if the room had television and air condition (taking into account hot summer in Albania) influenced quite a lot the price of the rooms, as well.

3. Data and Model Specification

Review of related literature shows that housing characteristics can be divided into three groups: structural, neighborhood and locational characteristics. Expected coefficient signs of structural characteristics such as number of rooms, bedrooms, bathrooms, floor area, garage, elevator, air conditional system, floor area, additional facilities (swimming pool, tennis court etc.,) are positive and age is negative. Related literature expels that neighborhood characteristics and location characteristics affect housing prices. Distance to central business district (CBD), transportation options, view, gated communities affect housing price positively.

The data used in this study is drawn from the micro database of Living Standard Measurement Survey 2012 Instat (2013). The survey includes a sample of 6,671 households and information about housing characteristics, conditions and accessibility to school, hospital and bus station. Geographic segmentation of sample includes the 12 prefectures of Albania, by urban and rural strata.[2] Rural data is excluded from the dataset, because of lack of relevant housing market in most of the rural areas in Albania. Survey has information of 3,608 urban housing units but after outlier detection with Cook's distance which combines the information of leverage and residual of the observation dataset includes 2,976 observations. Data set captures construction cost of housing but it is not a good proxy of housing value or market price. Due to the lack of price data, rent and potential rent prices are used as a dependent variable. Age data, is categorical for full sample and the survey captures in the construction yearly data only the dwellings constructed after 1990. Estimated models are specified as below:

$$rent = \beta_0 + \beta_1 \text{Period } 45-60 \beta_2 \text{before1945} + \beta_3 \text{Period61} - 80 + \beta_4 \text{Period } 81-90 + \beta_5 \text{after90} + \beta_6 \text{ sqless40} + \beta_7 \text{Sq } 40-69 + \beta_8 \text{ Sq } 70-99 + \beta_9 \text{ Sq } 100-130 + \beta_{10} \text{Above sq } 130 + \beta_{11} \text{WCinside} + \beta_{12} \text{ Plastered} + \beta_{13} \text{ upto15} + \beta_{14} \text{ Terraced} + \beta_{15} Semidetach + \beta_{16} Detach + \beta_{17} Distance\ to\ school + \beta_{18} Distance\ to\ doctor + \beta_{19} Distance\ to\ bus + \beta_{20} Dark + \beta_{21} Heatingproblem + \beta_{22} Leakingroof + \beta_{23} Dampwalls + \beta_{24} Badwindows + \beta_{25} Numberofrooms + \beta_{26} Berat + \beta_{27} Diber + \beta_{28} Durres + \beta_{29} Elbasan + \beta_{30} Fier + \beta_{31} Gjirokaster + \beta_{32} Korce + \beta_{33} Kukes + \beta_{34} Lezhe + \beta_{35} Shkoder + \beta_{36} Tirana + \beta_{37} Vlore \quad (1)$$

Location or regional segregation on housing market has a big explanatory power. Because of this, model 1 is specified with prefecture dummies, while the regional dummies are excluded from model 2.

$$lnrent = \beta_0 + \beta_1 \text{Period } 45-60 \beta_2 \text{before1945} + \beta_3 \text{Period61} - 80 + \beta_4 \text{Period } 81-90 + \beta_5 \text{after90} + \beta_6 \text{ sqless40} + \beta_7 \text{Sq } 40-69 + \beta_8 \text{ Sq } 70-99 + \beta_9 \text{ Sq } 100-130 + \beta_{10} \text{Above sq } 130 + \beta_{11} \text{WCinside} + \beta_{12} \text{ Plastered} + \beta_{13} \text{ upto15} + \beta_{14} \text{ Terraced} + \beta_{15} Semidetach + \beta_{16} Detach + \beta_{17} Distance\ to\ school + \beta_{18} Distance\ to\ doctor + \beta_{19} Distance\ to\ bus + \beta_{20} Dark + \beta_{21} Heatingproblem + \beta_{22} Leakingroof + \beta_{23} Dampwalls + \beta_{24} Badwindows + \beta_{25} Numberofrooms \quad (2)$$

Model 3 and Model 4 are after 1990 constructed dwellings subsample. Number of observations decrease 1,262 but age variable is numerical. Differences between model 3 and 4 are regional characteristics' dummies.

