Which Factors Influence the Choice of Real Estate in 2014: A Case Study on Thessaloniki

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SUMMARY

The real estate sector was one of the most active and influential sectors of the overall performance of the Greek economy. This fact was reversed by the time the economic crisis caused the great economic recession. The factors that determine the specific structure of residential properties within the central area of a metropolitan city vary according to the residents' and area's needs.

Thessaloniki, which is the second larger city in Greece, has a densely populated central area with great demand for both residential and commercial properties. Initially, data for a large number of properties within the historic centre of the city were collected and organized in three categories: urban characteristics (land use, kind of property), spatial characteristics (municipality, address, postal code etc.) and descriptive characteristics (size, floor, parking etc.). Through the categorization of the data, the study aims at highlighting the main contributional factors of choice of residential property in central Thessaloniki. With the effects of the economic crisis being present, investors set aside certain factors that increase the value of their estate, such as the view, whether the kitchen is in a separate room or within the living room, and whether the estate is fully renovated or not. Apart from these findings, traditional factors affecting the value (age, size, way of heating etc.) continue to influence investors' choices.

Therefore, it is very interesting to highlight the significance of each factor and whether it is the economic crisis that altered the investors' preferences or just a smaller real estate cycle that Greece is experiencing.

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1. INTRODUCTION

Properties are made up by numerous components which influence -additionally or deductively- their value. These components can be classified in five major categories, which refer to internal or external characteristics in each case: social (external), economic-fiscal (external), environmental (external), physical (internal), governmental (external) and location. For decades physical characteristics and location were the basic factors that influenced values and investors' choices. To be more precise, physical characteristics refer to the kind of property (flat, detached/semi-detached house etc.), size, floor, number of rooms, bathrooms and other similar aspects. On the other hand, location was and remains in some cases the most influential and critical factor on the choice of property. Additionally, economic and political stability and social prosperity reinforced the importance of such characteristics in comparison with socio-economic, government and fiscal factors. Sirmans and Macpherson (2003) who conducted a study on the marginal value of individual characteristics of housing for Philadelphia, USA, found that certain characteristics had a substantial effect on value. For example, each additional full bath adds about 24% to the selling price, whereas a garage adds about 13% (Sirmans & Macpherson, 2003). On the other hand, location choice can vary according to housing tenure type and income and assets level (Yi & Lee, 2014).

However, investment strategies have changed, as economic instability and financial austerity started to rapidly gain ground especially after 2010. As far as Greece is concerned, before economic crisis appeared, the real estate sector was extremely active, as property investment was presumed to be one of the safest investment vehicles. Nowadays, due to fiscal policies towards real estate (because of the economic crisis), this situation has reversed, as owning a property has become unprofitable and costly, especially if an individual owns more than his residential property (Sampaniotis, 2011; Vlamis, 2013). However, apart from any changes in property development and acquisition, there are still certain basic factors that investors take into serious consideration. It must be mentioned, though, that these factors possibly differ between geographic locations and different civilizations.

This study aims at highlighting the internal structural factors that influence residential values in Thessaloniki, a city in northern Greece. Thessaloniki is the second largest city in Greece and the largest metropolitan and urban area in northern Greece. Urban sprawl which slowly began in 1971 but intensified during the decade 1991-2001 gave boost to real estate construction. Economic and political stability in combination with a high and intense demand created a real estate bubble which raised values up to illogical levels. Especially in central and east areas, constructors and sellers gained huge amount of money giving them the opportunity to re-invest them in new constructions. By the time economic crisis hit (2008-2009), many new constructions were on sale and even more were being constructed. When demand started

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to fall and new constructions were entering the market, values remained at high levels for some time, before they started to fall. Transaction started to decrease dramatically, demand almost hit ground and values started to fall radically for older properties but still slowly for new ones.

However, apart from the decreased values, there are still certain characteristics that buyers and investors seek in a residential property. These structural characteristics and their influence on values are the key element of study for this paper. The aim of this paper is to highlight the amount of influence each special characteristic places on the actual sale value.

