Towards a Real Estate Monitoring Information System in Romania

Paul de Vries
Robbert Faber

This paper examines the construction of real estate databases and the valuation of properties in Buzău, Romania. One of the criteria for candidate states for EU membership is an effective monitoring system for the land and real estate markets. The objective of this paper is twofold. First, the development of a set of databases, procedures and guidelines that enables a valuation process on the Romanian real estate market and secondly, using those databases, to gain insight into the real market value of recently sold properties. We use the observations of estate agents and banks starting in May 2007. Using hedonic regression, with house and neighbourhood characteristics, we estimate the house prices.

Key words :
JEL classification :

1. Introduction

Since 1 January 2007, Romania has been a member of the European Union. In its final monitoring report on 26 September 2006, the European Commission gave the green light to Romanian accession in 2007, but insisted on further reforms. For further reforms the Commission or member states were willing to assist Romania in the form of advisory or projects. One of the European Union projects involved supporting the monitoring of the land and real estate markets and a valuation process in Romania.

The Dutch Agency for International Business and Cooperation (EVD) identified a project in Romania titled Support for Monitoring the Real Estate Market. The administrative counterpart for the project is the Romanian Ministry of Interior and Administrative Reform, while the beneficiary is the National Agency of Cadastre and Land Registration (NACLR) or, in Romanian, *Agenţia Naţională de Cadastru şi Publicitate Imobiliară* (ANCPI). The project is being implemented through Kadaster International, the international consulting department of Kadaster, which is the national Cadastre, Land Registry and Mapping Agency of the Netherlands. The purpose of the project is, as the name already indicates, to support the monitoring of the land and real estate markets and create the means for a valuation process in Romania. By law, the NACLR must provide a well-functioning cadastral system, including a set of databases, procedures and guidelines that enables a valuation process on the Romanian real estate market. For this purpose a software has been developed called REMIS (Real Estate Monitoring Information System).

This article will report on the pilot project that has been conducted prior to implementation across the whole of Romania. This means that, in a pilot situation, those items are recorded which make it possible to understand the real market value of recently sold properties and, using these data, to estimate the values of other properties in the pilot area. The pilot area is the territory of the municipality of Buzău, a city located 100 kilometres northeast of Bucharest with around 135,000 inhabitants and around 55,000 properties on a land area of 80 km^2. The participants or stakeholders in this pilot are the NACLR (Romanian cadastre), the public notaries, the local branches of two banks, Transilvania Bank and Raiffeissen Bank, a real estate agent and the municipality of Buzău which regulates the use of land in its territory and collects property taxes. These entities play a major role in the input and output requirements for the REMIS module.

In addition to the construction of the database, another aim of the project is to gain insight into the real market value of recently sold

properties and the valuation of all (including the not sold) properties. A house price model for the pilot region of Buzău is built using the REMIS-database. Actually, this is the main point of the article.

Romania is an Eastern European Country (EEC) in transition. This means e.g. a huge lag of information about the quality of the individual properties, including the property rights. After 1990 many private properties rights were re-instated to their pre-1940 situation. These new registrations require a well-functioning cadastral system. However, the system is just in an early stage.

The paper contains six sections. Section 2 gives some brief background information about Romania and other Eastern European Countries (EEC). Particular attention is given to the standard of housing and the impact of the privatisation of the housing stock during the transition from socialism to capitalism. Section 3 examines cadastral systems as a method of measuring house prices broadly. For the Romanian case, section 4 presents the REMIS-database more deeply. Section 5 presents the house price model and the results. Despite of the lag of data quality, we can conclude that the REMIS-data includes information which can be used for mass valuation, in other words that it is an effective monitoring system for the land and real estate markets. Section 6 concludes.

2. Romania – a housing market in transition

Privatisation in general

Romania was the last Eastern Europe Country (EEC) to leave the post-war era behind and begin to implement reform programmes in the 1990s. During the transition to capitalism in Romania, private property rights were re-instated to pre-1940s levels. E.g., by 2005 almost 95% of land belonged to individual farmers, compared to only 9% in 1990 at the start of transition (Vidican, 2009).

Before this transition, public housing had been the dominant form in the South Eastern Europe region, especially in the major urban areas. In fact, unlike most other EEC, Romania was not highly urbanized (Palacin and Shelburne 2005), meaning that the percentage of private ownership was higher than in other countries (around 70%). With the transition to a market economy, it was natural that the housing stock in urban areas would be transferred to private ownership.

Privatisation was accompanied by a series of reforms aimed at creating institutions for housing markets and often by encouraging homeownership. Particularly in the Romanian case, privatisation began as early as 1990 by resituating agricultural land and privatising the state-owned housing stock (through a series of legal acts). The private sector grew steadily over the years as a result of mass privatisation, the sale of state assets to the State-ownership Funds and through various other methods (Budisteanu and Coman 2000). Until 2003, the state determined more or less the house price based on mostly the region and the usable floor space. After 2003, the state was not longer involved in the house price mechanism, however the usable floor space is still used for property taxes. Nowadays, more than 95% of the housing stock is private property.

