

ASSESSMENT OF THE IMPROVED CADASTRAL ASSESSMENT MODELS IN LATVIA

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Abstract

Previous studies it resulted in an improved cadastral assessment models of building land and rural land. This study objective was to evaluate the improved cadastral valuation models of building land and rural land by using a SWOT analysis and factorial analysis. SWOT analysis shown in network graphs, providing each of the selected factor impact assessment of an improved cadastral assessment models. After the SWOT analysis can be concluded that improved cadastral assessment models have many advantages and strengths, which creates favorable conditions for their high-quality objectivity application of the acquisition of the cadastral value. Improved cadastral assessment models the influence of importance the analysis, carried out a factor analysis of the ranking, based on expert assessment which was included in the composition of two experienced high-level practicing professionals and one scientist. Based on the obtained results of factor analysis, can conclude that the cadastral assessment process the use by improved cadastral assessment models of building land and rural land can obtain more objective cadastral value.

Keywords: assessment, value, improved cadastral assessment models, building land, rural land.

1. INTRODUCTION

Cadastral assessment is a systematic assessment of property groups on a particular date, performing the assessment according to a standardized procedure. Cadastral assessment in Latvia is mainly used for calculating the real property tax. In Europe and in other market economy countries large-scale or cadastral assessment is based on the information of real property market.

The process and methods of determining cadastral values are similar to individual assessment, but it has to be taken into consideration that during cadastral assessment a big number of objects has to be assessed at the same time and assessment costs should be low. For the cadastral assessment to be implemented, the country should have accumulated stored computerized information about objects and their characteristics, the information about real property market deals should be summarized, the assessment procedure and calculation models should be provided by the legislation (Baumanė, Parsova 2010). All the above mentioned preconditions have been created in Latvia: information about objects and their characteristics is stored in the National Real Property Cadastre information system, information about real property market deals – in the Real Property Market information system, as well as cadastral assessment is regulated by legislation. To calculate the cadastral value of a particular object, five assessment models have been developed, and they are – assessment model for building land, assessment model for rural land, assessment model for buildings, assessment model for an apartment and assessment model for engineering technical objects (Baumanė, 2010).

Opportunities for applying the cadastral assessment models mainly depend on the information accrued in the Cadastre information system about the cadastral objects, as well as on the information registered in the Real Property Market database about the real property market deals.

The opportunities for the improvement of the cadastral assessment model of building land and rural land were resolved in the following way:

- first, qualitative improvement of the variable, based on actual and qualitative data and their acquisition opportunities;
- second, characterization of new variables, as well as the opportunities of obtaining and storing data characterizing them;
- an improved cadastral assessment model of building land has been developed.

Cadastral value of the real property is determined for the real property based on its composition, applying the following models - assessment model of building land, assessment model of rural land, assessment model of buildings, assessment model of apartments and assessment model of engineering buildings. Due to the limitations of the scientific research the author has studied improvement opportunities for the assessment models of building land and rural land in her paper from the aspect of the indicators affecting them.

Recognising research developed a basis for the following hypothesis - The improved cadastral assessment models provide a more objective cadastral value

According to the hypothesis, the **goal of the paper** is to analyze and evaluate improved cadastral assessment models.

To attain the goal, the following **objectives** were set:

- evaluate the advancement of cadastral assessment models using SWOT analysis;
- evaluate the advancement of cadastral assessment models using factor analysis.

2. MATERIAL AND METHOD

To assess the significance of the factors of the improved cadastral assessment models, the author has performed the factor ranking analysis (*Saaty, 1996*). The experts included two experienced high level practitioners and one scientist.

To do the analysis, based on the results of SWOT analysis, factors were clarified in the interviews with experts and ranks were assigned to every land assessment model for the use of the factor.

- 1 – the factor use is ineffective,
- 0 – the factor is not used,
- 0.5 – the factor is almost poorly used,
- 1 – the factor is poorly used,
- 1.5 – the factor is almost effectively used,
- 2 – the factor is used effectively.

