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**DEVELOPMENT OF THE METHODOLOGICAL AND  
INSTITUTIONAL FRAMEWORK FOR MASS APPRAISAL OF REAL  
ESTATE IN THE REPUBLIC OF MOLDOVA**

**521.03 – ECONOMICS AND MANAGEMENT BY FIELD OF  
ACTIVITY**

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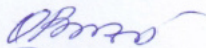
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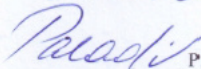
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## CONCEPTUAL LANDMARKS OF THE RESEARCH

### **Relevance and importance of the research topic**

In the context of the current geopolitical orientation of the Republic of Moldova, the modernization of public administration, and the need to strengthen the budgetary revenue base, mass appraisal of real estate assumes a strategic role. The development of a functional and coherent mass appraisal system becomes essential for ensuring fiscal equity, increasing transparency and efficiency in the taxation process, and fully capitalizing on the patrimonial potential of localities.

At present, the real estate valuation system used for fiscal purposes is affected by institutional fragmentation, insufficient updating of values, and the lack of a unified methodological framework. These deficiencies generate inequalities among taxpayers, encourage property undervaluation, and lead to imbalances in the distribution of the tax burden.

The relevance of the topic is further confirmed by the ongoing process of aligning the Republic of Moldova with international standards in real estate valuation. In this context, the integration of automated methods and the use of actual transaction data become imperative for enhancing the modernization and credibility of the national valuation system.

The scientific and practical importance of the topic derives from the role of mass appraisal not only as a technical instrument for determining taxable value, but also as a support tool for local development policies, spatial planning, investment attraction, and efficient management of public resources. In this regard, improving valuation methodologies, adapting them to the specific characteristics of the local real estate market, and strengthening a coherent normative and institutional framework become essential conditions for the functioning of a fair and sustainable fiscal system.

Therefore, the researched topic is unquestionably relevant, having a direct impact on budgetary sustainability, fiscal transparency, and administrative efficiency. At the same time, it provides a solid theoretical and methodological framework, relevant for the further development of scientific research in the field of real estate valuation.

From a scientific perspective, the thesis contributes to the expansion of the theoretical and conceptual framework of mass appraisal of real estate by coherently integrating economic, statistical, and institutional approaches adapted to the conditions of the Republic of Moldova. The role of location factors, property characteristics, and market dynamics within valuation models is substantiated. The research further develops the theoretical basis for applying modern econometric modeling methods in fiscal valuation and clarifies the relationships between mass appraisal, fiscal equity, and territorial development policies. The results contribute to strengthening an adequate scientific foundation for the modernization of the national valuation system.

### **Research aim**

The objective of the research is to develop a modern, efficient, and transparent methodological and institutional framework for the mass appraisal of real estate in the

Republic of Moldova, through the design of robust statistical models and the strengthening of institutional capacities required for their implementation.

### **Research objectives**

1. Analysis of theoretical foundations and concepts of mass appraisal of real estate;
2. Investigation of international experience and national practice in mass appraisal;
3. Identification of existing methodological, organizational, and legislative deficiencies;
4. Development and testing of log-linear hedonic models for residential property valuation;
5. Proposal of solutions for restructuring the institutional framework and improving market data collection and utilization;
6. Formulation of practical recommendations for implementing a sustainable, efficient, and transparent mass appraisal system.

### **Research hypotheses**

Hypothesis 1. Improving mass appraisal methodology through the application of log-linear hedonic models will increase the accuracy of estimated values, thereby enhancing fiscal equity and transparency in property taxation.

Hypothesis 2. Strengthening the institutional framework of mass appraisal, by consolidating state and local public authority capacities, will facilitate sustainable development of the mass appraisal system and reduce the negative socio-economic impact caused by its stagnation.

### **Theoretical Framework of the Research**

The theoretical framework of the research is grounded in the concepts of classical and neoclassical economics, developed by A. Smith, K. Marx, W. Pareto, and F. Hayek, which explain value formation, market functioning, and the role of property as an economic factor. In the field of real estate economics, the contributions of H. de Soto, A.N. Asaul, S.N. Ivanov, M.K. Starovoitov, and D. Friedman have been utilized, particularly with regard to property capitalization and real estate market dynamics. Legal aspects concerning the property rights regime were analyzed based on the works of C. Birsan and G. Lutescu, while cadastral issues and land administration were examined through the studies of L.J. Alston, G.D. Libecap, and R. Shindler.

