



**AN EMPIRICAL RESEARCH APPLYING HEDONIC PRICING  
MODEL: ALBANIAN CASE**

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MODEL: ALBANIAN CASE**

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# **AN EMPIRICAL RESEARCH APPLYING HEDONIC PRICING MODEL: ALBANIAN CASE**

## **ABSTRACT**

Based on the fact that that global literature accepts that still does not exist one best method of property evaluation, and on the lack of previous research paper on property evaluation in Albania, this research addresses several main questions. It is concerned with theoretical dimension of property evaluation in both theoretical and practical dimension. More importantly the paper assesses the most important factors to consider when doing property valuation in Albania.

Methodologically this thesis conducts an extensive literature and an empirical research in Albanian context. For conducting the empirical research a hedonic pricing model is used, integrated in a multiple linear regression statistical approach. Data for selected variables, as predictor of property price level have been gathered from two real estate agencies located in Tirana. Based on the results the paper develops two models of property evaluation, where one of them has improved statistical indicators.

The paper concludes that theory and practice of property evaluation have evaluated and have been improved during years, by concluding in the most used methods: Hedonist Models. Finally the paper concludes that Floors, Parking facilities, and Number of rooms, are the statistically significant variables in predicting price level of property in Albania.

**Keywords:** *Property Evaluation, Hedonist pricing model, Multi Linear Regression*

# NJË KËRKIM EMPIRIK DUKE APLIKUAR MODELIN HEDONIK TË ÇMIMIT: RASTI SHQIPTAR

## ABSTRAKT

Bazuar në faktin se literatura globale pranon se ende nuk ekziston metoda më e mirë e vlerësimit të pronës dhe se ka mungesë të studimeve të mëparshme për vlerësimin e pronës në Shqipëri, ky punim trajton disa pyetje kryesore. Punimi trajton dimensionin teorik të vlerësimit të pronës në dimensionin teorik dhe praktik. Më e rëndësishmja, punimi akseson faktorët më të rëndësishëm për t'u marrë parasysh kur bëhet vlerësimi i pronës në Shqipëri.

Metodologjikisht, kjo tezë kryen një hulumtim të thelluar të literaturës dhe një studim empirik në kontekstin shqiptar. Për kryerjen e studimit empirik është përdorur një model i çmimit hedonik, i integruar në një qasje statistikore të regresionit të shumëfishtë linear. Të dhënat për variablat e përzgjedhur, si parashikues të nivelit të çmimit të pronës janë mbledhur nga dy agjenci të pasurive të patundshme që ndodhen në Tiranë. Në bazë të rezultateve, punimi zhvillon dy modele të vlerësimit të pronës, ku njëri prej tyre indikatorë statistikorë të përmirësuar.

Punimi konkludon se teoria dhe praktika e vlerësimit të pronës kanë evoluar dhe janë përmirësuar gjatë viteve, duke rezultuar në metodat më të përdorura: Modelet Hedoniste. Përfundimisht, punimi konkludon se numri i kateve, facilitetet e parkimit dhe numri i dhomave janë variablat statistikisht të rëndësishëm në parashikimin e nivelit të çmimeve të pronës në Shqipëri.

**Fjalë Kyç:** *Vlerësimi i Pronës, Modeli Hedonist i çmimit, Regresioni i shumëfishtë linear*

## **DECLARATION**

I hereby declare that this Master's Thesis, titled: An Empirical Research Applying Hedonic Pricing Model: Albanian Case, is based on my original work except quotations and citations which have been duly acknowledged. I also declare that this thesis has not been previously or concurrently submitted for the award of any degree, at Epoka University, any other university or institution.

Miralda Shijaku

February 2018

## TABLE OF CONTENTS

<b>APPROVAL</b> .....	<b>i</b>
<b>ABSTRACT</b> .....	<b>ii</b>
<b>ABSTRAKT</b> .....	<b>iii</b>
<b>DECLARATION</b> .....	<b>iv</b>
<b>TABLE OF CONTENTS</b> .....	<b>v</b>
<b>LIST OF TABLES</b> .....	<b>viii</b>
<b>LIST OF FIGURES</b> .....	<b>ix</b>
<b>Acknowledgements</b> .....	<b>x</b>
<b>1. INTRODUCTION:</b> .....	<b>1</b>
1.1 The context of the investigation .....	1
1.2 Literature Gap.....	2
1.3 Aims of the investigation.....	2
1.4 Research Objectives .....	2
<b>2. LITERATURE REVIEW</b> .....	<b>3</b>
2.1 Property – Global Problem.....	3
2.1.1 European Union and properties .....	3
2.1.2 USA .....	3
2.1.3 China.....	4
2.1.4 Germany .....	4

2.2 Conceptual definitions.....	4
2.2.1 Property Right .....	4
2.2.2 Transaction cost and property right.....	6
2.3 Property rights problems that influence property evaluation .....	7
2.3.1 Property rights not clearly defined .....	7
2.3.2 The problem of common property.....	8
2.3.3 Public vs. Private property .....	8
<b>3. THEORETICAL FRAMEWORK: PROPERTY EVALUATION</b>	
<b>METHODOLOGIES .....</b>	<b>11</b>
3.1 COASE Theorem (Nobel Prize in Economy, 1993).....	11
3.2 Valuation Methods .....	11
<b>4. PROPERTY RIGHTS IN ALBANIAN CONTEXT AND EVALUATION</b>	
<b>PROBLEMS OF PROPERTY DURING TRANSITION.....</b>	<b>16</b>
4.1 History of property reforms conducted in Albania.....	16
4.2 Methodology of property evaluation in Albania .....	17
<b>5. RESEARCH METHODOLOGY .....</b>	<b>20</b>
5.1 Research Methodology .....	20
5.2 Empirical Model Set up.....	20
<b>6. RESULTS AND ANALYSIS .....</b>	<b>23</b>
6.1 Descriptive statistics .....	23



6.2 Correlation Analysis .....	24
6.3 MODEL 1 .....	25
6.3.1 Regression output with all variables included.....	25
6.3.2 Model 1: Model statistical properties .....	27
6.4 MODEL 2.....	30
6.4.1 Regression output with omitted not significant variables. ....	30
6.4.2 Model 2: Model statistical properties .....	31
<b>7. CONCLUSION .....</b>	<b>34</b>
7.1 Findings Summary.....	34
7.2 Implications .....	35
7.3 Limitation of the study .....	36
7.4 Further studies .....	36
<b>REFERENCES .....</b>	<b>37</b>
<b>APPENDIX .....</b>	<b>40</b>
<b>Appendix 1: Research Database.....</b>	<b>40</b>
<b>Appendix 2: Most used property evaluation approaches in literature.....</b>	<b>42</b>

## LIST OF TABLES

Table 3.1. Property Valuation Methods according (Rahman M. , 2006) i .....	12
Table 3.2. Property Valuation Methods according (Lawson, 2008) .....	13
Table 3.3. Property Valuation Methods according ` (Żróbek, et al., 2014) .....	13
Table 3.4. Property Valuation Methods according ` (Żróbek, et al., 2014) and past studies .....	14
Table3.5. Property Valuation Methods according Jefferies (2010).....	15
Table 3.6. Property Valuation Methods according Pengfei, W. (2011) .....	15
Table 5.1. Variables used for Property Valuation according past researches .....	21
Table 5.2. Variable setup on Property Valuation .....	22
Table 6.1. Descriptive Statistics .....	23
Table 6.2. Correlation statistics .....	24
Table 6.3. Regression output with all variables included.....	25
Table 6.4. Heteroscedasticity test output with all variables included .....	28
Table 6.5. Regression output with omitted variables .....	30
Table 6.6. Heteroscedasticity test output with omitted variables .....	33

## LIST OF FIGURES

Figure 6. 1. Goodness of fit of the model with all variables included.....	27
Figure 6.2. Normality test of the model with all variables included .....	28
Figure 6. 3. Goodness of fit of the model with omitted variables .....	32
Figure 6. 4. Normality test of the model with omitted variables.....	32

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# 1. INTRODUCTION

## 1.1 The context of the investigation

“If we don’t know our rights (under Constitution), then we don’t have any” (Taylor, 2004). When people talk about private property everyone seems to agree at one point: that it is very important to have private property. To ensure that property rights are guaranteed, we may refer to the Constitution of Albania, and in particular to Article 41 thereof, for the definition of this right:

*"The right to private property is guaranteed. Property is acquired by donation, inheritance, purchase and any other classical order provided for in the Civil Code. The law may provide for expropriations or definitions in the exercise of property rights only for public interests, which are permitted against a fair remuneration. "*

The property has a dual character as it is the basis of the country's economic system and a fundamental human right. Private property is one of the most important institutions of law in general, and a determining factor for the development of the economy and the well-being of society. For its own significance, she has found adjustment in every social system and constitutes one of the key elements for determining these relationships since the birth of humanity.

The right to property in Albanian Constitution is mainly governed by Articles 11, 41, 42. The regulation of this right in the first part (Basic Principles) and in Part Two (Human Rights and Fundamental Freedoms) of the Constitution indicates the importance of great is the constitutional regulation of this matter.

This arrangement also points to the dual nature of the property right: as the basis of the country's economic system and as a fundamental human right.