[2] Detailed explanation of survey methodology is described in http://www.instat.gov.al/en/themes/living-standard.aspx

$$lnrent = \beta_0 + \beta_1\ age + \beta_2 Dark + \beta_3 Heatingproblem + \beta_4 Leakingroof + \beta_5 Dampwalls + \beta_6 Badwindows + \beta_7 Numberofrooms + \beta_8 \text{Sq } 40-69 + \beta_9\ \text{Sq } 70-99 + \beta_{10}\ \text{Sq } 100-130 + \beta_{11}\text{Above sq } 130 + \beta_{12} Distance\ to\ school + \beta_{13}\text{WCinside} + \beta_{14}\text{Plastered} + \beta_{15}\ \text{upto15} + \beta_{16}\ \text{Terraced} + \beta_{17}\ Semidetach + \beta_{18} Detach + \beta_{19} Distance\ to\ doctor + \beta_{20}\ Distance\ to\ bus \quad (3)$$

$$nrent = \beta_0 + \beta_1\ age + \beta_2 Dark + \beta_3 Heatingproblem + \beta_4 Leakingroof + \beta_5 Dampwalls + \beta_6 Badwindows + \beta_7 Numberofrooms + \beta_8 \text{Sq } 40-69 + \beta_9\ \text{Sq } 70-99 + \beta_{10}\ \text{Sq } 100-130 + \beta_{11}\text{Above sq } 130 + \beta_{12} Distance\ to\ school + \beta_{13}\text{WCinside} + \beta_{14}\text{Plastered} + \beta_{15}\ \text{upto15} + \beta_{16}\ \text{Terraced} + \beta_{17}\ Semidetach + \beta_{18} Detach + \beta_{19} Distance\ to\ doctor + \beta_{20}\ Distance\ to\ bus + \beta_{21} Berat + \beta_{22}\ Diber + \beta_{23} Durres + \beta_{24} Elbasan + \beta_{25}\ Fier + \beta_{26} Gjirokaster + \beta_{27} Korce + \beta_{28} Kukes + \beta_{29} Lezhe + \beta_{30} Shkoder + \beta_{31}\ Tirana + \beta_{32}\ Vlore \quad (4)$$

Table 1 shows summary statistics of variables which is used in estimated models.

Table 1. Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Lnrent	3162	11.4958	0.88887	9.21034	13.1224
Berat	3162	0.06483	0.24627	0	1
Diber	3162	0.02182	0.14612	0	1
Durres	3162	0.04048	0.19712	0	1
Elbasan	3162	0.08349	0.27667	0	1
Fier	3162	0.06831	0.25232	0	1
Gjirokaster	3162	0.08602	0.28044	0	1
Korce	3162	0.07084	0.2566	0	1
Kukes	3162	0.07843	0.26889	0	1
Lezhe	3162	0.08855	0.28414	0	1
Shkoder	3162	0.0759	0.26488	0	1
Tirane	3162	0.21505	0.41092	0	1
Vlore	3162	0.10626	0.30822	0	1
Period 45-60	3162	0.06388	0.24458	0	1
before1945	3162	0.02467	0.15514	0	1
Period 61-80	3162	0.2217	0.41545	0	1
Period 81-90	3162	0.2723	0.44521	0	1
after90	3162	0.41746	0.49322	0	1
sqless40	3162	0.01803	0.13307	0	1
Sq40-69	3162	0.22264	0.41609	0	1
Sq70-99	3162	0.42536	0.49448	0	1
Sq100-130	3162	0.26154	0.43954	0	1
Abovesq130	3162	0.06135	0.24002	0	1
Wc inside	3162	0.91018	0.28596	0	1
Plastered	3162	0.68912	0.46293	0	1
upto15	3162	0.19734	0.39806	0	1
Terraced	3162	0.04238	0.20148	0	1
Semi detach	3162	0.08286	0.27571	0	1
Detach	3162	0.58444	0.4929	0	1
Distance to school	3162	14.7619	12.5317	0	90
Distance doctor	3162	16.6588	14.0967	0	180
Distance to bus	3162	13.1553	12.5104	0	150
Dark	3162	0.05882	0.23533	0	1
Heating problem	3162	0.20304	0.40232	0	1
Leaking roof	3162	0.07432	0.26233	0	1
Damp walls	3162	0.10373	0.30496	0	1
Bad windows	3162	0.0759	0.26488	0	1
Number of rooms	3162	3.03574	1.03207	0	12
Age	1317	12.2468	5.51571	0	22