The theoretical foundations of productivity and value formation are further complemented by the application of the Law of Diminishing Returns, formulated by A.R. Turgot and later developed by D. Ricardo and T. Malthus, as well as by the principles of fiscal equity addressed by D. Ricardo and H. George. The foundations of statistics and spatial econometrics are based on the classical works of J. Moran, L. Geary, and V. Whittle, while the application of regression analysis in real estate valuation is documented by J.H. Keith.

Modern concepts of Computer-Assisted Mass Appraisal (CAMA) are based on the research of J.K. Eckert, G. Gloudemans, W. Macclasley and R. Almy, who demonstrated the advantages of automating valuation processes. The development of spatial econometrics is associated with the contributions of A. Cliff and J. Ord, as well

as with the works of J. Paelinck and L. Klaassen, which consolidated the analysis of spatial autocorrelation and spatial dependence. Recent studies on real estate markets and investment behavior are represented by J.E. Stiglitz, J. Driffill, D.C. Ling, and W.R. Archer, authors of the well-established work of the Appraisal Institute (Ling & Archer). A significant contribution to mass appraisal theory is attributed to J.K. Eckert through the development of automated models centered on location factors. The specifics of post-Soviet evolution are addressed by O. Buzu and T. Kasyanenko, as well as by Russian scholars A.G. Greaznova, M.A. Fedotova, S.B. Gribovski, and S.A. Sivets, whose research focuses on mathematical modeling and regression analysis.

In the national literature, the research conducted by T. Bajura, I. Paladi, A. Muravski, O. Buzu, A. Matcov, S. Gorobievski, L. Dorofeeva, S. Albu, I. Albu, and N. Ţurcanu is particularly relevant, addressing issues related to the valuation of movable assets, asset management, taxation, and fiscal equity. A fundamental reference for the context of the Republic of Moldova is the habilitation thesis authored by O. Buzu, dedicated to the methodology of mass appraisal.

The present research aligns with this scientific tradition by formulating a systemic vision of mass appraisal adapted to the national legislative framework and the specific features of the local real estate market. At the same time, the study proposes an interpretation of classical and modern theoretical concepts through the lens of contemporary econometric and geographic tools. In this way, the link between value theory, statistical modeling, and fiscal valuation practice is strengthened, resulting in a coherent conceptual foundation for the modernization of the national system of mass appraisal of real property.

## **Research Methodology**

The research methodology integrated monographic analysis with a systemic approach in order to comprehensively investigate the processes of real property mass appraisal. At the theoretical level, methods of analysis and synthesis, induction and deduction, comparison, and scientific abstraction were applied, which are essential for identifying interdependencies among economic, legal, and technical factors influencing property value formation.

From an applied perspective, the study employed multiple and log-linear regression models, calibrated with respect to location factors, physical property characteristics, and the temporal dynamics of the market. The empirical basis consisted of cadastral data and real transaction information, subjected to rigorous procedures of data cleaning, validation, and standardization. Statistical processing and modeling were carried out using specialized software tools, particularly RStudio, in collaboration with experts involved in the Land Registration and Valuation Project (LRVP).

The performance of the proposed models was verified through comparative analyses with currently used systems and by testing on representative samples of real properties. The ratio study method was applied for coefficient calibration and for assessing consistency between estimated values and actual market indicators. Empirical validation included the use of statistical indicators of accuracy and stability, the results

of which confirm both the methodological robustness of the models and the practical relevance of the formulated conclusions.

### **Scientific novelty**

The scientific novelty of the research consists in the integrated theoretical and methodological substantiation of mass appraisal of real estate in the context of the Republic of Moldova, through coherent correlation of economic, legal, and technical aspects, and by formulating empirically validated applied solutions. In particular, the original contributions include:

1. Conceptual definition and systematization of mass appraisal as a distinct process within real estate valuation, differentiated by purpose, data volume, methodologies, and level of automation;
2. Development of a comparative theoretical and normative framework based on international practices and adapted to national institutional and legislative specificities;
3. Justification of the need to reform the existing valuation system through a unified, transparent, and replicable methodology based on interoperable databases;
4. Development and testing of multiple regression-based models applied to real residential market data, demonstrating the feasibility of automated appraisal;
5. Formulation of methodological and institutional recommendations aimed at establishing a unified, sustainable national mass appraisal system to support equitable property taxation.