These property reforms in the EEC have had significant effects on both income distribution and efficiency. In general, privatisation has improved economic efficiency (Swinnen 1999). Empirical evidence suggests that secure and unrestricted private property rights to land and other productive assets are essential to ensure the most efficient agricultural production (Csaki and Lerman, 1995). The benefits of recording ownership in a public cadastral system also apply to housing property rights. We see that privatisation influences income and wealth distribution. Analyses of other land reforms (e.g., de Janvry, 1981; Allen, 1982; Hayami, 1991) and of institutional change in general (Bardhan, 1989) emphasise the prime importance of the implications of distribution.

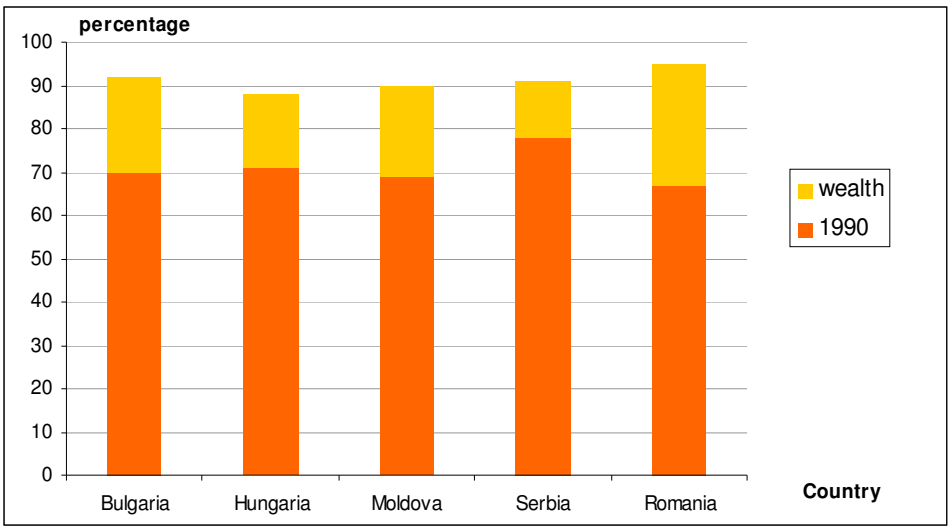
Housing stock

As a result of the privatisation of the housing sectors in the EEC, the region as a whole moved closer to a market system, with the elimination of subsidies for utilities, the emergence of private finance and land markets (Yemtsov 2007). During 1991-99, as much as 28 per cent of the EEC housing stock was privatised, generally by simple give-away schemes (most frequently by selling housing units at prices well below market valuations). Figure 1 presents World Bank data on the change in the rate of private ownership. The figure shows the share of housing in private hands (measured in square meters of living space) at the start of the transition and by 1999. The scale of the transfer of ownership is impressive, representing a median value of one third of the housing stock. In Romania, as in most of the EEC, homeownership exceeds 95%, which is higher than the 60% average in many West European countries. The growing rate of homeownership is having a positive effect on levels of personal wealth – after all, housing represents the largest part of household wealth. An analysis of the balance sheets of a number of rich countries shows that housing accounts for an average of 35 to 45 per cent of total household wealth. In Romania housing accounts for similarly large share (see Davies and Shorrocks 2005).

Following Tsenkova (2009), Romania currently has over eight million housing units, representing one of the largest housing stocks in EEC (Table 1). All the countries with the exception of Kosovo have a surplus of housing in relation to the number of households. However, there are significant differences in the magnitude of the general housing surplus ranging from 786,000 units in Romania to 58,000 in Albania. In terms of housing surplus as a share of the total stock, most countries are in the range of above the 15%, with Romania (10%) having a lower than average surplus.

Figure 1

The outcome of privatisation by 1999: share of housing (living space in m2) in private hands



Source: World Bank (2001).

Table 1

Household and housing indicators

		number of Households	Household size	House units	Housing surplus	
		X 1,000	persons	X 1,000	X 1,000	percentage
Romania	2002	7320	2,9	8107	787	10%
Albania	2001	727	4,2	786	59	8%

Bulgaria	2001	2922	2,7	3686	764	21%
Croatia	1991	1544	3,1	1852	308	17%
Kosovo	2003	370	5,6	300	-70	-23%
Moldova	2002	982	-	1291	309	24%
Macedonia	2002	564	3,6	698	134	19%
Serbia	2002	2521	2,9	2957	436	15%
Montenegro	2002	192	3,2	253	61	24%

Source: Tsenkova (2005)

Housing quality

It is difficult to find both reliable data and good measures for the quantitative aspects of the housing situation in the EEC. Table 2 provides a series of indices of the availability of dwellings and their size at the national/urban level. Contrary to expectations, urban areas seem to have very similar indicators, suggesting minor inequalities in housing consumption. Dwellings tend to be small with an average of 2.7 rooms; Romania stands out with 37 m^2 of average useful floor space per person (Tsenkova, 2009). Romanian census data also indicates that dwellings on average tend to be small and to accommodate more than one household or that the ratio of persons per room is higher than 1. There are many cases of more than three occupants per room.