Source: Authors calculations based on Living Standard Measurement Survey 2012 (Instat 2013)

In order for our model to be BLUE (so to have the Best Linear Unbiased Estimators) the Gauss-Markov theorem demands testing a few assumptions in which the OLS estimation method is build, the so called Assumptions of the Classical Linear Regression Model. In all of our models, we tested the hypothesis shown in Table 2. The hypothesis of constant variance in our errors (no

presence of heteroskedasticity) is tested with the Breusch-Pagan / Cook-Weisberg test. The hypothesis if we have the right functional form or not (if the model has any omitted variables) is tested with the Ramsey RESET test. The hypothesis whether our errors are normally distributed or not is tested with the Shapiro-Wilk W test for normal data. The p-values in all of our models for all of these tests we saw are less than the p-value (this tests produce) < α=5% (our chosen level of significance for this tests), so we cannot reject our null hypothesis, therefore our estimators are BLUE

Table 2. Testing CLR assumptions

Hypothesis	**MODEL1**	**MODEL2**	**MODEL3**	**MODEL4**
Ho: Constant variance (Breusch-Pagan / Cook-Weisberg test)	Prob> chi2 = 0.00	Prob> chi2 = 0.0004	Prob> chi2 = 0.00	Prob> chi2 = 0.00
Ho: model has no omitted variables (Ramsey RESET test)	Prob> F = 0.00	Prob> F = 0.0002	Prob> F = 0.00	Prob> F =0.0307
Ho: model errors are normally distributed (Shapiro-Wilk W test for normal data)	Prob> z = 0.00	Prob> z = 0.00	Prob>z = 0.00	Prob> z = 0.00

According to regression results given in Table 3, most of independent variables used in empirical models are statistically significant and they are consistent with economic theory and previous researches. For instance, a property with heating problem is nearly 8 percent cheaper than average if the other characteristics are same. Number of rooms, WC inside dwelling, plastered, bricks and plastered dwellings have positive impacts on rent and terraced, detached, semidetached, up to 15 flats dwellings has lower rent values. Periodical age coefficients show that in 81-90 period constructed dwellings have lower rent values in comparison to after 90 constructed dwellings.

The results also denote that prices of the detached, semi detached, terraced and up to 15 apartments are less in the range of other types of houses, are less in a range of 15% to 33% compared to the base category (dwelling with more than 15 flats) for the urban area and full sample with regional dummies (Model 1), while the range is higher without regional dummies estimation (Model 2) and after 1990's constructed dwellings. Construction period dummies are insignificant but consistent with literature except period 81-90 which is statistically significant and lower than after 1990 constructed dwellings. The results also explore that prices of the plastered dwellings are higher in a range of 12% to 32% compared to the other categories (partially plastered and non-plastered dwellings) for all models. Also bricks and stone dwellings are higher in the 9% to 14% in comparison to pre-fabricated, wood, mud and eternit dwelling unit for whole sample (Model 1 and Model 2) but insignificant after 1990 constructed dwellings (Model 3 and Model 4). Keeping other independent variables, one-year increase of dwelling age decreased rent value for more than 10%. In addition to this, distance to bus station has significant and negative impact on rents.