As a result, several indicators were obtained, using which it is possible to determine the development direction for the analysed cadastral assessment models:

- *assessment of the rank of every factor* – to assess how it is used in each model;
- *ranking sum of the cadastral assessment models of building land and rural land* – to assess in which model in total the factors are used more effectively;
- *normalized score of the ranks of the cadastral assessment models of building land and rural land* – how many per cent of the total value of ranks is occupied by the particular cadastral assessment model of land in the experts' opinion:

$$\text{normalized score} = \frac{\text{sum}}{\text{totalsum}} \times 100 ,$$

where:

sum – sum of the experts' assessment of rankings of the cadastral assessment model of land;

totalsum – total sum of all the rankings of experts' assessment;

- *scattering of the rankings of the cadastral assessment models of building land and rural land* – free part, which is variable, assesses the factor force and determines the free space for their impact:

$$\text{scattering} = \frac{1}{2} \left(1 - \frac{\text{sum}}{\text{totalsum}} \right)$$

where:

sum – sum of the experts' assessment of rankings of the cadastral assessment model of land;

totalsum - total sum of all the rankings of experts' assessment.

3. RESULTS AND DISCUSSIONS

In the value theory there is an opinion that assessment models should be assessed evaluating their preciseness, stability over time and explain ability. The preciseness of the values created by the model can be assessed by research of the correlation of the determined values and market values, as well as by checking the property in reality. Stability over time can be evaluated by studying and comparing results from year to year (over at least a 5 year period). Explain ability evaluation helps to understand the indicators of the models and how they work in the model.

Due to the limitations of the research, when summarizing respondents' and experts' opinions, as well as the research results, the SWOT (strengths, weaknesses, opportunities, threats) analysis of the elaborated cadastral assessment models of land was performed.

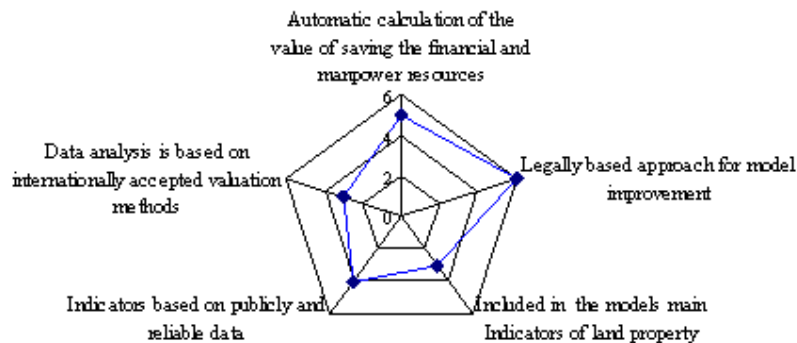
The SWOT analysis allows concluding that the improved cadastral assessment models have many advantages and strengths, which creates beneficial conditions for a qualitative application of the models to obtain more objective cadastral values.

Irrespective of the offered solutions, incomplete data in the National Real Property Cadastre information system and the information system of Real Property Market are among the main weaknesses because the data acquisition process is time-consuming.

One of the most important opportunities of the improved cadastral assessment models is an arranged normative basis of cadastral assessment, as a result of which it is possible to obtain a legally justified cadastral value for every property, as well as it allows understanding the nuances of determining the value.

But, on the other hand, the impact of the political and economic situation of the country, as a result of which radical changes in legislation are possible and thus also in the cadastral assessment process, can be considered a threat.

The pair analysis method was used for effective assessment to determine the most important of the mentioned factors. A net graph was designed for studying the most important factors (Fig.1). The net graph presents that the most important strengths factor is an innovative, legally justified approach to model improvement that allows understanding every indicator of the model, as well as its acquisition opportunities to apply the model. An important factor is also an automated value calculation which saves financial and labour resources, which allows obtaining objective cadastral value for every real property in the cadastral assessment process on a specific date.