Despite the limitations, the information that is available regarding housing quality suggests that an improvement has taken place over recent decades (Tsenkova, 2009). In fact, this improvement has not occurred through public investment but mainly through self-help and private investment. There are also significant differences between urban and rural areas; for example, almost all households in the large towns have a mains water supply, while two-thirds of the dwellings in rural Romania lack modern water and sewage facilities.

Another characteristic of housing quality is the widespread existence of multi-family panel apartment blocks. In Romania, multi-family panel apartment blocks account for 72% the urban housing stock. (Hegedüs and Teller, 2003). Also, in relation to the rest of the region, the Romanian housing stock is smaller (per head of the population) and of below average quality (table 2). The quality and quantity back-logs in the sector mean that large amounts of investment would be necessary to improve the housing conditions. Housing quality is closely related to improved access to safe drinking water and sewage facilities, particularly in rural communities.

Housing represents a vast potential source of economic growth for the EEC. Despite the overall surplus of housing across the region, the mismatch between household structure and the existing housing stock is significant, particularly in Romania (Tsenkova 2009).

Table 2

Household and housing indicators

	Year	Dwelling per 1,000 inhabitants	Floor area m2		Number of rooms	
		urban	national	urban	national	urban
Romania	2002	373	37,4	37,4	2,6	2,4
Albania	2001	278	67,0	69,0	2,2	2,1
Bulgaria	2001	420	63,3	63,9	2,8	2,6
Macedonia	2002	-	71,2	-	3	-
Moldova	2003	353	59,1	53,8	2,7	2,3

Serbia	2002	367	66,9	63,1	2,7	2,4

Source: Tsenkova (2005)

House prices

Although house prices in the EEC remain, on average, far below Western European levels, they have been catching up rapidly, with sustained real annual increases in the double-digit range not uncommon. Égert and Mihaljek (2007) were the first researchers to establish a relationship between house prices and other fundamental factors such as income and real interest rates for the region. It is important to note that despite the highly unusual context of economic transition, they found a significant correlation between real interest rates and house prices, as well as between housing credit and house prices in both Eastern European Countries and OECD countries. House prices in Eastern Europe have tended to increase twice as fast as house prices in OECD countries, while there has been an equivalent drop in real interest rates. On the other hand, house prices in OECD countries seem to respond roughly twice as much to credit growth compared to EEC economies. The rapid credit growth observed in Eastern Europe may therefore have a smaller impact on the growth of house prices than is usually assumed on the basis of the relationships obtained in the OECD countries.

An important point to note is that Égert and Mihaljek (2007) argue that house prices are probably undervaluation. This is because price development partly reflects a correction of the initial underestimate of house prices, and also that they were highly distorted relative to the prices of other consumer durables at the start of the transition. They also argue that the overvaluation can never be very great because they demonstrate a significant statistical relationship between house prices and its fundamentals.

3. Cadastral systems

The need for cadastral systems

The transition from command to market-driven economies in Eastern and Central Europe has resulted in an urgent need in those countries for cadastral and land information systems to encourage effective land markets, which in turn support economic development (Williamson 1997). In a market economy, property is a commodity which can be bought and sold. It is the principal source of a nation's wealth, accounting for between half and three-quarters of a nation's total wealth. The development of a property market is therefore vital for promoting investments in the economy. These demands have raised awareness of the importance of cadastral and land information systems worldwide.

Williamson (1997) also sets out a number of requirements for the design of cadastral systems. They must be appropriate, systematic, sustainable and sensitive to the culture, needs, resources and level of development of individual countries. They should be designed according to the needs of land holders, and not the needs of central government bureaucracy. Cadastral systems must be kept up-to-date, otherwise there is little justification for their existence. According to Williamson, the most important characteristics of cadastral systems in developing countries include guaranteeing security of tenure, improving access to land, promoting economic and sustainable development, reducing poverty and supporting national development in the broadest sense.

Well functioning Cadastral systems enable properties to be valued using mass valuation. To do this, the system needs to record the appropriate features of the dwelling, such as neighbourhood, surface area, the characteristics of the dwelling and, of course, the price. This valuation information is needed by mortgage lenders, tax authorities and insurance companies.

4. REMIS

Purpose

One of the European projects undertaken when Romania acceded to the European Union was the establishment of a cadastral system including a monitoring function for the real estate market in Romania called REMIS (*Real Estate Market Information System*). The Dutch Agency for International Business and Cooperation (EVD) identified this project, titled *Support for Monitoring of the Real Estate Market in Romania*F′F. The administrative counterpart of the project is the Romanian Ministry of Administration and Interior while the beneficiary is the National Agency of Cadastre and Land Registration (NACLR) or, in Romanian, *Agenţia Naţională de Cadastru şi Publicitate Imobiliară* (ANCPI). The project was implemented by Kadaster International, the international consulting department of Kadaster, which is the national Cadastre, Land Registry and Mapping Agency of the Netherlands.