2. METHODOLOGY

Residential properties are marketed goods which have a defined and measurable value. However, their value is influenced by non-measurable factors, such as external environmental and neighborhood characteristics, location demand and other perceptual factors. Understanding the difficulty in determining the influence of non-marketed factors on real estate values has lead scientists and researchers towards the development of certain methodologies so as to solve this problem. A first definition of non-marketed/non-measurable goods was given in 1954 by Scitovsky, who stated that they are goods that are consumed by people but not traded in markets (Scitovsky, 1954). Afterwards, many methodologies have been developed for such issues, both direct and indirect. Hedonic modelling is one indirect method of inferring the influence of non-marketed goods on marketed ones. Hedonic valuation which is commonly used in property valuation when assessing the value of green spaces, view, transportation means etc. was firstly introduced by Court A. (1939) for automobiles, but it was Rosen (1974) who massively applied hedonic models (Goodman, 1998; Hartog, 2002). Despite any controversy (Haneman, 1994), from then on, a large number of studies on various issues have used hedonic modeling as their methodology, making hedonic models more applicable as time passes (Anas and Eum, 1984; Can, 1992; Clapp and Giaccotto, 1998; Bastian, McLeod, Germino, Reiners and Blasko, 2002; Stevenson, 2004; Cebula, 2012; Seo et al., 2014; Grislain-Letrémy and Katossky, 2014).

The basic steps and structure of a hedonic model are the following: A large number of data are collected and categorized accordingly for the regression analysis. At second point, the regression type is chosen (linear, log-linear etc.) and an equation is structured with all the influential variables. The general form of the equation is:

$$P = f(N_1, N_2 \dots N_i, R_1, R_2 \dots R_i, E_1, E_2 \dots E_i)$$

where $N_1 \dots N_i, R_1 \dots R_i, E_1 \dots E_i$ are the independent variables in categories (eg. economic, social, property characteristics etc.) ans P is the dependent variable (eg. property values, welfare etc.).

A number of 207 property transactions during 2009-2014 (6 full years) are the primary data on which the model of this study is based. Structural data, location characteristics and perseptional factors were documented for each property. Due to the fact that many transaction values were documented in the past, there was a need for bringing them to present. Values were discounted up to the end of 2014, as values changes for 2015 have not been documented

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yet. This update was conducted with the use of Indexes for residential properties by geographical area for new (up to 5 years) and old (over 5 years) buildings, which are produced by the Bank of Greece (Bank of Greece, 2015).

After this adjustment, all data were specially organized and codified accordingly to the regression needs. The regression was conducted by the use of IBM SPSS Statically Software package.

As far as the study area is concerned, Thessaloniki was selected due to its market size and urban characteristics. Thessaloniki is the second largest urban area in Greece with an active economic life due to its proximity to the borders and its port. On the other hand, Thessaloniki is a viable urban area (not very large in size) with environmental and topographical characteristics which provide each subarea with pros and cons. It is developed on the gulf of Thermaikos at southwest and on the mountain of Kedrinos Lofos next to the Seix Sou forest at the northeast. Its urban plan is complex as the historical center is densely built and populated, the west area is less compact and the east areas are the most sparsely built with large building plots and open areas. Many of these characteristics cause the creation of different patterns in real estate development and especially residential development which follow the needs and preferences of byers in each subarea.

3. RESULTS AND DISCUSSION

A sample of 207 properties was used in the hedonic model. An estimation error less than 10% is accepted and perceived not to affect the accuracy of the model. Therefore, all independent variable that remained in the regression model as influential factors achieved a significance level lower than 10%. It is worthy mentioned that none of the 207 cases was found to be outlier, a fact that proves an increased -but not total- uniformity in the downwards shift of residential values. The variables that were documented and initially introduced to the regression analysis are shown in Table 1:

Table 1, Descriptive statistics

	Description	Mean	Std. Deviation	N
Value (€)	Market value brought to present	1361,156	683,9052	207
Renovated	Whether the property has been renovated or not	0,67	1,332	207
Floor	In which floor is the property	3,21	2,027	207
Rooms	Number of rooms	0,71	1,13	207
Kitchen	Whether the kitchen is separate, semi-separate or within the living room	0,47	0,944	207
Bathroom/WC	Number of bathrooms and WC	0,53	0,88	207
Frontage	The view from the frontage of the property	1,2	1,125	207

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	Description	Mean	Std. Deviation	N
Elevator	Whether the property's building has an elevator	0,31	0,542	207
Parking	Existence of parking	0,34	0,796	207
Storage_room	Whether there is a storage room eothin the property or in the basement	0,34	0,64	207
Heating	Way of heating	1,46	2,83	207
Frames	Kind of window frames	0,54	0,885	207
Floors	Kind of floors	0,86	1,791	207
Door	Kind of door	0,38	0,778	207
Sqrt_condition	Condition of the property	1,5458	0,41455	207
Unit_by_age	Age of the property	0,0628	0,07353	207
ln_size	Size of the property (m^2)	4,344	0,42556	207
Orientation	Orientation	5,73	2,044	207

The variables that were found to be influential were Age, Floor, Elevator, Size, Frames, Door, Condition, Rooms and Frontage. The R coefficient (73.8%) indicates the correlation between observed and predictive values of the dependent variable. The coefficient of determination (54.5%) indicates that more than half of the variations of the dependent variable are explained by the variations of the independent ones. Likewise, the adjusted R^2 (52.4%) suggests that the predictive power of the model is satisfactory (Table 2).