### **Main scientific results submitted for defense**

The thesis represents a scientific and practical contribution to addressing the problems generated by the inefficient management of the mass appraisal process of real estate. It provides a modern methodological framework and operational tools capable of improving the accuracy of value estimates and the transparency of fiscal decision-making. At the same time, the study creates the premises for strengthening institutional capacity and aligning the national mass appraisal system with European standards. In this context, the roles and functions of the mass appraisal system are clarified, highlighting not only its primary purpose—determining taxable values—but also its broader applications in areas such as spatial planning, public asset management, and real estate market analysis, confirming its strategic relevance for public policy development. Through the analysis of international practices and the evolution of the national system, the research identifies both the key benchmarks for modernization and the existing gaps that limit its current development. A detailed investigation of system dysfunctions reveals their impact on valuation quality, fiscal equity, and the stability of local budget revenues, thus substantiating the need for systemic interventions. Based on these findings, the study proposes applied methodological and institutional solutions, including the development and testing of original mass appraisal models for residential properties. These models demonstrate a significant improvement in estimation accuracy and a reduction in errors compared to currently used approaches. The recommendations focus on: modernizing data collection and management mechanisms; recalibrating and periodically reviewing valuation models; strengthening professional competencies; and

harmonizing the regulatory framework. Together, these measures contribute to the establishment of an efficient, transparent, and sustainable mass appraisal system.

The obtained results have contributed to solving a *scientific problem* of applied nature—namely, the development of methodological and institutional foundations for a mass appraisal system of real estate in the Republic of Moldova, aimed at improving ad valorem property taxation while ensuring the principles of equity and transparency.

### **Practical Value**

The practical relevance of the research lies in the direct applicability of its results for optimizing the organization and functioning of the mass appraisal system of real estate. The applied value of the study can be outlined as follows:

1. At the methodological level, the applied value consists in the development of econometric models and operational procedures adapted to the specific characteristics of the real estate market in the Republic of Moldova. These allow property values to be estimated in a more substantiated, replicable, and transparent manner. The research proposes: mechanisms for the selection and validation of explanatory variables; techniques for model calibration and periodic recalibration; standardized procedures for model evaluation. These ensure the coherence and comparability of results over time and across regions. The integration of these tools facilitates the transition from traditional rule-based approaches to empirically grounded analytical models capable of reflecting real market dynamics.

2. At the institutional level, the research provides an applied framework for reorganizing and strengthening administrative capacity within entities involved in mass appraisal. It includes: proposals for the functional delimitation of responsibilities between institutions; mechanisms for effective inter-institutional coordination; and the development of professional competencies through continuous training programs. Additionally, the study emphasizes the need for integrated information systems ensuring interoperability between cadastral, fiscal, and statistical databases, as well as controlled and transparent access to relevant data for all stakeholders.

3. At the operational level, the applied value is reflected in the improvement of data collection, validation, and updating processes through the use of multiple data sources and digital technologies.

This leads to: reduced administrative costs; increased efficiency of the valuation process. The research also proposes solutions for automation of critical stages, including: generation of taxable values; and quality monitoring of valuation outputs; thus, contributing to the standardization and scalability of the system.

4. At the normative and public policy level, the results can support reforms in property taxation, including: introduction of regulations for periodic value updates; strengthening appeal procedures; and increasing decision-making transparency.

The recommendations facilitate the alignment of the national framework with European standards and practices, enhancing the system's credibility and sustainability.

Overall, the applied value of the thesis lies in its capacity to provide integrated, feasible, and scalable solutions that can be gradually implemented to transform the mass



appraisal system into an efficient instrument for fiscal administration and a data-driven support tool for public policy.

### **Implementation of Scientific Results**

The research results have been utilized both scientifically and practically, being presented and validated at workshops, congresses, conferences, and specialized seminars, where they were subject to discussion and benefited from feedback from the academic community and field practitioners.

A significant part of the conclusions and proposed solutions has been incorporated into the process of developing and improving the national regulatory framework (Order No. 39/2023, AGCC) and (Order No. 91/2023, AGCC), which concern the calculation of the taxable base for apartments and individual houses in urban areas.