## **1.2 Literature Gap**

There is noted from several studies that still does not exist one best method of property valuation (Kinnard, 1966; Smith, 1986; Achon-Fischer, 1999; (Zróbek, et al., 2014; Pengfei, 2011; Rahman M. , 2006). Moreover in Albanian context there are no previous studies focused on property evaluation in terms of best methods of pricing value decision. Of course there have been some publications and references, such as “Guideline for Preparing Assessments for Real Estate Assets for Purposes of Accruing a Credit from a Financial Institution” (Bank\_of\_Albania, 2013), law nr. 133/2015 for property treatment and completion of the property compensation process (LAW\_Nr.\_133, 2015), The draft law "On the re-evaluation of immovable property" (Albanian\_Parliament, 2016), etc.; but they have been only in guideline levels and not in scientific research form. This double literature gap (national and international literature) identifies the importance and relevance of developing this theme.

## **1.3 Aims of the investigation**

Based on the above research gap and topic relevance, in this research there are addressed three main questions:

- Which are the most used property valuation approaches used in literature?
- Which is the mostly common and applied method of property evaluation?
- Which are the most important factors to consider when doing property valuation?

## **1.4 Research Objectives**

Based on research questions, the three objectives addressed on this paper are: (1) to explore the valuation approaches used in global literature, in order to identify the best approach, (2) to explore the method of property evaluation used and applied in reality, in order to identify the best approach, (3) To explore and identify the most important factors that influence property valuation process and price level.

## **2. LITERATURE REVIEW**

### **2.1 Property – Global Problem**

#### ***2.1.1 European Union and properties***

In European Union convention, there is a special Article (Article 1 "Protection of Property"), according to which any natural or legal person has the right of respect toward his property (Habil, Schmid, & Hertel, 2005). No one should be deprived of his property, except for reasons of public benefit and under the conditions laid down by law and the general principles of international law. The foregoing provisions do not affect the right of states to enforce the laws they deem necessary to provide for the payment of taxes or other contributions or penalties (Subbarao, 1964).

#### ***2.1.2 USA***

According (Calhoun, 2002) there are two main references for property evaluation in USA: house price indexes and automated valuation models. This paper explores the wide spectrum of methods used in property evaluation. From this explorative research it emerges that: (2) Data quantity and quality are critical to the successful development of an HPI or AVM model. It is a must to have data sharing, cross data and data comparisons are necessary for proper property evaluation. Data standardization is the most difficult task in property evaluation approach. Statistical methods are skeptically viewed and manual property evaluation is more widely accepted in institutional contexts.

From this search it is possible to conclude that in USA the discussion on property evaluation methods, on contrary of other countries is not in the level of institutional basis, but rather on statistical methods and their application in practice.

### **2.1.3 China**

In China, efforts have been made to adopt a key principle of capitalism such as the constitutional protection of private property. Millions of Chinese have implemented the principle of long-term private ownership (The Law Library of Congress Global Legal Research Center, 2014).

While the land is owned by the Government and has many control actions in the key industry, more and more middle-class members are buying homes and shares. They have strong reasons to fear about the lack of protection or guarantee of their property(Xinhuanet, 2014). The explosive development of Beijing and other cities has been accompanied by corruption scandals in conditions where Communist Party officials who control land use rights. Failure to protect the rights of the owner classes brought quite a political risk.

### **2.1.4 Germany**

(TEGOVA, 2010) In their study “Country-Specific Legislation and Practice”, The European group of values associations, states that the number of organizations that handles the property evaluation approach in Germany is very large. For example the gross income that these institutions have managed to achieve in 2010 is 110 billion Euros. Legally, all the process of property evaluation in Germany is managed by Federal Building Code (BauGB). Moreover, there exists a dedicated market area for each German property type. The above data indicate that the property evaluation in Germany is very specialized, compared with other countries in the world.

## **2.2 Conceptual definitions**

### **2.2.1 Property Right**

In reality, people cannot do whatever they want with their assets. Properly, a property right is a set of rights to engage in specific activities if the owner wants, but these rights may also force a group of responsibilities (Kinsella, 2001). Thus, possession of a part of property does not give the owner the right to do whatever he wants with this property. The real estate right is just a right to do certain things and besides these rights, the owner also has certain responsibilities (Schultz & Perzanowski, 2016). Thus, the responsibility to pay the company's taxes arises simultaneously with the acquisition of the right of ownership as it is at the same time the responsibility to keep the property under certain conditions. If we were to take the example of a car, we would understand that property rights are limited and not



absolute. Thus, the owner has the right to drive his car in certain places, but this car must be kept in certain standards, car taxes must be paid and the car owner must comply with traffic laws. The owner in question has the right to use public roads, but he has no right to walk a hundred miles an hour on the highway (Sprankling, 2000).

Property rights are rights that engage only in certain types of behavior. In this sense, they do not differ from other types of rights, such as the right to free speech, the right to hold weapons, and so on, rights which also have limitations as far as the mode is concerned how these rights can be executed.

A property right is the exclusive authority to determine how and by whom a particular source is used. More broadly, property rights can be seen as a bundle of separate rights over a certain asset - including at least the right to personal use, the right to claim compensation as a prerequisite for its use by individuals others, and the right to transfer any or all of these rights to others (Grigg & Hossein, 2016). Property rights can be exercised by the government through its officials (public property or public property) as well as by private individuals and other types of non-governmental organizations (private ownership). So we would classify property rights as:

- Private
- Common
- Public
- Absent (open access)

Natural resources in very rare cases are privately owned.

What we often refer to as property is actually access or right over a range of benefits from a set of resources.

Property rights determine the relationship between the participants in an economic and social system (TREBILCOCK, 2012). Holding a property right is an expression of the relative power of the owner. Property rights are a function of what others are willing to know. Restrictions on the actions of an owner result from the beliefs and rights of others as well as by the formal sanctions and obligations from the law. The boundary between the obligation and the law is variable. Laws and rules usually reflect the values held by a sufficient number of people in a social group.

Property rights will be compared to a stack of sticks, each stick showing a right or set of benefits (Segal & Whinston, 2010). Some important rights of a landowner would include the right to sell, lease, pledge, donate, share, etc. But the community also has a bunch of rights, such as taxes, access and use for public purposes, and so on.

The wealth with a few words is:

- Right to use
- Right to Exit
- Right to break

Ownership and secure property rights are the most important institutions to provide incentives to create, maintain, and improve assets. The lack of these elements in the eastern European socialist countries weakened the incentives to keep and manage assets.

### ***2.2.2 Transaction cost and property right***

In situations where there is a small number of participants, individual exchanges may be used as a reference to allocate resources efficiently because transaction costs are low. In situations with a large number of participants, such exchanges become virtually impossible because of the high transaction costs. In this case, the government's active role should be to control the behavior of all possible contenders with undefined ownership rights (William, 2008).

In the case of the large number of participants in the transaction, the government should consider economic efficiency in determining the right to property, while in the case of a small number of individuals involved, economic efficiency is a less critical factor. The Coase theorem suggests that when the number of people involved is small and transaction costs are low, resources can be efficiently allocated with minimal government intervention (Crosby, 1999). If the government is involved in the assignment of property rights, honesty should play a greater role in the small number of participants because once ownership rights are set, individuals can resolve the allocation of resources between each other.

In the case of a large number of people involved in the transaction, such transactions are not possible, and anyone who has been assigned rights by the government is likely to keep it. Thus, in the case of a large number of participants, allocation of resources depends on the assignment of property rights due to the significant transaction costs involved, which violates the basic assumption of the Coase theorem.

## **2.3 Property rights problems that influence property evaluation**

### ***2.3.1 Property rights not clearly defined***

If ownership rights are not well-defined then individuals will have the opportunity to use these resources without paying for them, which may lead to resource allocation problems. People would use resources without paying for them, they would not have incentives to maintain the use of these resources. Moreover, if the resources were earned without paying for them, there would be no incentive to produce these resources because there would not be a market for their exchange (Gyourko & Voith, 2001).

Air pollution is the classic example of the resource allocation problem that is created as a result of undefined property rights. The real problem that creates great air pollution is ownership rights for the air, because these rights are not clearly defined (JEFFERIES, 2010; Gyourko & Voith, 2001). Thus, factories and automobiles pollute the air without thinking of the cost that their activities cause to others. Pure air is a rare and valuable resource, but because no one has clearly established rights as far as pure air is concerned, everyone has an incentive to use as much of it as possible. If the right to ownership of the air would belong to someone, then the plant would have to buy the right to air pollution and would acquire those rights to the point where the additional pollution benefits would be equal to the additional costs that would they had to be paid for pollution. But because no one owns the air, the plant pollutes until the additional benefits of additional pollution go to zero, and thus creates a lot of pollution. Without any mechanism to ration its use, pure air, a rare and valuable source, has been overused.

In the same way, and the same analysis would be done for water pollution, noise, wildlife hunting, and a host of other problems.

*The key to all of these cases is the unclear definition of property rights*(Kummerow, 2003).

If the ownership of the air or water would have been clearly defined and if these rights were sold and sold in the market, such as land rights, labor, and other rare resources, there would be an incentive that these rights to resources be purchased by individuals who appreciate them more (McAllister, Bowles, & Tarbert, 1997).

Often, the rights of ownership remain not clearly defined, because even if they were clearly defined, it would be very difficult for them to apply. If the ownership rights would be difficult to apply, then there would be likely that they remain not clearly defined, but, even in these cases, the rights of ownership clearly defined will have a low profitability if they

were not implemented. Thus there is a close relation between the ability to implement an ownership right and the possibility that this right to be clearly defined.

### ***2.3.2 The problem of common property***

The COASE theorem explains how resources can be efficiently distributed from the point of view of incentives that exist for individual exchanges.

The COASE theorem states that resource allocation is independent of assignment of property rights in the absence of transaction costs, but problems may arise when entering into clearly defined right transactions (Sprankling, 2000). If some resources are common property, which means that everyone has ownership interests, in theory all owners may agree to sell their property to a single individual who may have the incentive to maximize the value of this property. When joint owners are unable to make such a deal, transaction costs are too high to be implemented, which is a hindrance to implementing the COASE theorem.