Table 2, Model summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
0,738	0,545	0,524	471,70423	1,447

It is worthy mentioned that the most significant impact is documented by the age of the building. As age increases, residential value falls. Other influential factors are the condition, the frames of the windows –especially nowadays when energy saving is seriously taken into account- and the existence of an elevator –a factor which gradually becomes more important for residencies over the second floor. All independent variables achieve a significance level lower than 10%. Lastly, the B coefficient of the constant variable is higher than only two of the independent variables' B coefficient. This proves the fact that the structural characteristics are much more important than other general factors of the socioeconomic background of the market, which forms the lower bound from which values begin to increase accordingly to the property's characteristics. The least influential factor is the frontage and the kind of floors. These results are both expected, as investors place more importance on the actual

characteristics than the frontage of the building, and as floors are very easy to change or renovate with low cost.

Table 3, Coefficient table

Model	Unstandardized Coefficients		Sig.	95,0% Confidence Interval for B		Collinearity Statistics	
	B	Std. Error		Lower Bound	Upper Bound	Tolerance	VIF
(Constant)	181,807	403,841	0,653	-614,600	978,213		
Ena_by_age	3155,435	536,354	0,000	2097,703	4213,166	0,694	1,440
Floor	105,067	17,011	0,000	71,519	138,615	0,909	1,101
Elevator	-458,158	73,842	0,000	-603,781	-312,535	0,673	1,485
ln_size	289,718	88,602	0,001	114,988	464,448	0,760	1,316
Frames	-387,037	68,564	0,000	-522,250	-251,823	0,293	3,412
Door	319,455	70,559	0,000	180,306	458,603	0,359	2,788
Sqrt_condition	-418,700	98,112	0,000	-612,184	-225,215	0,653	1,532
Rooms	247,897	41,246	0,000	166,557	329,237	0,497	2,011
Frontage	73,904	34,362	0,033	6,141	141,668	0,722	1,384

In passing, it should be mentioned that standard diagnostic tests have been carried out to ensure the stability of the model. Specifically, Durbin-Watson statistic suggests that the model is free from serial correlation which in combination with the F-test (sig.<0.05) proves that the model is stable. Collinear relationships ae not observed in the model, as indicated by the Tolerance and Variance Inflation Factor (VIF). Normality and linearity are also observed as both Figures 1 and 2 suggest.

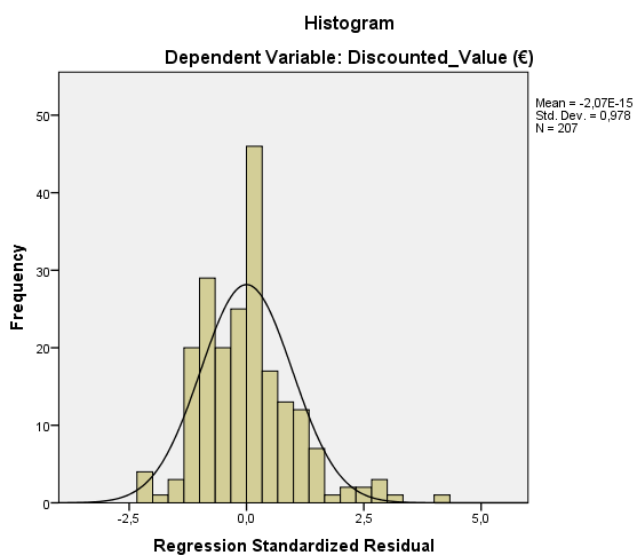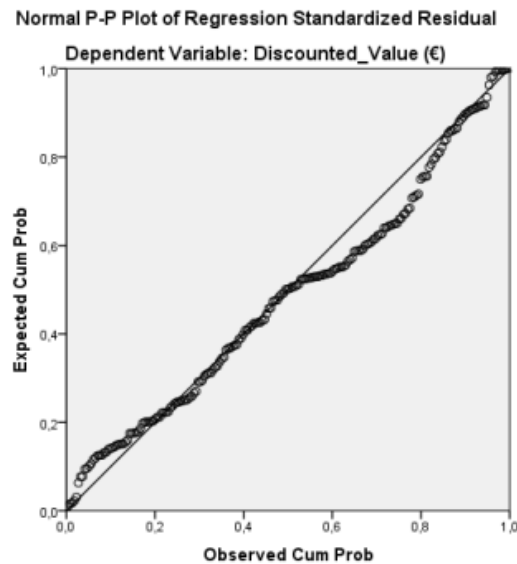Figure 1, Histogram for the normality of the residuals