Table 3. Empirical Results

VARIABLES	(1) Lnrent	(2) Lnrent	(3) Lnrent	(4) Lnrent
	HOUSING CHARACTERISTICS			
Number of rooms	0.0697***	0.167***	0.140***	0.0554***
	(0.0117)	(0.0206)	(0.0350)	(0.0180)
Detach	-0.324***	-0.621***	-0.836***	-0.318***
	(0.0341)	(0.0494)	(0.0697)	(0.0468)
Semi detach	-0.293***	-0.497***	-0.704***	-0.251***
	(0.0418)	(0.0676)	(0.109)	(0.0646)
Terraced	-0.159***	-0.373***	-0.181	0.0351
	(0.0533)	(0.0730)	(0.126)	(0.0831)
upto15	-0.147***	-0.205***	-0.189**	-0.0411
	(0.0349)	(0.0539)	(0.0931)	(0.0523)
Bricks	0.0935**	0.140*	0.176	0.0931
	(0.0447)	(0.0770)	(0.217)	(0.125)
Plastered	0.123***	0.242***	0.310***	0.193***
	(0.0205)	(0.0331)	(0.0688)	(0.0433)
WC inside	0.128***	0.395***	0.515***	0.312***
	(0.0342)	(0.0559)	(0.0929)	(0.0617)
Regional FE	YES	NO	NO	YES
	HOUSING AGE			
per4560	-0.0537	-0.0622		
	(0.0336)	(0.0621)		
before1945	0.00588	-0.00787		
	(0.0556)	(0.103)		
per6180	0.0127	-0.141***		
	(0.0220)	(0.0406)		
per8190	-0.144***	-0.215***		
	(0.0199)	(0.0365)		
Age	-	-	-0.0101***	0.00178
			(0.00262)	(0.00413)
Regional FE	YES	NO	NO	YES
	HOUSING SIZE			
sqless40	-0.0389	0.00182	-0.116	0.129
	(0.0659)	(0.123)	(0.165)	(0.302)
sq4069	0.0210	-0.00380	0.0655	0.0398
	(0.0256)	(0.0473)	(0.0445)	(0.0809)
sq7099	0.0168	0.00685	0.0299	0.0233
	(0.0198)	(0.0366)	(0.0292)	(0.0533)
abovesq130	0.0667*	0.193***	0.0878**	0.297***
	(0.0366)	(0.0624)	(0.0755)	(0.0450)
Regional FE	YES	NO	NO	YES
	NEIGBOURHOOD CHARACTERISTICS			
Distance to school	0.000671	0.00260	0.000131	0.00479*
	(0.000889)	(0.00166)	(0.00138)	(0.00253)
Distance to doctor	0.000177	0.00147	0.000609	-0.00201
	(0.000796)	(0.00148)	(0.00139)	(0.00255)
Distance to bus	-0.00150**	-0.00402***	-0.00101	0.000994
	(0.000726)	(0.00135)	(0.00115)	(0.00209)
Regional FE	YES	NO	NO	YES
	HOUSING PROBLEMS			
Damp walls	-0.0266	-0.0575	-0.0728	-0.166*
	(0.0276)	(0.0512)	(0.0521)	(0.0940)
Bad windows & doors	-0.00208	-0.0574	0.0212	-0.0659
	(0.0332)	(0.0616)	(0.0795)	(0.145)
Leaking roof	-0.0132	-0.113*	0.0403	-0.106
	(0.0326)	(0.0607)	(0.0767)	(0.140)
Heating problem	-0.0800***	-0.185***	-0.0585*	-0.268***
	(0.0199)	(0.0369)	(0.0335)	(0.0606)
Constant	11.32***	10.88***	11.36***	10.90***
	(0.0838)	(0.125)	(0.190)	(0.280)
Observations	2,976	2,976	1,262	1,262
R-squared	0.787	0.256	0.796	0.299
Constant	11.32***	10.88***	11.36***	10.90***