### ***2.3.3 Public vs. Private property***

Joint ownership implies that all owners have the right to use the source and cannot exclude any other owner. When a resource is "together", all owners have the urge to overuse the source.

Common ownership is the third category of property (apart from private and public property) (William, 2008). Common ownership consists in benefits that rejoice together. Grazing in public land or fishing in open seas are examples of different types of common property, sharing the benefits between the public and the private. Common ownership may be more controversial and complicated because groups or individuals have different views on how to handle the source.

However, it is important to say that the more robust the property right structures, the higher the levels of economic efficiency, because private law institutions create an incentive for increased efficiency of the use of resources. Ownership of resources by the government is not the same as common ownership. In joint ownership, the use of shared resources is feasible for all the common owners, which involves the problem of over-utilization. When the owner is a state, access to these resources owned by the state is controlled by the latter. We own state, access to these resources is controlled by the government (Becker, 1969).

The problem of joint ownership does not exist with state resources, although government policies may, in certain cases, allow the over-utilization of these resources by certain individuals. In private ownership, supply and demand forces interact with markets to determine how resources will be used. In the case of state ownership, the government decides, which implies that the problems will be resolved by the state bureaucracy or perhaps by the legislature (LaSalle, 2013). In this case, the value of costs and benefits will be decisive, but these government sources will be allocated in proportion to the political pressure that different parties may have on the problem.

Owning the state, the costs and the economic benefits of using resources are not as important as the market, while the political costs and benefits of government decision-makers are crucial (Schumann, 2006). Intense lobbying on either side can bring about changes. However, it is important to note that when resources are under the ownership of the government, there is rarely a viable victory. When resources are owned by the state, the parties concerned will constantly fight to keep control of these resources. Here is also the change with private property, which, once sold immediately, the owner of this property is able to permanently dictate how his property will be used.

Article 11 of the Constitution states:

1. The economic system of the Republic of Albania is based on private and public property, as well as in the market economy and the freedom of economic activity.
2. Private and public property is protected by law.
3. Restrictions on the freedom of economic activity may be imposed only by law and only for important public reasons.

As seen from this definition, the Constitution bases the economic system on two types: private property and public property. Both of these types of property are equally protected by the law. This equal protection is of utmost importance. It reflects the detachment from the system of socialist economy, where public property is the dominant form and is an indicator of the market economy system to which our country is oriented. It is important to keep in mind that private property exists along with public property. The right to private property can be enjoyed by legal and physical persons, but the state may also have ownership over certain properties (Hilbers, Zacho, & Lei, 2001). It is important for the economy of a

country and for its economic and social development, to have different forms of ownership. To think for a moment about our previous system, you will realize that this system considered all property as a common property, meaning "anyone's property" or "everyone". Here we will consider the 1976 Constitution, according to which properties in Albania are considered State-Owned. If the private property was not recognized by the Constitution (as it has not been known before, since the "Private Prone" concept did not exist) and would not be reflected in other laws, its absence would allow and encourage theft, misuse of property and creates obstacles to the development of the country.

The right to private property is seen as a fundamental human right, which deserves special protection and guarantees (Kummerow, 2003). What guarantees is of two importance:

Firstly, this allows private property owners over material goods that are not legally reserved to public entities; second, it guarantees every private owner from any arbitrary state power. But the state must also protect the owner from other individuals who violate his property right.

An important concept in the case of property rights is that of expropriation. It is understood that the law may provide for expropriations and restrictions on the exercise of property rights (LaSalle, 2013; William, 2008). Expropriation can only be done for a legitimate public interest. These interests are the only cause for which the law can foresee expropriation. Expropriations must always be made with reward, as an instrument that restores the economic equilibrium between the expropriating state and the expropriated individual. The Constitution has determined that the reward must be fair. Thus, it emphasizes the need to take into account the achievement of a balance between the individual and the public interest, but also provides for the right to complain about the amount of remuneration, Articles 11/3, 41/4, 41/5 and 44 of the Constitution.

### **3. THEORETICAL FRAMEWORK: PROPERTY EVALUATION METHODOLOGIES**

#### **3.1 COASE Theorem (Nobel Prize in Economy, 1993)**

The COASE theorem states that in the absence of transaction costs the allocation of resources will be independent of the assignment of the right of ownership. This implies that when there is nothing to stop the existence of a potential profit trading, trade will exist and the resources will be allocated according to their most valued uses. COASE states that there are no transaction costs no matter who is entitled to ownership (Lawson, 2008). The person to whom this right is most valuable will be willing to buy the right and the exchange will take place at a low transaction cost.

Individuals will therefore enter into exchanges to acquire ownership rights from others when they value these property rights more than their previous owners. In this way, at low transaction costs, resources will always go to their most valued use, regardless of who owned the initial right of ownership.

There are no legal barriers, strategic barriers or barriers to entering the market, and so the property rights are clearly defined, then people can always negotiate for an efficient product.

#### **3.2 Valuation Methods**

(Rahman M. , 2006) in his paper ``Development of Valuation Model for Residential Property, integrating Self- declaration`` has classified valuation methods in five categories: Market value comparison approach, Income capitalization approach, Cost approach, Rental Value Assessment, and Mass appraisal Evaluation. In the following, table are explained in detail elements of each valuation approach.

Table 3.1. *Property Valuation Methods according (Rahman M. , 2006) i*

<b>METHOD</b>	<b>Valuation Steps/ Approach</b>	<b>Explanation</b>	<b>Limitations</b>
Market value comparison approach	Analysis of the property under consideration	Variables taken into consideration: use and potential uses, characteristics of the land, location factor, market trends, regulations and restriction affecting the property	Depend on the number of market transactions that can be used during the analysis .
	Selection of comparable properties	Selection criteria: price data, listings or offers to sell, offers to purchase, and rentals	Lack of the accuracy of source data (sale prices)
Income capitalization approach	Gross income = total possible income at cent percent occupancy of the building - vacancies - collection loses.	Measures the present value of the future benefits of property ownership.	
	Expenses are estimated, including allowances for replacement.		
	Capitalizing the net income resulting from the deduction of estimated expenses from gross effective earnings.		
Rental Value Assessment		Property is assessed according to estimated (not actual) rental value or net rent.	Gross rents are often used rather than the economically relevant "net" rents that build in an allowance for maintenance expenditures, insurance costs, and other expenses.
			Most countries tend to assess rental value on the basis of current use.
Mass appraisal Evaluation	Specification of the General Model- a framework to simulate supply and demand forces operating in a real estate market and inadaptable to many uses.	A systematic valuation of groups of real estate units performed on a certain date with the help of standard procedures and statistical analysis while individual valuation is focused on determining the value of individual property units.	The lack of personnel to make field inspections of each property means that verification is inadequate and it can make difference.
		(UNECE, 2001; Bagdonavicius and Ramanauskas, 2004; (Eckert et. al., 1990)	

(Lawson, 2008) in his study, "Theory of real estate valuation", has acknowledged, as the table below states that there are three valuation approaches available: Market Inference, Income Method and Cost Method.



Table 3.2. *Property Valuation Methods according (Lawson, 2008)*

<b>METHO D</b>	<b>Valuation Steps/ Approach</b>	<b>Explanation</b>	<b>Limitations</b>	<b>Advantages</b>
Market Inference	Choosing which sales are best to use to infer price	What price can be inferred from markets behaviour.		
	Identifying price-affecting characteristics that differ between sales and the subject property			
	Estimating the dollar value of the differences for each pair-wise comparison of the subject sale			
	“Reconciling” to give a single price estimate, where indicated values of the subject from different adjusted comparable sales are not identical			
Income Method		This method simulates or mimics the behaviour of buyers and sellers when making calculations to buy or sell based on financial criteria.	These latter models although used by many institutional investors are not commonly used by all but provide useful refinements for the analyst.	Financial models based on market simulation are relevant where a property is leased or capable of being leased and there is an absence of sales transactions from which to draw an inference of price.
Cost Method		A calculation of the cost of replacement		

This author states that there are three papers/ institutions that address the problem of process valuation: (1) Australian Property Institute Professional Practice 2000 Manual, (2) The Appraisal Process AIREA textbook The Appraisal of Real Estate and (3) Lusht Appraisal Process (1997). In 2014 has been published a research from several authors, Żróbek, Kucharska-Stasiak, Trojanek, Adamiczka, Budzyński, Cellmer, Sajnog (2014), named: “Current problems of valuation and real estate management by value” (Żróbek, et al., 2014). According to this paper, there are three valuation methods: American School, British School, and the German School. Deduction from this paper is given in the following table:

Table 3.3. *Property Valuation Methods according` (Żróbek, et al., 2014)*

Valuation Schools	The American	The British	The German School
Valuation Approach	<b>Three</b> approaches simultaneously	<b>Two</b> approaches simultaneously	<b>One</b> approach
Determination of value	The <b>cost approach</b> has just a <i>supportive</i> role	The cost approach is <i>applied</i> to the valuation of real estate	The cost approach is a <i>priority</i>
Sources of origin of valuation data	Market evidence <b>informal</b> research	Market evidence <b>informal</b> research	market evidence gathered from <b>notarized</b> deeds
Disclosure of valuation data	<b>Fully</b> disclose	<b>No</b> data disclose because real estate transactions do not constitute public property	<b>Only aggregate</b> data is covered by the Information Protection Act
Interpretation of market value	Market value (Novelli, Procter 1992)	Market value (Novelli, Procter 1992)	Current market value Long-term value
Valuation methodology principle	Searching for value with the assumption of the optimal use (highest and best use)	The “hope value” principle which allows the estimation of market value without meeting the conditions of compliance with the local area development plan	Two types of value: free market value with the existing use (real estate as assets), and the free market value with an alternative use (alternative uses and possibility of redevelopment)

Moreover, these authors have concluded on the historical basis of valuation approaches, as the following table indicate.