The purpose of REMIS is to support the monitoring of land and real estate markets and the valuation process in Romania. REMIS provides the basis for the adoption of a tax system for real estate in Romania that is transparent and based on accurate market values. Remark that monitoring the real estate market and sharing that market information is a complete new phenomenon for Romania. The basic structure of the REMIS system is represented in Figure 2.

Data collection and standardization

Because the NACLR does not have all the characteristics of the real estate necessary for mass valuation or has currently no means to verify the correctness of the provided data, forces have been joined as shown in the figure. In the pilot area of Buzău cooperation from the municipality, two banks and an estate agents was received. The municipality provided the REMIS project with a complete database of all their taxable properties, detailed up to the level of house number or

[1] The project started in April 2007. To inform on the results of the pilot project a final seminar was held in Bucharest on May 14, 2009. Representatives of all involved presented their part and experience in this quite unique cooperation between different parties.

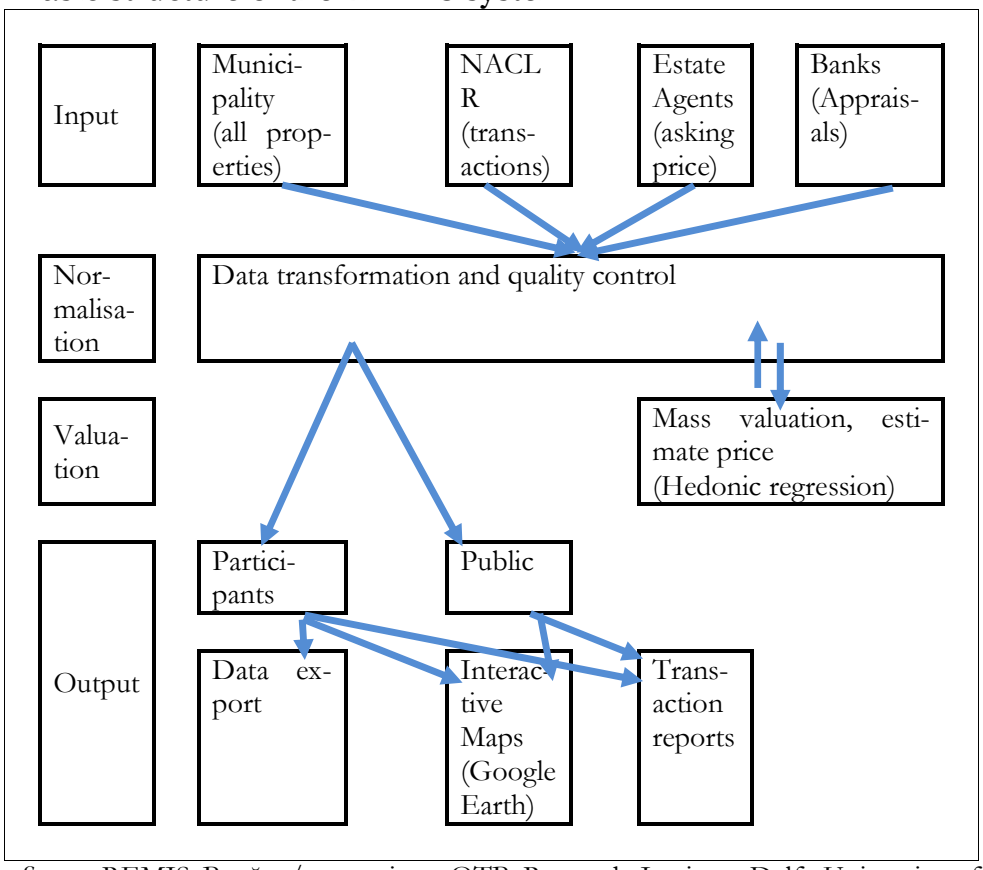
with apartments which in Buzău do no have a house number, the block number, entrance, floor and apartment number. Two banks provided data on properties (property characteristics and the appraisal values) for which they accepted a mortgage. One provided these data on detailed level while the other bank provided only aggregated data. The reason for providing aggregated data was because they feared to violate bank secrecy and privacy legislation. The estate agents provided the asking price and property characteristics, however, in many cases even the street name is not know and only the name of the neighbourhood is given.

It was anticipated that data quality, in the sense that different sources could be compared and combined, would be the major bottleneck in this project. For exchange of market information and to gain insight into the real market value of recently sold properties the characteristics of the individual objects in the database must be up to standards. In May 2008, half way the project, the general remark was: "In lieu of a complete outline, we will make only these notes: generally speaking, all the variables are incomplete. At this time, a good and accurate valuation formula cannot be estimated" (Vries, 2008). Between May 2008 and December 2008, the REMIS partners were continuing to improve the quality of the database, which are necessary in order to provide a more accurate valuation of the individual object in the database. For Instance, clearly definitions for each characteristic were formulated and software tools were developed detecting illogical values in the system. Using the export function, the data is made available in a standardised form. There is scope for many characteristics within the REMIS database. In fact, only eleven characteristics are available in all the subsidiary databases. These are neighbourhood, street name, house number, floor, number of rooms, house type, adjoining land, year of construction, usable floor area of main building or the property itself, house price and transaction data. Data view is also possible with Google Earth.

