CLASSIFICATION IN REAL ESTATE TAXATION AND CADASTRAL VALUATION

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Abstract. This article analyzes the process of classification in real estate taxation and cadastral valuation. Within the framework of mass appraisal methods, the grouping of valuation objects and their adaptation to cadastral valuation models are studied. The concept of classification is considered a mandatory process in cadastral valuation, and its various directions—functional, territorial, and structural grouping-are examined. Based on the research results, proposals have been developed to enhance the role of classification in cadastral valuation and ensure accuracy in the valuation process.

Keywords: classification, cadastral valuation, real estate tax, grouping, categorization, cadastral value, mass appraisal, cadastral register, functional purpose, territorial grouping.

Mass appraisal of real estate refers to the process of determining the value by grouping valuation objects with similar characteristics. Within this framework, mathematical and other methods of value modeling based on valuation approaches are applied.

When determining cadastral value using mass appraisal methods, all valuation objects listed for state cadastral assessment are grouped based on an analysis of market data, justification of the cadastral valuation model, identification of value-forming factors, and determination of the values of these factors for each studied category of valuation objects. For each group of valuation objects, the valuer must select a valuation model that, based on value-forming factors, allows the calculation of the cadastral value for any valuation object within that group.

This leads to the conclusion that cadastral valuation involves the grouping of valuation objects and the establishment of a correlation between valuation object groups and valuation methods.

The term «grouping» is often used synonymously with «classification» In general, classification refers to the process of dividing a set of analyzed objects into homogeneous groups (in the sense of subsequent statistical analysis). The term «classification» is used to describe both the process of separation and its outcome, depending on the context.

Classification serves as a linking element between cadastral valuation and the registration of real estate objects in the cadastral agency.

It is important to note that the terms «grouping» and «classification» are also synonymous with «types» or «categories» For example, terms such as «permitted land use types of valuation objects» or «type of studied real estate object» are commonly encountered.

According to methodological recommendations for the state cadastral valuation of real estate, it is emphasized that:

The difference between determining value using mass appraisal methods and individual valuation methods lies in the volume of initial market data, information about the valuation object, and whether the object is typical or atypical. Additionally, the scope of assumptions underlying the valuation is also of significant importance. The process of determining value through mass appraisal methods essentially represents the process of assigning value based on classification of objects.

Thus, the primary method that is mandatory in cadastral valuation can be identified as classification. This is a scientific method of cognition, based on systematizing objects and grouping them through a generalized, idealized model or type.

The process of assigning objects to a specific group or classification type is called classification. Classification involves assigning an object a defining characteristic, known as a «type,» which identifies the sum of all its remaining attributes.

Classification issues arise in various fields of study that deal with highly diverse sets of objects, aiming to systematically describe and interpret them. Classification relies on identifying similarities and differences among the studied objects, as well as searching for appropriate identification methods and criteria.

The terms classification, grouping, and categorization are often used interchangeably in cadastral valuation of real estate (Table 1).

Table 1. Generalization of Terminology for Categorizing Valuation Objects

Process	Selection Criteria	Basis for Application	Process Outcome
Classification	Analysis of market data on valuation objects, justification of the cadastral valuation model, structure of price-forming factors, and determination of value-forming factors for each	Valuation objects are divided into groups based on valuation approaches and methodologies	**Types**

Process	Selection Criteria	Basis for Application	Process Outcome
	analyzed object type		
Categorization	Grouping by common characteristics, often related to functional use, structural properties, or market segmentation	Classification of objects based on standardized features for assessment purposes	**Classes**
Grouping	Logical segmentation based on valuation similarities and differences among objects	Establishing relationships between valuation methods and object characteristics	**Groups**

This table illustrates how different terminology is used when categorizing valuation objects in cadastral valuation and mass appraisal.

There are two methods for classifying a set of objects:

1. Partitioning the initial set of objects
2. Covering the initial set of objects

Partitioning refers to describing a given set as a system of mutually exclusive subsets that do not overlap.

Covering refers to representing a given set as a union of overlapping subsets, where the union fully contains the original set.

In cadastral valuation, the covering method is applied for classifying valuation objects. This is because, in general, valuation objects may have more than one permitted use type.

When determining cadastral value using mass appraisal methods, all valuation objects listed for state cadastral assessment can be grouped based on the following criteria:

- Analysis of market information on valuation objects
- Justification of the cadastral valuation model
- Identification of value-forming factors and their quantitative influence for each analyzed type of valuation object.

There is no definitive universal basis for classifying real estate objects for valuation purposes, as various factors and assumptions influence decisions regarding the number and composition of object classes, groups, or types.

To apply classification in cadastral valuation and study its possible foundations, methodological guidelines must be established for evaluating real estate objects subject to state cadastral valuation (e.g., buildings, rooms, structures, and unfinished construction projects).

According to these methodological recommendations, a hierarchical grouping system should be introduced to structure real estate objects and apply appropriate valuation methods. These classification levels are determined based on various characteristics, such as:

- Intended use,
- Location,
- Other value-affecting factors.

A hierarchical grouping system serves as the basis for simplifying and refining the valuation process by structuring objects into different levels of classification.