Table 3.4. *Property Valuation Methods according` (Zróbek, et al., 2014) and past studies*

Historical Period	Characteristics
1900-1940	- Relatively simple calculations
	- First academic curricula on real estate valuation
	- First valuation manuals (F. Babcock, the author of the first American publication on valuation)
	- Capitalization rate calculation problem
	- <b>Income approach</b> was preferred
1950-1960	- Basic definitions were improved
	- value was defined as the most probable price
	- <b>Capitalization rates</b> were distinguished for stable and growing income (reflect risk).
	- Was accepted that rates of return in the real estate market remain directly connected with rates of return in the capital market.
From mid 1960s to the beginning of the 1980s	- The period of new methods and techniques
	- The <b>discounted income technique</b> was promoted
	- The concept of simple capitalization was rejected
	- The <b>capitalization theory</b> was improved
	- The electronic calculators were more and more widely in US
Second half of 1980s and lasting until today	- Period of computers and the Internet
	- Easy communication and access to market data
	- Development of <b>automated valuation models</b> (MILLER, MARKOSYAN 2003)

Meanwhile, Jefferies (2010) has classified valuation approaches in two broad categories: conventional and real value ones (please refer to the following table).

Table 3.5. *Property Valuation Methods according Jefferies (2010)*

Characteristics	CONVENTIONAL MODELS	REAL VALUE MODELS
Author	Future income will be received in future nominal currency (net cash flows and net terminal values).	inflation free real yield (IFRY) as a “true yield” – Presented by Wood (1972).
Disadvantages	Require implicit or explicit allowance for inflation incorporated in the overall nominal growth assumption, and DFC (nominal yield or discount rate).	
Advantages		Generic real value capitalization models require implicit or explicit allowance only for real rental growth, inflation is not allowed for and future real cash flows, including real growth, are discounted at an inflation free real yield (IFRY) or net of inflation yield or discount rate.
Operating expense	Are allowed for by capitalizing their current costs at a nominal overall capitalization rate.	Are allowed for by capitalizing the current real costs at a real capitalization rate.
Capital expenditure	Are calculated by discounting their future forecast nominal CAPEX costs at nominal discount rate.	Are calculated by discounting their current real CAPEX costs at a real discount rate.

Pengfei, W. (2011) states that there are three valuation approaches: (1) cost approach, (2) sales comparison approach and (3) income capitalization approach.

Table 3.6. *Property Valuation Methods according Pengfei, W. (2011)*

	DEFINITION	
Cost approach	Value = Estimated land value + current cost of replacing cost of the improvements - depreciations	
Sales comparison approach	A set of procedures in which a value indication is derived by comparing the property being appraised to similar properties that have been sold recently, applying appropriate units of comparison, and making adjustments to the sale prices of the comparable based on the elements of comparison	
Income capitalization approach	A set of procedures through which an appraiser derives a value indication for an income-producing property by converting its anticipated benefits (cash flows and reversion) into property value.	

## **4. PROPERTY RIGHTS IN ALBANIAN CONTEXT AND EVALUATION PROBLEMS OF PROPERTY DURING TRANSITION**

### **4.1 History of property reforms conducted in Albania**

From 1912 to 1991, Albania has passed between three economic systems: feudal, free market and communist regime (Rama, 2013).

#### **- Period from the proclamation of Independence until 1945**

In the years between the declaration of Independence of Albania (1912) and communist years (1944 - 1990), the new Albanian state was in the process of trying to get rid of the feudal system. It did so by creating a democratic and capitalist property management system (KOPRENCKA, 2011). Through two special agrarian reforms, one in 1924 and the other in 1930, the Albanian state tried to pass the land ownership by the wealthy landowners to the then-populous peasants, which accounted for 90% of the population.

#### **- Communist period:**

With the rise of the communist regime, the situation changed again. In 1945 Agrarian Reform was approved, which had the power to expropriate the land from wealthy owners and religious institutions and redistribute them to the peasants. The principle was "The earth belongs to the one who works". This reform eliminated the economic base of feudal relationships in the village and transformed the class structure. Within the year, land owned by wealthy owners declined from 52.3% to 16.4% (Albania, 1998: SEMINAR ON URBAN RENEWAL AND HOUSING MODERNIZATION, 1998).

#### **- Collectivism:**

A year later, in 1946, the state proclaimed a legal decree titled "On Establishing Cooperatives". This was the first major step towards the collectivization of the state.

Within the first few years, 150 agricultural cooperatives were created. The final step of this collectivization was an increase in the size of the cooperatives and their number. In 1983 there were 143 cooperatives, making Albania one of the most collectivized and centralized countries in Europe. The history of Albanian communism reached its peak with the adoption of the 1976 Constitution, which eliminated all the private property of land and immovable property.

**- Post-communist period:**

After the fall of the socialist system, around 1989 and 1991, the democratic principles and the market economy began to emerge on the surface. Of course, one of the first issues, but not the most important of the new democracies, was the return of land to private property (Rama, 2013). Since the fall of communism in the early 1990s, Albania adopted laws related to the restitution and compensation of property to former owners. However, even after 12 years, due to the challenges to the legality and impartiality of these laws, Albania has not yet resolved the property issue in the right way. In attempting to resolve this problem, the 1998 Constitution, in its Article 181, states that the Assembly should issue "laws regulating various issues related to expropriations and seizures committed after the adoption of this Constitution". Just before the expiration of the constitutional term on November 2001, the Council of Ministers adopted several amendments to the two main laws on restitution and compensation. A separate parliamentary commission was then set up to review these draft-law amendments, and the work was originally supposed to be completed by the end of November 2002. However, both government and Ad-Hoc's efforts have been fruitless. They have not yet been able to find a solution to delicate issues such as: how will the most costly compensation of property that cannot be repaid or compensated in kind (in particular agricultural land)? How will be assessed for compensation purposes; what will be done in certain areas of the country that have never implemented the legislation in force and object to it.

## **4.2 Methodology of property evaluation in Albania**

### **The case of Ex- Owners**

The method for determining the value of the property that is compensated applies only to the determination of the price of the property which cannot be returned to the owners. Property to be compensated, according to the law on restitution and compensation of

property, will be valued at market price. The Assembly will approve the methodology in principle, while the calculations for the determination of land prices (agricultural, land, seafont) for the different areas will be made by the SCRC experts. Approval of this methodology is expected to give an answer as to how much it will cost the property compensation process in Albania.

EU negotiators have called for property restitution and compensation as one of the most important and priority processes for Albania's integration into the EU. The EU has set concrete tasks for Albania in the framework of the process of restitution and compensation of property. According to the EU, in any case the Albanian government should as soon as possible make available all the information necessary to determine the free land for return and compensation. It should identify unsuccessful refund and compensation claims and draw up a financial plan to cover the potential cost of compensation. On the other hand, in the last EU report for our country it was stated that "in relation to the restitution and compensation of properties seized during communist times, the Albanian government has not yet made transparent the fund of public land free, as well as the financial bill. It has not yet published any reliable platform for respecting the financial bill. "

### **The case of Agricultural Land**

Agricultural land valuation will be made on the basis of the annual land profit calculation. On the basis of this profit will be calculated the price of the land through the capitalization of the profit.

- Determination of planting structure - based on the statistical year of the Ministry of Agriculture and Food
- Evaluation of production - revealing the relationship between the productivity and the internal qualities of the external factors of the earth. Based on the estimation of production, the lands are divided into five groups.
- Net earnings estimate - which is equal to income (production multiplied by market price) by subtracting profits.
- Potential land price - which is equal to net profit divided by the percentage of banking interest.

Since the lands are of different qualities, then for the estimation of the land will be used a reduction percentage of agronomic skills. In addition to these factors, land value is affected by other factors such as irrigation, distances from industrial or tourist urban centers,

development and perspectives of the economic and social development of the area and land use.

Formula: Land price for compensation = [(100x net profit)% of bank interest] x land consolidation coefficient x development coefficient x exploitation coefficient.

### **The case of forest land, pastures, forests**

Forest land - will be evaluated with the same method for agricultural land

Livestock and pasture - will have the same value as the agricultural lands of the fifth category.

The value of the productive forest - will be determined taking into account the wood volume and the qualities of the land under the forest.

### **Evaluation of land for construction**

Method I - Land valuation for compensation is based on market prices according to the data of the real estate agencies or real estate registration offices (mortgages). But due to the lack of regulatory plans of the majority of cities and the lack of accurate sales data, there is no known market for construction sites.

Method II - Land Build ability

According to this method in determining the price of the land are taken into account:

Construction coefficient (K) - equal to the area ratio constructed with the surface of the plot  
 $K = 1.2$  to  $2.5$  square meters of building per square meter of land.

The percentage that the owners take (P) = 15 to 35 percent of the building

Average Selling Rates (Cm)

The value of the plot is equal to  $K \times P \times C_m$

In addition, other factors that affect the change of this value should be taken into account.

These factors are:

Reduction coefficient between assessment time and compensation time

The parking coefficient (which has a lower value than the apartments)

Coefficient of commercial floors (which have higher value than the value of the apartments).