Finally, the REMIS database covers all the databases and includes 1,053 properties on the market.

Figure 2

Basic structure of the REMIS system



Source: REMIS Buzău / operations OTB Research Institute Delft University of Technology

5. Valuation House Prices

Hedonic price modelling

To value the individual objects in the REMIS database, hedonic regression analysis will be used. Hedonic regression is a very common method and is based on the principle that the price of a house can be accurately estimated on the basis of its characteristics, such as the number of rooms, plot size and neighbourhood (location). The hedonic coefficients can be interpreted as shadow prices that reflect the value of a characteristic; for example, an extra room will raise the value of the property by a specific amount.

However, the challenge posed by this method is to compute a functionally correct mathematical model. A correct set of explanatory variables must be specified and the relationships between these and the response variable (the house price) must be correctly determined beforehand. Specifying the correct functional form and including the correct set of quality characteristics is an essential element of hedonic modelling. Mason and Quigley (1996) argue that the functional form assumption is particularly awkward in the housing context because the hedonic price function summarises not only consumer preferences and production technologies but also various quantities which are historically determined, hard to measure, and inaccessible to economic theory (see also Vries and Boelhouwer, 2005). Evidence is frequently found that the number of rooms, the type of dwelling, quality of the neighbourhood or environment, region and time of sale, all have an impact on the house price. The degree of influence of each will differ for each country.

House Price model for Buzău

The REMIS project bases its mass-valuation on housing characteristics. One problem is the difficulty for finding both reliable data and reliable measures for the quantitative aspects of the housing situation in EEC (Tsenkova 2009), and that housing improvements do not on the whole come about through public investment, but rather tend to be carried out under individual initiative. This means that it is more

difficult to establish the relationship between housing quality and price. Another problem is that the housing stock in Romania consists mainly of uniform multi-apartment blocks. Finally, it is also suggested that housing prices were too low at first, and that they are now too high (Égert and Mihaljek 2007), which means that the relationship between price and quality is distorted. On other problem to be solved was that for the pilot the price and the quality characteristics were collected from May 2005 until December 2008. Because of the time difference, these house prices were made real by correcting them using the CPI. So, the house price is analysed in real eurosF[1]F (euros 2005).

In May 2008, all the properties in Buzău were valued for the first time using a trial version of the REMIS database. This first mass valuation leads to a series of requirements for the REMIS database. In lieu of a complete outline all the variables are incomplete. At that time, a good and accurate valuation formula could not be estimated" (Vries 2008). Since May 2008 until May 2009, the REMIS partners have continued to improve the quality of the database, which is necessary in order to produce a more accurate valuation of the individual objects in the database. A great deal of work was done, particularly on checking the databases, adding uniform street names, neighbourhood names and dwelling types. Unfortunately, this effort has not yet resulted in enough useful properties with valid property characteristics in the REMIS databases for a reliable valuation of unsold properties. Perhaps the goals were too ambitious, especially considering other researchers had had serious problems regarding the quality of data on house prices and their determinants (Égert and Mihaljek 2007; Tsenkova 2009). Using the database that has been built up so far (May 2009), it is possible to determine what can be achieved in the future.

Despite the lack of an accurate set of quality characteristics, which is an essential element of hedonic modelling, the model has been as-

[1] If REMIS only records the price in RON, this is converted into euro. The conversion of the Romanian Lei (RON) into euros is performed using the daily exchange rate.

sessed with the aim of discovering what capabilities the REMIS database will have when the quality of the data improves. To achieve this, a number of corrections will be necessary.

Firstly, we decide to ignore for the analyses all the house characteristics of which 20% or less is unknown. Secondly, before any analyses are performed, a very rough correction is made to select for prices in the range of R55,000 and R3,500,000 (€14,758 and €939,144). This is an arbitrary correction; other price ranges could also have been used. Lastly, we reduce the number of quality characteristics. REMIS includes a large number of quality characteristics which describe broadly the same quality in the dwelling, for example, the neighbourhood characteristics (e.g. street, house number, block, apartment number, region), size (floor space, building space, land space) or the price itself (in euro, in Romanian Lei (RON) and an estimate in euro from RON). Through these corrective measures, the number of quality characteristics is reduced from 43 to 12 and the number of properties from 1053 to 868 (March 2009). In appendix A the distribution and mean price of all these quality characteristics are recorded.