The integration of these results into official regulations confirms the relevance and applicability of the research, as well as its capacity to generate a tangible impact on the functioning of the mass appraisal system of real estate.

### **Delimitation of the Research**

The research was focused on the valuation of residential real estate in urban areas, based on statistical and transaction data collected within the Land Registration and Property Valuation Project (2018–2024).

The analysis targeted apartments and individual housing units in urban localities, as this segment is the most representative for the application of mass appraisal models and for supporting local-level fiscal policy development.

### **Validation and Approval of Research Results**

The research results were presented at five scientific and scientific-practical conferences, two symposiums, and five workshops at both national and international levels, including events held in Chişinău (Moldova), Varna (Bulgaria), Denver (USA), Tallinn (Estonia), and Vilnius (Lithuania).

The main theoretical provisions and technical conclusions of the research were presented and discussed within these scientific forums, both nationally and internationally. This process enabled their validation and refinement through expert feedback, contributing to the strengthening of their scientific and practical relevance.

Through these contributions, the research supports the development of the conceptual and methodological framework in the field of mass real estate appraisal and promotes practical solutions for improving value-based fiscal systems.

The recommendations and proposals formulated have been utilized in the implementation process of the Land Registration and Property Valuation Project (PIEF), contributing to the development and enhancement of an updated mass appraisal system implemented by the State Enterprise “Cadastru” and subsequently by the Agency for Geodesy, Cartography and Cadastru.

The implementation of these proposals ensures not only the improvement of valuation quality and transparency of decision-making, but also the establishment of a stable institutional and regulatory framework capable of supporting the long-term

development of the property taxation system and responding to the requirements of a modern, data-driven economy.

**Keywords:** real estate property, mass appraisal of real estate, property tax, valuation model, mathematical regression, methodological framework, institutional framework.

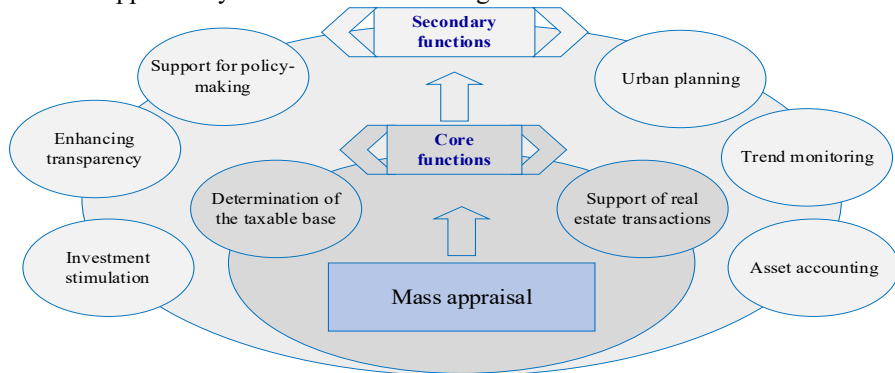
## CONTENT OF THE DISSERTATION

### Chapter I. Conceptual Foundations of Real Property Mass Appraisal

Chapter I provides a comprehensive synthesis of the conceptual foundations of real property mass appraisal, correlating value theory with fiscal mechanisms and relevant professional standards (IAAO, 2013; IVSC, 2017). The role of the mass appraisal system is outlined through the description of its primary and secondary functions. In this context, mass appraisal is conducted essentially for the purpose of property taxation, with the obligation to ensure the equitable application of taxes and duties in accordance with the market value of properties (Law No. 1163/1997).

According to international valuation standards, the values estimated within mass appraisal must comply with two fundamental principles: vertical equity, whereby value is proportional to the quality of the property, and horizontal equity, which requires that similar real properties have relatively equal values (IAAO, 2013).

While the mass appraisal system primarily serves as a basis for property taxation, it also performs a range of complementary functions, such as supporting an efficient land market, facilitating fair compensation in cases of compulsory acquisition, and strengthening the role of land and property as fundamental assets of the national economy (Di Porto Ed., Oliviero T., Tirozzi A., 2019). In addition to determining the taxable base required for calculating taxes and duties, an updated and coherent mass appraisal system can make a significant contribution to urban planning by providing relevant data for territorial development. At the same time, it enables the monitoring of real estate market trends and provides essential information for the formulation of public and private decisions. The system enhances transparency and the level of information available to market participants, ultimately facilitating transactions by ensuring objective and standardized valuation. In schematic form, the division of the functions of the mass appraisal system is illustrated in Figure 1.