However, even after these attempts, property problems seem to have failed. Even though they have a representative at the State Committee for Restitution and Compensation of Property, the owners' association is open against the Methodology for compensation prices approved by the parliamentary commissions as well as the law "On Restitution and Compensation of Property"

## **5. RESEARCH METHODOLOGY**

### **5.1 Research Methodology**

The data used in this research are quantitative. Methodological approach will be the usage of objective quantitative, which will be analyzed using statistical methods. Data are gathered from two real estate agencies that operate in Tirana. Total number of units (apartments) for which are gathered data regarding their characteristic is 50. Although the small sample, this number of apartments was considered satisfactory after a preliminary statistical analysis (satisfactory levels of statistical significance).

### **5.2 Empirical Model Set up**

In order to choose the most important variables to be used in this research, an in-depth literature review of the last decade was conducted. The authors which have used linear regression to estimate the value of property, have used the following variables



Table 5.1. *Variables used for Property Valuation according past researches*

Author	Variables
(Rahman, 2006)	Qualitative data: i. Type of property, ii. Nature of Construction: (a) building, (b) pucca (without concrete roof), (c) tin shed (only basement is brick built) (d) kutcha (no brick is used), iii. Condition of building Quantitative data: i. Number of storeys, ii. Number of rooms, iii. Number of bath-rooms, iv. Total floor space, v. Date of valuation, vi. Annual rentalvalue
(Pengfei, 2011)	Annual value Number of Rooms Number of Bathrooms Total Floor Area Number of Storey Nature of Construction Condition of Building Date of Valuation
(Żróbek, et al., 2014)	Location/ surroundings The right to land Technical condition Transport access Transaction price Usable area Floor Functionality Associated rooms Transaction date

Based on the above, and on the data available on the real estate database contacted for this research purposes, the empirical model used in this research is:

$$Y = X_1 + X_2 + X_3 + X_4 + X_5 + X_6 + X_7$$

Where:

Y- Selling Price

X<sub>1</sub> Age of building

X<sub>2</sub> - Floors

X<sub>3</sub> - Nearness to facilities

X<sub>4</sub> - Parking facilities

X<sub>5</sub> - Number of rooms

$X_6$  - Total floor space

$X_7$  - View from property

A summarized table for the above model and variables used in the study is showed below:

As noted above, this equation is constructed in order to estimate the selling prices of apartments. This selling price which, is the price under which the apartment selling transaction takes place, is evaluated from literature to be determined by several elements: Age of building, Floors, Nearness to facilities, Parking facilities, Number of rooms, Total floor space, View from property.

Table 5.2. *Variable setup on Property Valuation*

VARIABLE	TYPE OF VARIABLE	MEASURE	Explanation of the variable
Selling Price	Depended Variables	Quantitative	The price under which the apartment selling transaction takes place
Number of rooms	Independent Variable	Quantitative	Number of rooms that the apartment has.
Age of building	Independent Variable	Quantitative	Number of years since the apartment has been build.
Floors	Independent Variable	Quantitative	Number of floors that the apartment has.
Total floor space	Independent Variable	Quantitative	M2 of space that the apartment has.
View from property	Independent Variable	Qualitative	Qualitative variable where the participant in the research is required to evaluate from 1 (best) to 5 (worst) the apartment in terms of view from property.
Parking facilities	Independent Variable	Qualitative	Qualitative variable where the participant in the research is required to evaluate from 1 (best) to 5 (worst) the apartment in terms of parking facilities.
Nearness to facilities	Independent Variable	Qualitative	Qualitative variable where the participant in the research is required to evaluate from 1 (best) to 5 (worst) the apartment in terms of nearness to facilities.

Data for these variables are gathered from two real estate agencies located in Tirana (Database is presented in the annex of the research).

This regression may be estimated as a **Hedonic pricing** is a model, given that it expresses the price of the assed as impacted by both: internal and external characteristics of the asset.

## 6. RESULTS AND ANALYSIS

### 6.1 Descriptive statistics

In the below table some of the most important descriptive statistics indicators are showed.

Table 6.1. *Descriptive Statistics*

	SELLING_PRICE	FLOORS	NEARNESS_TO_FACILITIES	PARKING_FACILITIES	ROOMS_NUMBER	BUILDING_AGE	TOTAL_FLOOR_SPACE	VIEW_FROM_PROPERTY
Mean	9937417.	88.24000	6.900000	3.100000	1.180000	1.840000	1.920000	1.940000
Median	9184000.	86.00000	4.500000	3.000000	1.000000	2.000000	2.000000	2.000000
Maximum	29622330	160.00000	15.000000	6.000000	2.000000	3.000000	3.000000	3.000000
Minimum	3600000.	50.00000	2.000000	0.000000	1.000000	1.000000	1.000000	1.000000
Std. Dev.	4865566.	22.77177	5.191241	1.775686	0.388088	0.738448	0.804071	0.842978
Skewness	1.803400	0.561591	0.867533	0.112671	1.665853	0.257533	0.143903	0.112825
Kurtosis	7.128520	3.556748	1.910990	1.737487	3.775068	1.896644	1.591368	1.444784
Jarque-Bera	62.61184	3.273973	8.742498	3.426497	24.37709	3.088933	4.306408	5.145031
Probability	0.000000	0.194565	0.012635	0.180279	0.000005	0.213426	0.116112	0.076343
Sum	4.97E+08	4412.000	345.0000	155.0000	59.00000	92.00000	96.00000	97.00000
Sum Sq. Dev.	1.16E+15	25409.12	1320.500	154.5000	7.380000	26.72000	31.68000	34.82000
Observations	50	50	50	50	50	50	50	50

If we compare central tendency indicators with dispersion indicators, it results that building age of apartments is the only variable with high dispersion (high St. Dev. Value), while all the other variables have negligible dispersion values (Low St. Dev. Value). This indicate that data are homogeneous in terms of all characteristic of apartments, except for the age of building.

Moreover if we evaluate Skewness and Kurtosis values, it results that they are near the value of zero, except for the age of the building variable. This shows that all variables, except the age of the building are normally distributed.

## 6.2 Correlation Analysis

In the following table, is presented the output of the correlation analysis conducted for the variables of interest in this paper.

Table 6.2. *Correlation statistics*

	BUILDING_AGE	FLOORS	NEARNESS_TO_FACILITIES	PARKING_FACILITIES	ROOMS_NUMBER	SELLING_PRICE	TOTAL_FLOOR_SPACE	VIEW_FROM_PROPERTY
BUILDING_AGE	1.000000	0.526565	-0.269398	0.015143	0.150774	-0.156710	0.106930	-0.136963
FLOORS	0.526565	1.000000	-0.592459	-0.147476	0.581570	0.109130	0.138164	-0.063023
NEARNESS_TO_FACILITIES	-0.269398	-0.592459	1.000000	0.147227	-0.304908	0.009583	0.001956	0.090006
PARKING_FACILITIES	0.015143	-0.147476	0.147227	1.000000	-0.085883	-0.329954	0.008576	0.091347
ROOMS_NUMBER	0.150774	0.581570	-0.304908	-0.085883	1.000000	-0.182303	0.112488	0.096068
SELLING_PRICE	-0.156710	0.109130	0.009583	0.329954	-0.182303	1.000000	0.046744	-0.114090
TOTAL_FLOOR_SPACE	0.106930	0.138164	0.001956	0.008576	0.112488	0.046744	1.000000	-0.127661
VIEW_FROM_PROPERTY	-0.136963	-0.063023	0.090006	0.091347	0.096068	-0.114090	-0.127661	1.000000

As may be seen, from the above table there are no traces of correlation among variables. The relationship between them will be further analyzed using linear regression analysis.

### 6.3 MODEL 1.

#### 6.3.1 Regression output with all variables included

In the following table, is presented the output of the linear regression analysis conducted for the variables of interest in this paper.

Table 6.3. *Regression output with all variables included*

Dependent Variable: SELLING\_PRICE  
Method: Least Squares  
Date: 12/28/17 Time: 09:39  
Sample: 1 50  
Included observations: 50

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.053303	0.702812	2.921553	0.0056
BUILDING_AGE	-5.74E-08	2.36E-08	-2.431763	0.0194
FLOORS	0.019414	0.007141	2.718806	0.0095
NEARNESS_TO_FACILITIES	0.020159	0.023013	0.875975	0.3860
PARKING_FACILITIES	0.126378	0.054220	2.330836	0.0246
ROOMS_NUMBER	0.859734	0.311118	2.763365	0.0085
TOTAL_FLOOR_SPACE	0.037575	0.119636	0.314079	0.7550
VIEW_FROM_PROPERTY	0.082832	0.116502	0.710997	0.4810
R-squared	0.318609	Mean dependent var		1.840000
Adjusted R-squared	0.205044	S.D. dependent var		0.738448
S.E. of regression	0.658403	Akaike info criterion		2.147647
Sum squared resid	18.20677	Schwarz criterion		2.453571
Log likelihood	-45.69118	Hannan-Quinn criter.		2.264145
F-statistic	2.805517	Durbin-Watson stat		2.187245
Prob(F-statistic)	0.017240			

From the above table it is possible to state that the final regression equation that shows the relationship among selling prices of apartments (depended variable) and Number of rooms, Age of building, Floors, Total floor space, View from property, Parking facilities, Nearness to facilities (independed variables) is:

$$\text{Selling Price} = 2.05 \text{ (p= 0.0056)} - 0.0754 \text{ Building Age (p= 0.0194)} + 0.02 * \text{Floors (p= 0.0095)} + 0.02 * \text{Nearness to facilities (p=0.3860)} + 0.13 * \text{Parking facilities (p= 0.0246)} + 0.86 * \text{Number of rooms (p= 0.0085)} + 0.04 * \text{Total floor space (p= 0.7550)} + 0.08 * \text{View from property (p= 0.4810)} \quad (R=0.318609)$$