Although a number of improvements have yet to be implemented, we were able to estimate house prices in Buzău using hedonic regression. These are the first preliminary results of the valuation which show us what can be achieved with the REMIS database. The house price model is summarised in Table 3. The models include variables for the source, house type, neighbourhood, floor space, number of rooms and building year. As explained earlier, the hedonic coefficients can be interpreted as prices of the characteristic. To give two examples of this: the value of three rooms is €11,910 more than one or two rooms in a house. Regarding the neighbourhood, the value of a house in Crang or Dorobanti is €17,867 less than the same object in Nicolae Balcescu, according to the equation (see table 3).

The model is not a strong model. That is reflected both in the low coefficient of determination (R^2) and the large number of non-

significant regression coefficients. The R^2 indicates the strength of the relationship in the formula. Normally hedonic models for house prices reach correlation coefficients around 0.60 ~ 0.70; in our pilot model the R^2 is only 0.20. With respect to the number of significant quality characteristics, only 6 of 15 characteristics are significant. A regression coefficient becomes significant at values under 0.10; if the significance is greater than that, the quality characteristic has virtually no influence on the value of the dwelling. For example, in Table 3, the effect of the year of construction is taken into account, but not all the hedonic coefficients are significant. This would suggest that the year of construction has no influence on the value of the dwelling. However, to give an indication of the usefulness of REMIS, we have recorded also the non significant quality characteristics.

However, despite the poor model, we can see that it produces results that reflect reality reasonably accurately. Figures 3, 4 and 5 compare the estimated house prices to the actual prices. Figure 3 shows the price development of all the dwellings sold in Buzau from 2005 onwards. For many months, the house prices measured in reality were within the estimated 95% reliability range. Figure 5 shows the results for dwelling type and lastly figure 6 for neighbourhoods.

Table 3

Hedonic formula for valuation in Buzău (R^2 = 0,20)

Estimate: real house price (in euro, 2005)

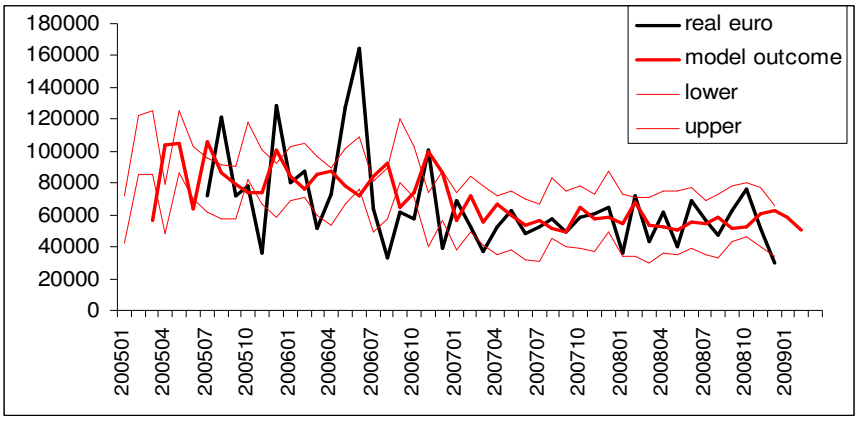
	Coefficient	Sig
(Constant)	10512	0.38
Source		
Agenti	0	-
de la banci and din ofert	26124	0.00
House Type		

no apartment	75736	0.00
Neighbourhood		
Nicolae Balcescu	0	-
Orizont, Simileasca, Unirii	-29702	0.08
Crang, Dorobanti	-17867	0.25
Constitutiei, Marghiloman, Mihai Viteazu	-7265	0.50
Democratiei, Episcopiei, Independentei, Zona Centrala	4011	0.70
Brosteni, Nicolae Titulescu, Obor, Posta	27129	0.03
Floor space		
Floor m^2 0 - 50 m^2	0	-
Floor m^2 50 - 100 m^2	600	0.92
Floor m^2 100 - 200 m^2	15039	0.20
Floor m^2 200 m^2 and more	27153	0.00
Rooms		
1-2 room	0	-
3 rooms	11910	0.05
4 or more rooms	26622	0.00
Year of construction		
before 1975	0	-
1976 – 1980	2592	0.73
1980 - thru 2008	5270	0.40

Source: REMIS Buzău / operations OTB Research Institute Delft University of Technology

Figure 3

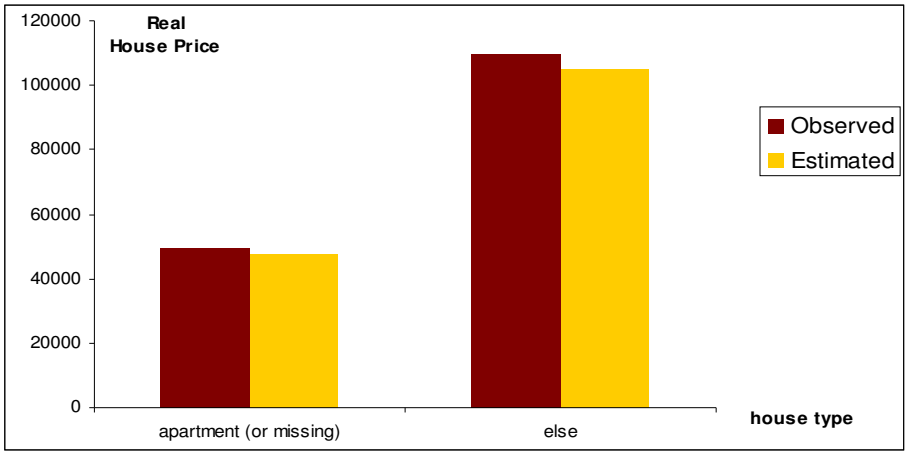
House Price (euro's 2005) all properties in Buzău, actual and estimated