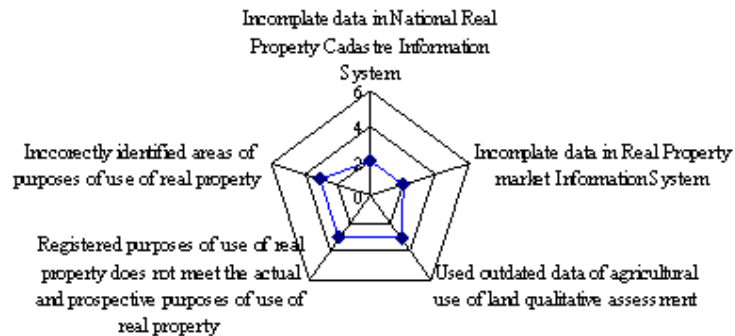


Source: author's designed

Figure 1. Net graph for the strengths of the improved cadastral assessment models

For studying the most important factors a net graph of weaknesses has been designed (Fig.2). The fact that out-dated data of agriculture use of land qualitative assessment (from 1989-90), data corresponding to the actual and perspective utilization purpose of real property, areas not

corresponding for the utilization purpose of real property are used has to be admitted as the most significant weaknesses factors that are in equal positions. Therefore the owners of real property should pay more attention to the correspondence of the utilizations purposes assigned to their real property and their area for the actual and perspective use.

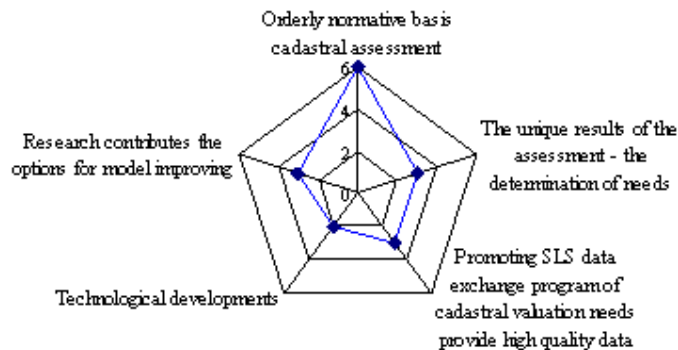


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Figure 2. Net graph for the weaknesses of the improved cadastral assessment models

As well, acquiring new data of agriculture use of land qualitative assessment at national level should be enhanced. The 2 other factors – incomplete data in the National Real Property Cadastre information system and in the information system of Real Property Market are in equal positions. Such a situation may worsen the objectiveness of the cadastral value.

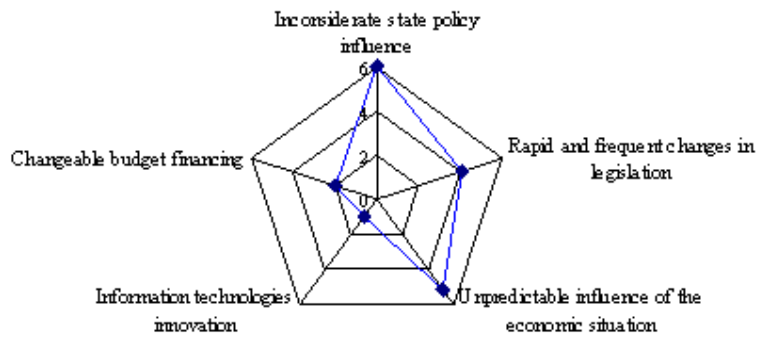
To study the most important factors, a net graph for the opportunities is designed (Fig 3). The most important factors regarding the assessment of opportunities are an arranged normative basis for cadastral assessment, as well as enhancing the SLS data exchange programme that would provide qualitative data acquisition for every indicator of the cadastral assessment model for the cadastral assessment purposes.



Source: author's designed

Figure 3. Net graph for the opportunities of the improved cadastral assessment models

To study the most important factors, a net graph for the threats is designed (Fig.4). The most important threats factors are the impact of country's policy and the impact of the economic situation because sharp political decisions that may be related with the economic situation in the country may significantly affect the cadastral assessment models, their application opportunities, as well as the end result – cadastral value. It is possible to resolve such a situation at a national level emphasising that the improved cadastral assessment models provide a more objective cadastral assessment with every year.



Source: author's designed

Figure 4. Net graph for the threats of the improved cadastral assessment models

Assessing the impact force of the factor in the improved cadastral assessment models in total, it can be concluded that there is a little opportunity still to comprise other factors affecting the improvement of cadastral assessment models. Therefore experts were asked to evaluate the alternatives of cadastral assessment models of building and rural land: the improved cadastral assessment model and the current cadastral assessment model.