After omitting the variables that does not have coefficient that are statistically important, the final equation gets the form:

$$\text{Selling Price} = 2.05 - 5.74\text{E-}08 * \text{Age of building} + 0.02 * \text{Floors} - 0.13 * \text{Parking facilities} \\ (\mathbf{p= 0.0246}) - 0.86 * \text{Number of rooms} (\mathbf{p= 0.0085})$$

$$\text{Selling Price} = 2.05 + 5.74\text{E-}08 * \text{Number of rooms} - 0.02 * \text{Age of building} + 0.13 * \text{Total floor space} + 0.86 * \text{View from property}$$

From the above results it is possible to conclude that:

- In overall, the variation of: Number of rooms, Age of building, Floors, Total floor space, View from property, Parking facilities, Nearness to facilities (independent variables) is explain approximately 30% of the variation in the selling prices of Apartments in Tirana.
- Variables that don't have a significant impact over the selling prices of Apartments in Tirana are: Floors ( $\mathbf{p=0.3860}$ ), Parking facilities ( $\mathbf{p= 0.7550}$ ), Nearness to facilities ( $\mathbf{p= 0.4810}$ ). Moreover variables that have a significant impact over the selling prices of Apartments in Tirana are: Number of rooms, Age of building, Total floor space, and view from property.
- An increase of number of rooms with 1 unit causes the increase of the selling prices of Apartments in Tirana by 0.00000000005 units (and conversely).
- An increase in the age of the building with 1 unit causes the decrease of the selling prices of Apartments in Tirana by 0.02 units (and conversely).
- An increase in the total floor space with 1 unit causes the increase of the selling prices of Apartments in Tirana by 0, 13 units (and conversely).
- An increase in the View from property characteristic with 1 unit causes the increase of the selling prices of Apartments in Tirana by 0, 86 units (and conversely).
- The apartment characteristics that mostly impact their selling price in Tirana, sorted in descending order are: View from property, Total floor space, Age of building, and Number of rooms.

### 6.3.2 Model 1: Model statistical properties

#### 6.3.2.1 Goodness of fit

If we compare the trend between actual data and fitted data (data estimated from the regression equation concluded from this research) it is possible to conclude that the goodness of fit, is in satisfactory levels (residuals are not in high levels) (Refer to the following table).

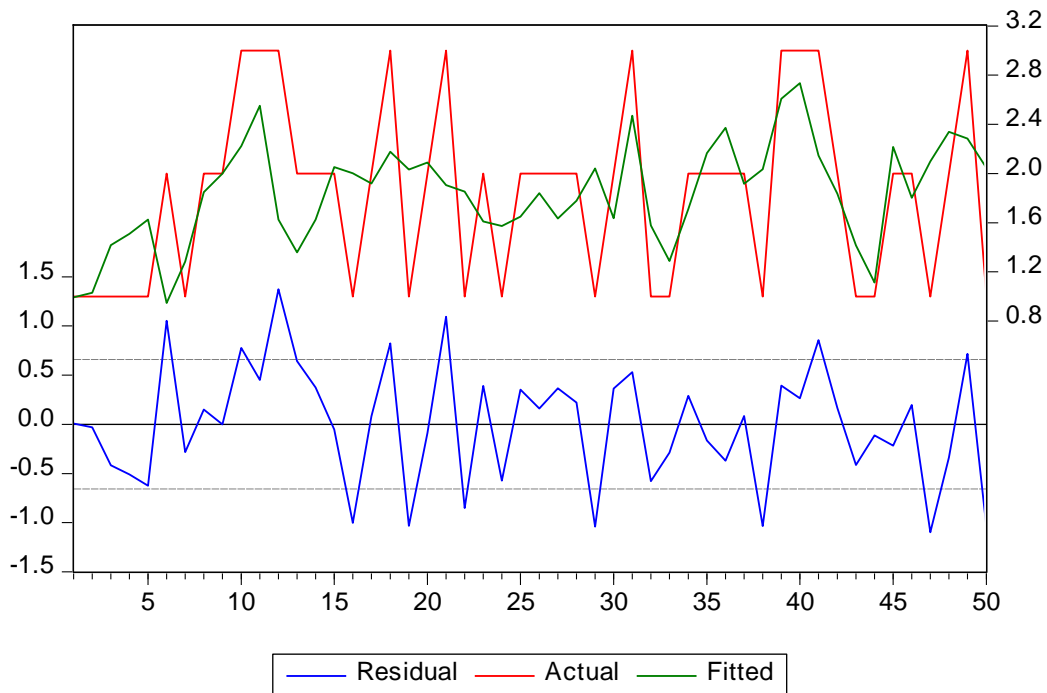


Figure 6. 1. Goodness of fit of the model with all variables included

#### 6.3.2.2 Normality test

In order to test for Normality of the data used for this research, the following hypothesis are designed.

Null Hypothesis: Data have normal distribution (i.e. skewness = 0 and excess kurtosis =0).

Alternative Hypothesis: Data have non-normal distribution.

The null hypothesis is rejected if J-B estimated coefficient > Critical value from the Chi distribution.

The hypothesis are tested from the below graph results.

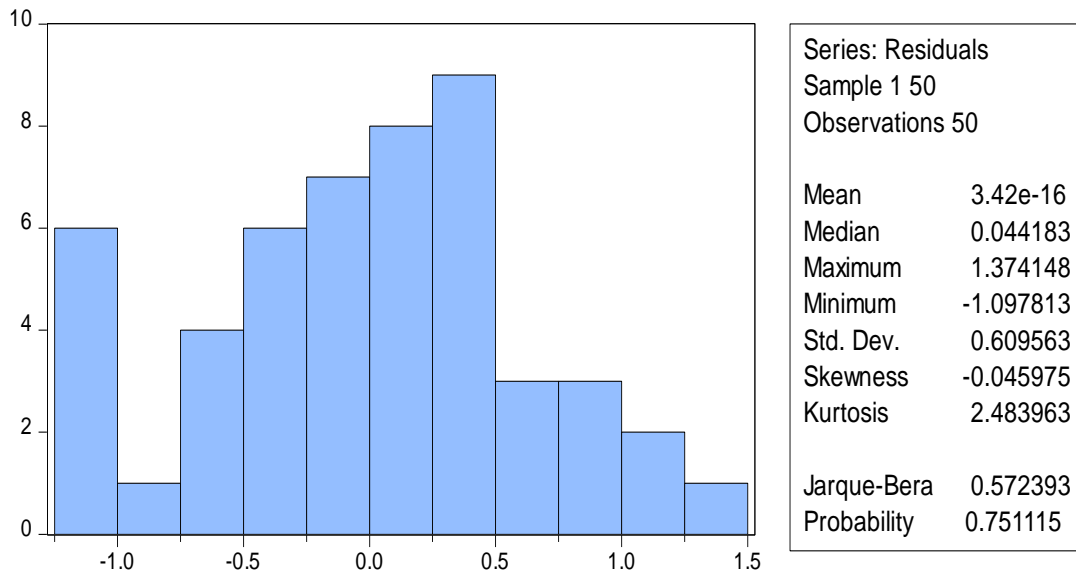


Figure 6.2. Normality test of the model with all variables included

Given that for p value = 0, 05 the critical value of Chi distribution is 4.61, we have: J-B estimated coefficient = 0,5723 > Critical value from the Chi distribution= 4.61 .

Given the above, the data are normally distributed (H0 is accepted).

### 6.3.2.3 Heteroscedasticity test

In order to test for Heteroscedasticity, in the data used for this research, the following hypothesis are designed.

Ho: heteroskedasticity,

Ha: unrestricted heteroskedasticity.

The hypothesis are tested from the below table results.

Table 6.4. Heteroscedasticity test output with all variables included

Heteroskedasticity Test: White			
F-statistic	1.143606	Prob. F(34,15)	0.4040
Obs*R-squared	36.08085	Prob. Chi-Square(34)	0.3715
Scaled explained SS	18.88985	Prob. Chi-Square(34)	0.9831

Test Equation:  
Dependent Variable: RESID^2



Method: Least Squares  
Date: 12/28/17 Time: 09:42  
Sample: 1 50  
Included observations: 50  
Collinear test regressors dropped from specification