Source: REMIS Buzău / operations OTB Research Institute Delft University of Technology

Figure 4

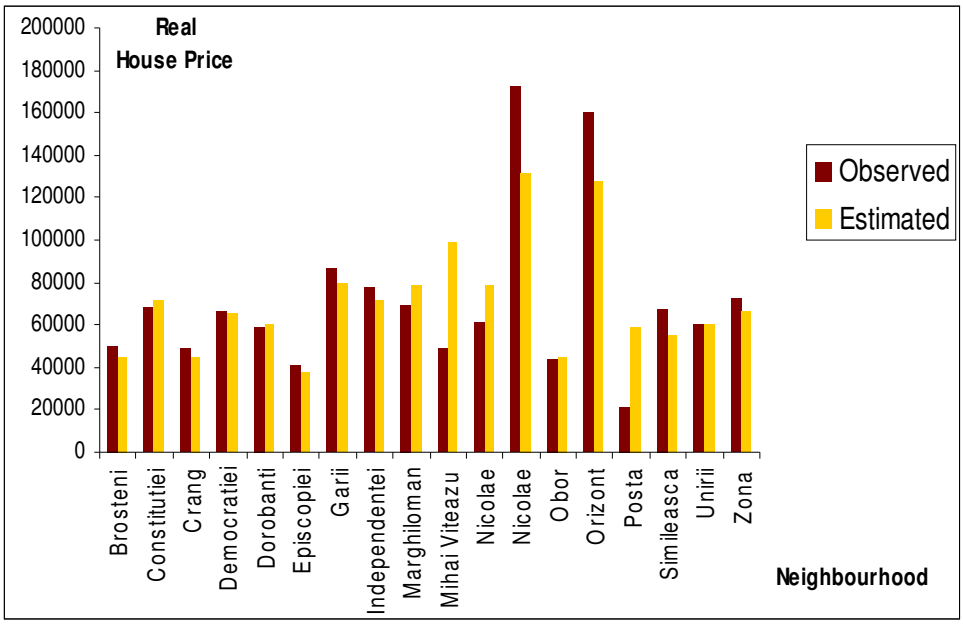
House Price (euro's 2005) by dwelling type in Buzău, actual and estimated



Source: REMIS Buzău / operations OTB Research Institute Delft University of Technology

Figure 5

House Price (euro's 2005) by neighbourhood in Buzău, actual and estimated



Source: REMIS Buzău / operations OTB Research Institute Delft University of Technology

6. Future

One of the criteria for candidate states for EU membership is an effective monitoring system for the land and real estate markets. However, the construction of real estate databases in Eastern Europe Countries is still in its infancy. As far as we know, REMIS (*Real Estate Monitoring Information System*) is one of the first projects in the region for exchange market information between stakeholders including the valuation of properties.

Between May 2007 and May 2009 a pilot project in Buzău, Romania explore the possibilities for a Real Estate Monitoring Information System (REMIS). In addition to the construction of the database another aim of the project is to gain insight into the real market value of recently sold properties. That means a statistic method (including use of the REMIS database) to estimate values of other (not sold) properties in Buzău. However, in using a method for the valuation of individual objects the database must be up to standards. Despite the continuous improvements, the quality of the database is not as good as necessary in order to provide an accurate valuation of the individual objects in the database. However, the preliminary results show the possibilities of the REMIS database for the real estate market in Romania. Moreover, the need of this type of information was stressed by all parties involved –including the central government of RomaniaF[1]F.

After all, if the mass valuation of all properties in Buzău using hedonic price modelling produces reliable and recognisable valuations, then the NACLR can also be used to value unsold properties and the project can be judged a success. We can then conclude that the pilot meets the

[1] The Minister of State, Radu Stancu, mentions in his opening speech of the final seminar on May 14th 2009 the need for implementing REMIS countrywide.

criteria for candidate states for EU membership, in other words that it is an effective monitoring system for the land and real estate markets.