Table 1. Analysis of factor ranking of the cadastral assessment models of building land

Factors	Alternatives – Cadastral assessment models of building land	
	The improved cadastral assessment model of building land	Cadastral assessment model of building land
Automated value calculation	2	2
Legally justified approach to the elaboration of models	2	2
Characterizing indicators of the land property	2	1
Public and reliable data	2	1
Data in the National Real Property Cadastre information system	2	1
Data in the Real Property Market information system	2	1
Purpose of use of real property	2	1
Areas of purpose of use of real property	2	1
Normative basis	2	1.5
Data exchange	2	1
Research	2	1.5
State policy	1.5	1
Economic situation	1.5	1
Budget financing	0.5	0.5
Ranking sum	25.5	16.5
Normal score	60.71	39.29
Scattering	0.19	0.30

Source: author's calculations based on the experts' assessment

The obtained results (Table 1) allow concluding that:

- the improved cadastral assessment model of land is stronger, which is approved by the ranking sum of the alternatives and the predominance of normal score, as well as the scattering 0.19, which means that the model successfully uses the effect of the factor impact force;
- such factors as automated value calculation that saves financial and labour costs and legally justified approach to the improvement of models are most successfully used in both models;
- the factor that has to be improved in both models is changing financing;
- the most significant differences between the cadastral assessment models of building land can be observed in 50% of cases when the factor is poorly used and when the factor is effectively used.

The obtained results (Table 2) allow concluding that:

- both cadastral assessment models of rural land are strong, which is approved by the scattering 0.20 and 0.30 respectively, which means that models successfully use the effect of factor impact force;
- the improved cadastral assessment model of rural land is stronger, which is approved by the ranking sum and the normal score;
- such factors as automated value calculation that saves financial and labour resources and legally justified approach to the improvement of models are most successfully used in these models;
- the factor that has to be improved in both models is changing financing;
- significant changes between the cadastral assessment models of rural land can be observed in factors related with the quality of data.

Table 2. Analysis of factor ranking of the cadastral assessment models of rural land

Factors	Alternatives – Cadastral assessment models of rural land	
	The improved cadastral assessment model of rural land	Cadastral assessment model of rural land
Automated value calculation	2	2
Legally justified approach to the elaboration of models	2	2
Characterising indicators of the land property	2	1.5
Public and reliable data	2	1
Data in the National Real Property Cadastre information system	2	1
Data in the Real Property Market information system	2	1
Purpose of use of real property	2	1
Areas of purpose of use of real property	2	1
Normative basis	2	1
Data exchange	2	1
Research	2	1.5
State policy	1.5	1.5
Economic situation	1.5	1.5
Budget financing	0.5	0.5
Ranking sum	25.5	17.5
Normal score	59.30	40.70
Scattering	0.20	0.30

Source: author's calculations based on the experts' assessment

Factor assessment in total justifies that the improved cadastral assessment models of building land and rural land are more qualitative, thus their application to cadastral assessment will allow determining a more objective cadastral value of real property.

4. CONCLUSIONS

1. Factor analysis of the SWOT analysis of the improved cadastral assessment models of land indicated that the most significant strengths factor is an innovative, legally justified approach to the elaboration of models, which allows understanding each indicator of the model, as well as its acquisition opportunities to apply them in the model, but the most significant weakness factors of the models in equal positions are the fact that outdated data of agriculture use of the land qualitative assessment (from 1989-90), data corresponding to actual and perspective purposes of use of real property and improper areas for the purpose of use of real property are used. Assessing the impact of external factors, the most significant opportunity factor is an arranged normative basis for cadastral assessment, but the most significant threat factor is the impact of inconsiderate state policy.
2. The factor ranking analysis of the factors of building land and rural land, with the obtained scattering of 0.19 and 0.20 respectively, allow concluding that by applying the improved cadastral assessment models of land to the cadastral assessment process a more objective cadastral assessment can be obtained.
3. Based on the evaluation of the benefits of the improved cadastral assessment models of building land and rural land, it can be concluded that qualitative real property data are obtained, which allow obtaining a more objective cadastral value, as well as a real property tax for every piece of real property.

5. REFERENCES

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