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.648531	3.879181	-0.167182	0.8695
BUILDING_AGE^2	-3.95E-15	5.03E-15	-0.786262	0.0444
BUILDING_AGE*FLOORS	-6.19E-09	4.33E-09	-1.427487	0.0173
BUILDING_AGE*NEARNESS_TO_FACILITIES	-2.06E-08	1.12E-08	-1.836353	0.0062
BUILDING_AGE*PARKING_FACILITIES	-1.30E-08	3.59E-08	-0.361724	0.0026
BUILDING_AGE*ROOMS_NUMBER	6.77E-09	1.27E-07	0.053402	0.0081
BUILDING_AGE*TOTAL_FLOOR_SPACE	-5.25E-08	3.54E-08	-1.484733	0.0183
BUILDING_AGE*VIEW_FROM_PROPERTY	1.76E-09	5.13E-08	0.034324	0.0331
BUILDING_AGE*FLOORS^2	9.44E-07	3.34E-07	2.821545	0.0129
FLOORS*NEARNESS_TO_FACILITIES	0.000392	0.000590	0.663187	0.0173
FLOORS*PARKING_FACILITIES	0.000949	0.002397	0.395851	0.0178
FLOORS*ROOMS_NUMBER	0.007738	0.005399	1.433171	0.1023
FLOORS*TOTAL_FLOOR_SPACE	-0.006047	0.040550	-0.149125	0.0034
FLOORS*VIEW_FROM_PROPERTY	0.013446	0.011786	1.140860	0.0218
FLOORS^2	-0.004125	0.009536	-0.432586	0.0215
FLOORS*NEARNESS_TO_FACILITIES^2	-0.059669	0.075534	-0.789967	0.0419
NEARNESS_TO_FACILITIES^2	0.010252	0.010429	0.982993	0.0012
NEARNESS_TO_FACILITIES*PARKING_FACILITIES	0.002122	0.012759	0.166355	0.0301
NEARNESS_TO_FACILITIES*ROOMS_NUMBER	-0.221035	0.659243	-0.335286	0.0421
NEARNESS_TO_FACILITIES*TOTAL_FLOOR_SPACE	0.017859	0.031796	0.561670	0.0226
NEARNESS_TO_FACILITIES*VIEW_FROM_PROPERTY	-0.034248	0.024975	-1.371255	0.0005
NEARNESS_TO_FACILITIES*PARKING_FACILITIES^2	0.140139	0.696440	0.201222	0.0432
PARKING_FACILITIES^2	0.012589	0.036373	0.346103	0.0341
PARKING_FACILITIES*ROOMS_NUMBER	0.000910	0.250687	0.003630	0.0072
PARKING_FACILITIES*TOTAL_FLOOR_SPACE	0.030203	0.101948	0.296259	0.0411
PARKING_FACILITIES*VIEW_FROM_PROPERTY	-0.046062	0.066664	-0.690964	0.0001
PARKING_FACILITIES*ROOMS_NUMBER^2	-0.627525	0.431223	-1.455221	0.0462
ROOMS_NUMBER^2	0.771037	1.974291	0.390539	0.0016
ROOMS_NUMBER*TOTAL_FLOOR_SPACE	-0.266279	0.571723	-0.465749	0.0481
ROOMS_NUMBER*VIEW_FROM_PROPERTY	-0.257307	0.314453	-0.818267	0.0260
TOTAL_FLOOR_SPACE^2	0.303774	0.181230	1.676180	0.0144
TOTAL_FLOOR_SPACE*VIEW_FROM_PROPERTY	-0.056196	0.163030	-0.344699	0.0351
TOTAL_FLOOR_SPACE*ROOMS_NUMBER	-1.625562	1.097345	-1.481359	0.0192
VIEW_FROM_PROPERTY^2	-0.153550	0.202845	-0.756984	0.0008
VIEW_FROM_PROPERTY*ROOMS_NUMBER	1.887049	1.274265	1.480892	0.1593
R-squared	0.721617	Mean dependent var		0.364135
Adjusted R-squared	0.090615	S.D. dependent var		0.448086
S.E. of regression	0.427302	Akaike info criterion		1.333377

Sum squared resid	2.738808	Schwarz criterion	2.671793
Log likelihood	1.665577	Hannan-Quinn criter.	1.843053
F-statistic	1.143606	Durbin-Watson stat	2.639692
Prob(F-statistic)	0.403977		

Given that the  $P < \alpha = 0.05$ ,  $H_0$  is rejected, therefore data are not heteroscedastic. This implies that, linear regression statistic is a proper model to apply for investigating the relationship between: selling prices of apartments (depended variable) and Number of rooms, Age of building, Floors, Total floor space, View from property, Parking facilities, and Nearness to facilities (independed variables).

## 6.4 MODEL 2.

### 6.4.1 Regression output with omitted not significant variables.

From the initial empirical model,

$$Y = X_1 + X_2 + X_3 + X_4 + X_5 + X_6 + X_7$$

Where.

#### **Y- Selling Price**

$X_1$  Age of building

$X_2$  - Floors

$X_3$  - Nearness to facilities

$X_4$  - Parking facilities

$X_5$  - Number of rooms

$X_6$  - Total floor space

$X_7$  - View from property

Have been omitted the following variables (which resulted not statistically significant in the regression output of the model 1): nearness to facilities, total floor space, view from property. The output is as following:

Table 6.5. *Regression output with omitted variables*

Dependent Variable: SELLING\_PRICE

Method: Least Squares  
 Date: 01/05/18 Time: 12:13  
 Sample: 1 50  
 Included observations: 50

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.283982	0.439082	5.201720	0.0000
BUILDING_AGE	-5.43E-08	2.32E-08	-2.342925	0.0236
FLOORS	0.016859	0.006054	2.784836	0.0078
PARKING_FACILITIE				
S	0.119347	0.053139	2.245937	0.0297
ROOMS_NUMBER	0.866524	0.301520	2.873852	0.0062
R-squared	0.290461	Mean dependent var		1.840000
Adjusted R-squared	0.227391	S.D. dependent var		0.738448
S.E. of regression	0.649083	Akaike info criterion		2.068127
Sum squared resid	18.95888	Schwarz criterion		2.259329
Log likelihood	-46.70316	Hannan-Quinn criter.		2.140937
F-statistic	4.605366	Durbin-Watson stat		2.128827
Prob(F-statistic)	0.003342			

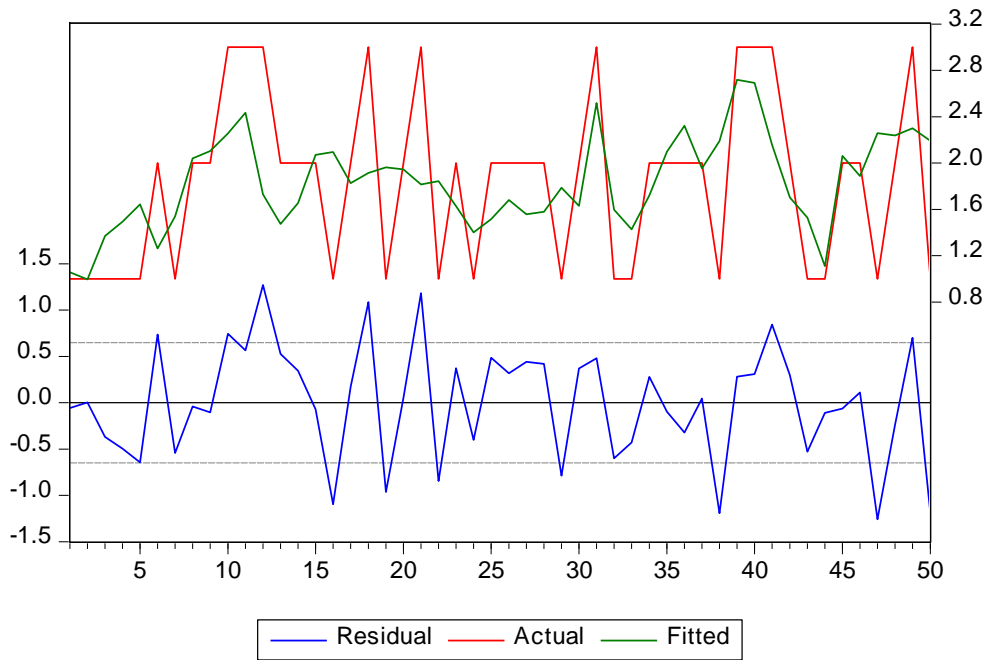
All variables are significant.

But, although all regressions coefficient are statistically relevant, compared with model 1, the statistical indicator of R has deteriorated (R=31% in Model 1 and R=29% in Model 2). This is an indicator that it is important to include more predictors in the pricing model.

## 6.4.2 Model 2: Model statistical properties

### 6.4.2.1 Goodness of fit

Goodness of fit for model two is tested through graphical representation of residual, actual and fitted data. The output is given in the below graph.

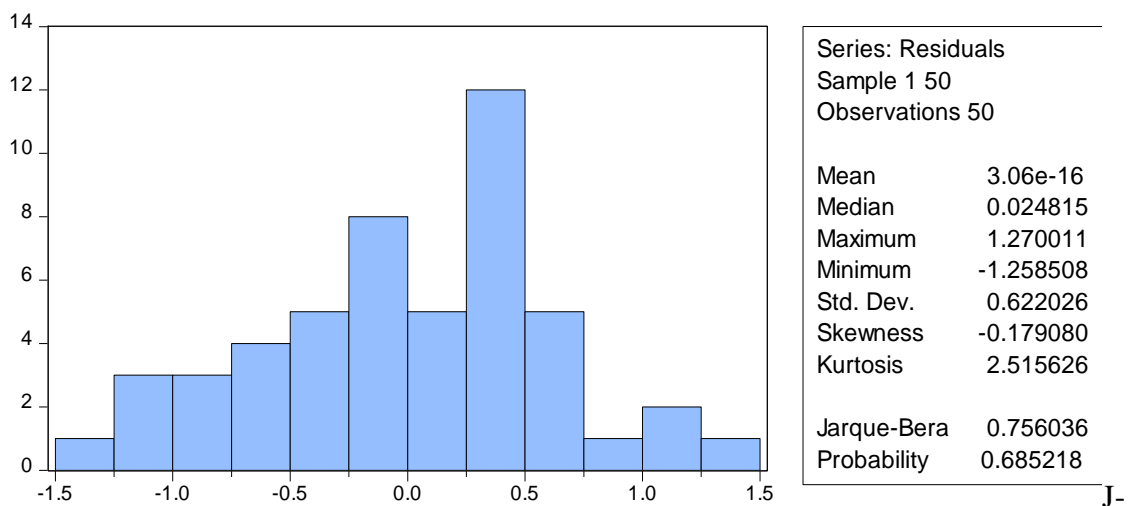


*Figure 6. 3.* Goodness of fit of the model with omitted variables

As may be evident from the graph, the difference between actual data and fitted one is relatively low, indicating for a good predictive power of the regression model (2).