Based on the mandatory application criterion, classification levels are divided into:

1. Mandatory classification levels – determined by state valuation standards and market pricing conditions.

2. Non-mandatory classification levels – formed based on practical applications and applied when conditions allow.

The primary classification of real estate is based on the permitted use of the property. This stage of classification is considered mandatory, as the permitted use of the property being evaluated plays a decisive role in determining its value. The basis of classification lies in the principles of varying commercial value of properties and the different permitted uses of the properties being evaluated, which determine the difference in their value. This stage of classification is typically associated with the segmentation of the real estate market, where the main groups of properties being evaluated include apartments, single-family homes, garages, garden plots, as well as properties intended for commercial and industrial purposes, and other similar properties.

The second level of classification involves dividing real estate objects into completed and uncompleted construction. Uncompleted construction objects cannot be grouped together with completed construction objects.

The third level of classification entails dividing the subgroup «Completed Construction Objects» into smaller subgroups based on the following criterion:

«Objects with the possibility of determining exact location». Data on the objects being assessed allows for determining their location with precision up to the house, street, or cadastral block.

«Objects without the possibility of determining exact location». Data on the objects being assessed allows for determining their location only with precision up to the settlement, administrative district, or territory.

The third level of classification is introduced to describe the state of real estate registration and the availability of data on the location of real estate objects in the records. The application of the third level of classification is mandatory if there are objects for which it is impossible to determine the exact location.

The fourth and subsequent levels of classification are formed based on information about the market of appraisal objects, the justification of the cadastral value assessment model, the composition of value-forming factors, as well as data on the values of value-forming factors for each subgroup at the previous level.

Classification at the fourth level is based on the principles of identifying homogeneous subgroups from the perspective of appraisal. The number of distinguished classification levels depends on the degree of homogeneity of the appraisal objects. The main criterion for the final level of classification is adherence to the principle of homogeneity of appraisal objects within the subgroup, which allows for the calculation of the cadastral value of any appraisal object included in this subgroup in accordance with the selected appraisal method. Within a single subgroup, uniform approaches, calculation methods, and criteria for verifying the results must be applied. If different approaches, methods, models, verification criteria, etc., are used within a single subgroup, such a subgroup cannot be considered homogeneous.

Classification at the fourth and subsequent levels:

By territorial attribute – based on the belonging of objects to a certain type of settlement and their level of development. Typically, at the fourth level, depending on the territorial structure, the following subgroups are distinguished:

objects located in the center of the territory (large urban settlement);

objects located in urban settlements;

objects located in rural settlements.

By functional attribute – further classification of appraisal objects, identified at the first level of classification, by the type and purpose of functional use of the appraisal objects. Within the functional group, based on the criterion of homogeneity of objects, typical and unique objects are distinguished. Appraisal objects are classified within the group of permitted use as a special case of further classification.

Classification at the fourth and subsequent levels is closely related to the permitted use of appraisal objects (the first level of classification). In fact, it is at the fourth and subsequent levels of classification that the appraisal methods to be applied are determined, as the appraisal method corresponding to the group of appraisal objects is subsequently selected.

We have determined that typification is the main method of mass appraisal. To apply it, it is necessary to answer the following questions:

What problems arise in practice when implementing typification?

Is there sufficient data to apply typification to appraisal objects and their characteristics?

Based on what characteristics is the division of objects into types carried out? Are all of them accounted for and mandatory to fill out?

Are there contradictions in the description of objects that may lead to ambiguous typification? How are they resolved?

What changes need to be made to the legislative framework for real estate registration to address the identified issues?

To answer these questions, we conducted research.

For the application of typification in the state real estate cadastre, descriptions of real estate objects must be available that allow for typification within the framework of mandatory registration characteristics.

As a result of the analysis, it was found that there is no mandatory requirement to fill in the following characteristics, which are important for typification:

functional purpose (name) of buildings, premises, structures;

number of floors;

year of construction.

The lack of this data may negatively affect the typification process and its results, as well as reduce the accuracy and efficiency of cadastral valuation and taxation processes.

Typification is an important factor influencing the cadastral value. Let us examine specific examples to determine the relationship between typification and appraisal results.

For each group of permitted land use types, specific calculation methods and types of statistical modeling are applied, which align with precise statistical models for calculating cadastral value.

The distribution of real estate objects by permitted use types is carried out by the appraiser based on data from the state cadastre regarding land plots subject to cadastral valuation. When classifying land plots, the appraiser relies on mandatory registration characteristics from the state real estate cadastre, such as information on the permitted use of the plot, its location, ownership, and other available data.

Challenges of Typification:

The lack of characteristics in cadastral data that enable homogeneous classification of real estate objects for cadastral valuation purposes creates a challenge in applying typification. This leads to difficulties in assigning objects to specific groups, necessitates additional clarifications, assumptions, and hypotheses, and complicates and prolongs classification work within cadastral valuation processes.

Based on the conducted research, the following scientific innovations were concluded:

The main method of cadastral assessment is classification, a scientific method of knowledge, which is based on distinguishing object systems and grouping them using a generalized ideal model or type;

The process of placing objects into a specific group or classification type is called classification. Synonyms of classification - typing, grouping, and categorization - are often used in the methodological support of real estate cadastral assessment;

Classifying real estate objects by types of permitted use is a mandatory process in state cadastral assessment;

There are two methods of object collection classification: dividing the initial object collection and covering the initial object collection;

In the state real estate cadastre, it is necessary to add a mandatory description in a formalized (structural) form to the accounting characteristics of real estate objects:

«permitted use type» - for land plots;

«functional purpose» - for capital construction objects;

Characteristics like «number of floors», «year of construction», «wall material» must be filled without contradicting each other.

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