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

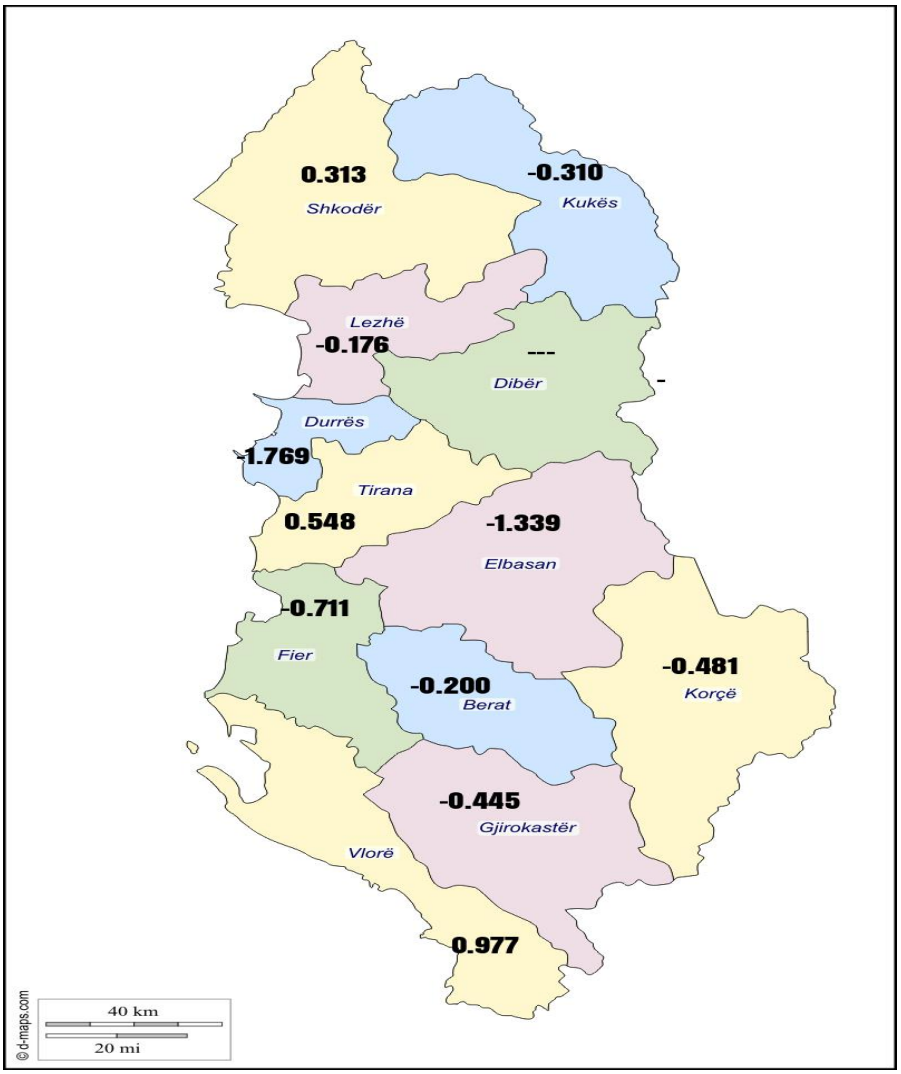

Figure 4. Regional impacts on rents full sample (The other regions compared with Diber and all coefficients are significant at 0.001 level)

Note: Map is created by using d-maps.com (http://www.d-maps.com/carte.php?num_car=17703&lang=en)

Figure 4 and Figure 5 show the regional impacts on rents. Maps in Figure 4 and 5 explore the coefficients of regional dummies and results show that dwellings in Shkoder, Tirana, Vlore, Durres prefecture have higher rent values than base region (Diber) and the other regions have lower rent values when the other characteristics are same. Highest regional effect coefficients are Vlore and Durres, which are rapidly developing tourism destinations and capital city Tirana. According to the estimation results R^2 shows huge variation between regional dummies included and excluded models. R^2 values are less than 0.30 for without regional dummy model and higher than 0.75 for with regional dummies. This variation shows the importance of regions on housing values that is commonly underlined in literature.