#### 6.4.2.2 Normality test

Normality for model two is tested through Jacque - Bera test, and the output is given below.



B estimated coefficient = 0,75 > Critical value from the Chi distribution= 4.61 .

*Figure 6.4.* Normality test of the model with omitted variables

Given the above, the data are normally distributed.

### 6.4.2.3 Heteroscedasticity test Model 2

Heteroscedasticity for model two is tested below.

Table 6.6. *Heteroscedasticity test output with omitted variables*

Heteroskedasticity Test: White

F-statistic	1.635914	Prob. F(13,36)	00204
Obs*R-squared	18.56822	Prob. Chi-Square(13)	0.0371
Scaled explained SS	11.39770	Prob. Chi-Square(13)	0.0075

Test Equation:  
 Dependent Variable: RESID^2  
 Method: Least Squares  
 Date: 01/05/18 Time: 12:14  
 Sample: 1 50  
 Included observations: 50  
 Collinear test regressors dropped from specification

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.144562	0.819425	1.396786	0.0010
BUILDING_AGE^2	1.53E-16	3.38E-15	0.045303	0.0041
BUILDING_AGE*FLOORS	-4.20E-09	2.41E-09	-1.741357	0.0102
BUILDING_AGE*PARKING_FACILITIES	-3.43E-08	1.45E-08	-2.372297	0.0231
BUILDING_AGE*ROOMS_NUMBER	7.42E-09	7.31E-08	0.101561	0.0197
BUILDING_AGE	4.96E-07	1.77E-07	2.796617	0.0082
FLOORS^2	0.000143	0.000292	0.489670	0.0273
FLOORS*PARKING_FACILITIES	0.008650	0.003420	2.528917	0.0160
FLOORS*ROOMS_NUMBER	0.020431	0.022231	0.919045	0.0342
FLOORS	-0.040929	0.024256	-1.687371	0.002
PARKING_FACILITIES^2	0.031128	0.026441	1.177265	0.0468
PARKING_FACILITIES*ROOMS_NUMBER	-0.032583	0.157551	-0.206808	0.0373
PARKING_FACILITIES	-0.669077	0.304600	-2.196575	0.0346
ROOMS_NUMBER^2	-0.736946	0.759020	-0.970918	0.0381

R-squared	0.371364	Mean dependent var	0.379178
Adjusted R-squared	0.144357	S.D. dependent var	0.471548
S.E. of regression	0.436186	Akaike info criterion	1.410001
Sum squared resid	6.849302	Schwarz criterion	1.945367
Log likelihood	-21.25002	Hannan-Quinn criter.	1.613871
F-statistic	1.635914	Durbin-Watson stat	2.692420
Prob(F-statistic)	0.120380		

Given that the  $P < \alpha = 0.05$ ,  $H_0$  is rejected, therefore data are not heteroscedastic.

## 7. CONCLUSION

### 7.1 Findings Summary

Conclusions are organized in three groups based on the three research questions:

Firstly, Which are the most used valuation approaches used in literature?

This research concluded that the most common method used in literature for property evaluation were: (1) Market value comparison approach, (2) Income capitalization approach and (3) Cost approach (Rahman M., 2006; Lawson, 2008; Australian Property Institute Professional Practice 2000 Manual; The Appraisal Process AIREA textbook; The Appraisal of Real Estate; Lusht Appraisal Process; 1997; Pengfei, W; 2011).

While methods such as: Mass appraisal Evaluation, American School, British School and German School are rarely used (Rahman M., 2006; Żróbek,et.al.; 2014)

Secondly the question addressed in this paper, was: “Which is the mostly common and applied method of property evaluation?”. This question tried to considered

This paper showed that the most used method for property evaluation was Multi Linear Regression. Moreover, the repressors should include internal and external characters. This model are integrated in the so called: Hedonist Models.

Thirdly, in order to respond to the question: Which are the most important factors to consider when doing property valuation?”, in this paper were used data from Albanian Context.

The results are:

- From data gathered in Albanian Context, there results that apartaments have highly similar values on characteristic such as: similar Floors, Nearness to facilities, Parking facilities, Number of rooms, Total floor

- space View from property. The building age of apartments is the only variable that highly changes among different apartments. This is an indicator that the (1) only a specific category of apartments choose to go through real estate agencies to make transactions and (2) price levels in real estate market is not of a wide spectrum.
- Based on Skewness and Kurtosis values and on normality test it results that data gathered in Albanian Context for property are normally distributed. This is indicator that the Model of Linear Regression is suitable to be applied for predictive reasons in Albanian context.
- Nearness to facilities, total floor space, view from property are not statistically significant variables in predicting price level of property in Albania.
- Floors, Parking facilities, and Number of rooms, are statistically significant variables in predicting price level of property in Albania.
- The price prediction of property which includes as predictors: Floors, Parking facilities, and Number of rooms is not satisfactory in terms of R. The dispersion of these variables achieve to predict only 30% of the dispersion of price level.

## **7.2 Implications**

This study has several implications: (1) it implies that current literature should omit several methods of property evaluation and focus and deep then the analysis only on the most cited and practically used methods (Hedonist, Market value comparison approach, Income capitalization approach and Cost approach and Rental Value Assessment), (2) Albanian real estate should use hedonistic models in price determination. This study conclude that Floors, Parking facilities, and Number of rooms are important determinants in price level, but real estates should increase the number of predictor (excluding Nearness to facilities, total floor space, view from property) by testing their significance, and (3) researches in Albanian context regarding property evaluation methods are important and they should use this research as a reference for the best approach (Hedonic) and most important property price determinants.

### **7.3 Limitation of the study**

This study has several limitations, mainly in the database composition. Firstly the sample is limited. Secondly data are not gathered for a wide spectrum of geographic locations, but are centralized only in Tirana. It has not been possible to get data for *qualitative* variables, because Real estate agencies did not had them in their databases, such as: Type of property, Nature of Construction, Condition of building, etc.

### **7.4 Further studies**

Based on this paper results and limitations there are several suggestions to be made to further studies: (1) it is important to increase the number of predictors of price level of property in Multi linear regression, (2) it is a must to explore the methodologies that real estate agencies use in Albania (not only Tirana) in order to give them suggestions base d on best literature recommendations and conclusions, (3) it is imperative to address the problems of error in statistical methodologies for property evaluations (although that this study proved that data of property in Albania does not suffer from heteroscedasticity or distribution problems).



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## APPENDIX

### Appendix 1: Research Database

<b>Selling Price</b>	<b>Total floor space</b>	<b>Number of rooms</b>	<b>Age of building</b>	<b>Floors</b>	<b>View from property</b>	<b>Parking facilities</b>	<b>Nearness to facilities</b>
10730000	100	5	5	2	A	C	C
7225000	85	5	5	2	A	B	A
18473600	92	5	5	1	A	C	A
13347000	90	5	6	1	A	B	A
9657000	87	5	6	1	A	A	A
7056000	56	4	6	1	B	A	C
6272000	70	3	6	1	A	A	C
5880000	70	3	2	1	B	B	C
4690000	70	3	2	1	B	B	B
6545000	85	3	2	1	C	C	B
6365000	95	5	2	1	C	C	A
19361000	95	4	2	1	C	A	B
10643400	73	4	5	1	B	B	B
9784800	81	3	5	1	B	B	A
7786000	85	4	3	1	B	A	A
5760000	80	5	3	1	A	C	C
10704000	80	5	3	1	B	C	C
9104000	80	5	3	1	C	C	A
5152000	56	4	1	1	A	A	B
3600000	50	3	1	1	B	A	A
5980000	50	3	1	1	C	B	B
5480000	50	3	1	1	A	B	C
5304000	65	4	5	1	B	A	C

9490000	65	4	5	1	A	B	A
7397000	65	4	5	1	B	C	B
5880000	70	5	5	1	B	A	A
11910000	75	5	4	1	B	A	B
11497500	75	5	4	1	B	B	A
9264000	80	5	4	1	A	C	A
7728000	80	5	6	1	B	A	C
7614000	104	6	2	1	C	B	C
11695700	121	4	3	2	A	C	C
8308750	100	4	3	2	A	A	C
21059904	107	4	3	1	B	C	B
14414760	115	4	4	1	B	B	A
11202120	118	4	4	1	B	A	A
9878400	92	5	4	1	B	B	B
8028160	100	2	4	1	A	B	C
7702800	109	2	1	1	C	B	C
6003200	102	2	1	1	C	B	A
7657650	127	2	1	2	C	A	B
10438600	109	4	1	2	B	C	A
29622330	109	3	1	1	A	A	B
18519516	114	3	3	2	A	C	B
15264288	160	2	3	2	B	B	A
13547640	130	3	1	2	B	A	C
10886400	92	4	1	1	A	A	C
11239200	92	5	1	1	B	C	A
10105440	92	5	1	1	C	B	B
5615680	64	3	-1	1	A	A	B

## Appendix 2: Most used property evaluation approaches in literature

Approach	(Rahman M. , 2006)	(Lawson, 2008)	Australian Property Institute Professional Practice 2000 Manual	The Appraisal Process AIREA textbook The Appraisal of Real Estate	Lusht Appraisal Process (1997)	Žróbek,et.al. (2014)	Pengfei, W. (2011)
Market value comparison approach	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>		<b>X</b>
Income capitalization approach	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>		<b>X</b>
Cost approach, Rental Value Assessment	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>		<b>X</b>
Mass appraisal Evaluation	<b>X</b>						
American School						<b>X</b>	
British School						<b>X</b>	
German School.						<b>X</b>	