Figure 2, Normal P-P Plot of regression standardized residual

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Finally, the scatterplot of the standardized predicted value and the studentized deleted residuals proves the absence of heteroscedasticity.

To summarize, the model highlights the importance of the structural characteristics of a residential property. The shift in the economic stability of Greece, the amount of taxes and the income losses in combination with inflation have clearly altered consumers' and investors' preferences (Bank of Greece, 2012; Bank of Greece, 2013). The economic crisis has minimized property transactions, but has highlighted the real factors that investors take into account. Factors, such as the number of bathrooms or WC, the existence of storage rooms, the separate or semi-separate kitchen and whether the property is renovated or not, are perceived as secondary with little effect on the value. It must be stated though that this result does not imply that the previous factors are not taken into consideration at all. Preferences differ and so the importance of each factor alters between investors.

The general finding is that the economic crisis has altered investors' decisions and smoothened their demands. When income revenues were high and stable, investors placed their interest in more detailed characteristics of a property and offered more money for it. Supply, on the other hand, started to increase and so did property values. When the crisis hit and values started to fall, investors realized that they must initially seek satisfaction for basic characteristics and, in secondary level, if possible, for additional factors.

4. CONCLUSIONS

Residential values increase by fundamental factors of each property (size, age, floor etc.). This study suggests that when any outstanding global event emerges, such as the Greek financial crisis, the effects on sub-markets are noticeable. Regular investors' preferences alter and previous excessive demands start to lose ground. The decrease in income revenues has made investors cautious, so as to invest their reduced capital correctly. While in previous years, property possession and investment was considered to be the safest investment in Greece, nowadays unfair taxation and other macroeconomic factors have caused transactions to decrease and limit down only to the acquisition of one property for residential use.

To end with, it would be an omission not to put down a few words for the interaction of buyers and sellers. The supply of properties is high and constant as almost no transactions are made. On the other hand, the demand is small but stable. Due to the fact that constructors and sellers are urgently willing to sell their properties, decreasing values up to some point, investors have become even more cautious and intransigent on their demands. They demand certain basic characteristics and are not willing to pay anything more for any secondary factors. This precise fact is proven by this study, which clearly gives an overall idea of the investors' prespectives.

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BIOGRAPHICAL NOTES

Agapi Xifilidou is a PhD Candidate on Real estate analysis in the School of Rural and Surveying Engineering in Aristotle University of Thessaloniki, Greece. She graduated from School of Spatial Planning and Development (Eng.), AUTh (2010) and received an MSc on Environmental Protection and Sustainable Development, AUTh (2011). Meanwhile, she is finishing her second MSc on Real Estate Investment and Finance of Herriot-Watt University in Edinburgh, Scotland. She has attended numerous conferences and has published over 20 articles in proceedings and journals. She has participated in two research programs on Geoinformatics and Real estate management, and on Deposition and Documentation of Geographic and Socioeconomic Data.

Konstantina Mangina graduated from the School of Rural and Surveying Engineering of Aristotle University of Thessaloniki. She is interested in real estate, cartography and Geographical Information System. She has participated in many conferences.

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Vassilios Tsioukas obtained Ph.D in 'Digital Photogrammetry' from the Aristotle University of Thessaloniki, Greece. He is a specialist in Digital Photogrammetry, Remote Sensing, Laser Scanning and CAD for Surveying Applications, and since 1993 has been working in many national and international Research Programmes. He was an assistant professor in the Dept. of Architectural Engineering in the Democritos University of Thrace (2003-11) and since 2011 is an associate professor in the School of Rural and Surveying Engineering at the Aristotle University of Thessaloniki and is an invited Professor since 2005 in the "Environmental Management" Postgraduate Programme of The Mediterranean Agronomic Institute of Chania (M.A.I.Ch).

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