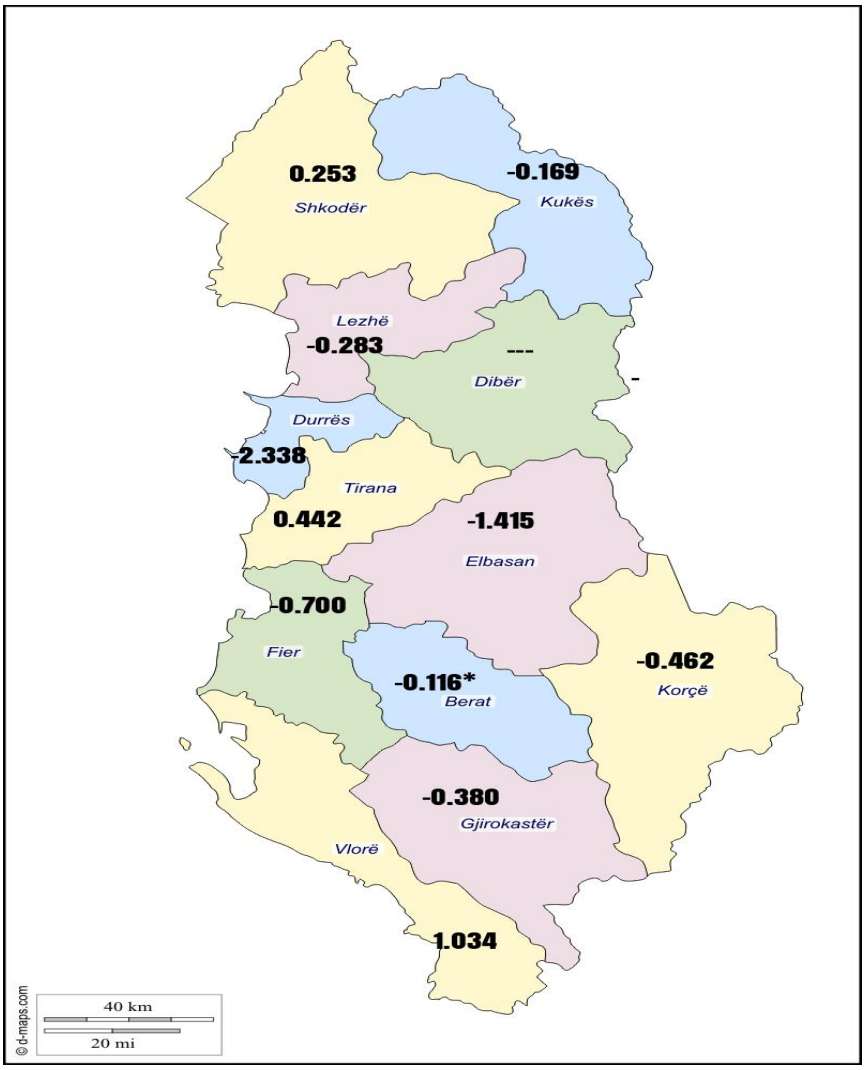

Figure 5. Regional impacts on rents full sample (The other regions compared with Diber and all coefficients are significant at 0.001 level except *)

Note: Map is created by using d-maps.com (http://www.d-maps.com/carte.php?num_car=17703&lang=en)

4. Conclusion

Hedonic price model estimations are valuable tools for real estate professionals in determining the correlation between building characteristics and the transaction price, as well as in predicting future transaction pricing. It is also valuable for investment decision making process and for policy makers working about urban planning and public investment. The results from this study can give tips to development decisions such as what building attributes to include in an effort to generate the highest value on a parcel of land, what kind of public goods are more valuable for households. To summarize the result of empirical results, urban Albanian housing market is highly segmented between developed and developing cities, and touristic destinations of country are more attractive than the other regions. High quality construction materials, newer and bigger dwellings have higher rent than do the others. Bus station accessibility is one of the most important determinants on housing values. Although Albania has a thin and newly created housing market, empirical results are consistent with the economic theory and previous literature.

Due to a lack of price data, rent values are used as a dependent variable for this study. But for further researches, collecting a sufficient price data can give more clear information about the determinants of housing values in Albania.

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