A: Data Appendix

Table A1

Numbers and prices (euro's 2005) in the REMIS database

	Properties		House Price (euro's 2005)		
	numbers	percentage	observed	estimated	difference
Data source					
de la agentie	235	32%	41420	44289	-2869
de la banci	429	48%	73297	74305	-1008
din oferte	204	20%	68015	65914	2102
House type					
apartment (or missing)	666	73%	49363	47626	1737
no apartment	202	27%	109791	104792	4999
Neightbourhoods					
Nicolae Balcescu	5	2%	49098	99468	-50370
Orizont,Simileasca,Unirii	30	5%	59900	54945	4955
Crang,Dorobanti	38	4%	67325	68809	-1484
Constitutiei,Marghiloman,Mihai Viteazu, Garii	278	34%	58644	57372	1272

Democratiei,Episcopiei,Independentei,Zona Centrala	387	46%	59107	58523	584
Brosteni,Nicolae Titulescu,Obor,Posta	80	9%	95520	98068	-2548
floorm2					
- 50 m2	375	47%	56539	54061	2478
50 - 100 m2	247	26%	47064	49360	-2296
100 - 200 m2	50	5%	98436	99261	-824
200 and more m2	196	22%	88289	89502	-1213
number of rooms					
1 or 2 rooms	534	66%	60402	59646	756
3 rooms	246	25%	58602	59740	-1138
4 or more rooms	88	9%	95258	97432	-2174
Year of construction					
thru 1975	309	38%	76461	74114	2348
thru 1980	179	22%	47147	45415	1732

thru 2008	380	40%	60493	61687	-1194
Number of the floor					
ground floor	27	4%	31048	27003	4045
floor 1 or 2	354	43%	85568	84494	1074
floor 3, 4 or 5	310	34%	49805	48353	1452
floor 6 or higher	177	20%	47933	47989	-55
Landm2					
0 m2	670	78%	61795	61028	767
1 - 250 m2	11	1%	73298	69470	3828
250 - 1000 m2	46	6%	49854	64943	-15088
1000 - 1500 m2	76	9%	78132	67152	10980
1500 and more m2	65	7%	70968	76616	-5648
Transction year					
2005	79	12%	88330	83802	4528

2006	116	12%	86279	81614	4665
2007	369	41%	55670	57739	-2069
2008	304	35%	57647	55721	1926
Total					
Total Buzău	868	100%	63426	62935	490

Source: REMIS Buzău / operations OTB Research Institute Delft University of Technology

References

Allen, R. (1982), 'The Efficiency and Distributional Consequences of Eighteenth Century Enclosures', Economic Journal, 92, pp. 937–53.

Budisteanu, Ileana & Teodora Coman (2000) The transition of the housing system in Romania, An overview of the development of the housing sector, Workshop on Housing Finance Timisoara, Romania 30 January – 1 February 2000

Csaki, C. and Z. Lerman (1995), 'Agricultural Transformation in Central and Eastern Europe and the Former Soviet Union: Issues of Land Reform and Farm Restructuring', World Bank, Washington DC, unpublished draft.

Davies, J., and A. Shorrocks (2005). 'Wealth Holdings in Developing and Transition Countries', paper prepared for the LWS conference on Construction and Usage of Comparable Microdata on Wealth, 27-29 January, Perugia.

Égert, Balázs & Mihaljek, Dubravko (2007) Determinants of House Prices in Central and Eastern Europe, William Davidson Institute Working Paper Number 894

Hayami, Y. (1991), 'Land Reform', In: Meier, G. (ed.), Politics and Policymaking in Developing Countries. Perspectives on the New Political Economy, ICS Press: San Francisco, pp. 155–71.

Janvry, A. de (1981), 'The Role of Land Reform in Economic Development: Policies and Politics', American Journal of Agricultural Economics, May, pp. 384–92

Palacin, Jose; Robert C. Shelburne (2005) The private housing market in Eastern Europe and the CIS

Tsenkova, S (2009), Housing Policy Reforms in Post Socialist Europe, Contributions to Economics. DOI: 10.1007/978-3-7908-2115-4_6, Physica-Verlag Heidelberg

Vidican, Georgeta (2009) Assessing land real location decisions during transition in Romania, Land Use Policy 26 (2009) 1080–1089

Vries, P de (2008) How much is Buzău of Delft University of Technology

Williamson, Ian (1997) The justification of cadastral systems in developing countries, Geomatica, Vol 51, No1 21-36,1997

Yemtsov, Ruslan (2007) Housing Privatisation and Household Wealth in Transition, United Nations University, Research Paper No. 2007/02

Paul de VRIES, Senior researcher, Delft University of Technology, OTB Research Institute for the Built Environment, Research Group House Price and Housing Supply, The Netherlands. Publications (selection):

- "A house price index based on the SPAR method" (co-author), in R Buttimer & K Patel (Eds.), *Cambridge-UNC Symposium risk management & property valua at risk* (pp. 308-329), 2007, Cascais, Portugal: Imométrica.
- "Developing the house price index in the Netherlands: a practical application of weighted repeat sales", in J Lunde (Ed.), *Housing Economics Workshop, European Network for Housing Research (ENHR)* (pp. 1-24), 2006, Copenhagen, Denmark: Copenhagen Business School.

Robbert FABER, Cadastre, Land Registry and Mapping Agency, Kadaster International.