**Figure 1. Functions of the Mass Appraisal System**

*Source: elaborated by the author*

The review of the specialized literature highlights the transition from deterministic models, based on uniform multipliers, to statistical models capable of extracting meaning from observable data (Rosen, 1974; Malpezzi, 1997). The hedonic approach transforms market price into a function of a vector of characteristics, allowing value to

be decomposed into its components and enabling the estimation of the marginal contribution associated with each property attribute. The use of the log-linear functional form is justified both by theoretical arguments—particularly the ease of interpreting elasticities—and by empirical considerations, such as variance stabilization and the reduction of the influence of extreme values in datasets (World Bank, 2020; Almy, 2013; OECD, 2021).

In addition, the legal and institutional premises of mass appraisal are examined, with emphasis placed on the need to harmonize the cadastral framework with the regime governing transaction disclosure, personal data protection regulations, and fiscal competencies. In the absence of a unified, interoperable, and verified database, any model risks generating systematic errors. For this reason, the chapter argues for the establishment of a national register of prices and values, standardized addressing norms, and unique identifiers for real properties, transactions, and subsequent changes in the physical condition of buildings.

To clearly define the specific features of mass appraisal, a detailed comparison is conducted between the essential elements of individual appraisal and those of mass appraisal. The distinction between the two approaches is analyzed in depth: while individual appraisal responds to specific market needs or litigation contexts, mass appraisal aims at the simultaneous estimation of a large number of properties through standardization and automation, ensuring consistency of treatment and transparency of criteria. The specific requirements of mass appraisal are substantiated, emphasizing that it must be cyclical and periodic, include clear procedures for model recalibration, and be subject to transparent audit mechanisms.

Table 1 provides a synthesized comparative overview of the main differences between individual appraisal and mass appraisal, highlighting the objectives, methods, volume of properties analyzed, degree of automation, and application criteria characteristic of each approach.

***Table 1. Comparative Analysis of Individual Appraisal and Mass Appraisal***

<b>No.</b>	<b>Criterion</b>	<b>Individual Appraisal</b>	<b>Mass Appraisal</b>
1.	Object of appraisal	A single property	Multiple properties within defined zones
2.	Results	Precise and case-specific	Generalized but operationally useful estimates
3.	Purpose	Market transactions and legal purposes	Property taxation
4.	Valuation date	Determined by the client's request	Established by legislation
5.	Methodology	Detailed analysis and on-site inspection	Statistical models and aggregated data
6.	Data currency	Up-to-date and property-specific data	More general and aggregated data

No.	Criterion	Individual Appraisal	Mass Appraisal
7.	Application of principles	Local valuation principles and regulations	Primarily based on cadastral data
8.	Individual characteristics	In-depth analysis of property attributes	Rapid estimation without detailed inspection
9.	Objectivity	Personalized and case-specific	Standardized and less individualized
10.	Applied factors	Detailed and property-specific factors	Standardized factors
11.	Uniformity	Varies among appraisers	Uniform, automated calculation
12.	Quality indicators	Higher precision indicators	Lower precision indicators

*Sursa: elaborat de autor în baza surselor bibliografice (Buzu, 2012). Versiunea detaliată este prezentată în Tabelul 1.2 al lucrării.*

The paper emphasizes the fundamental principles underpinning real property mass appraisal, namely objectivity, standardization, relevance, transparency, and quality control, complemented by the economic concepts of synergy and diminishing returns. These principles collectively ensure that valuation outcomes are consistent, replicable, and aligned with observable market behavior. A clear distinction is drawn between individual appraisal, which concentrates on the unique physical, legal, and functional characteristics of a single property, and mass appraisal, which operates through statistical modeling and systematic data processing. While individual appraisal is tailored to specific transactional or legal purposes, mass appraisal is designed to estimate values for large property stocks simultaneously, making it particularly suitable for fiscal, planning, and policy-related applications, while adhering to the principle of highest and best use.

The chapter further highlights the central role of mass appraisal in the functioning of the modern economy. Particular emphasis is placed on the principles of vertical equity—according to which property values increase proportionally with quality and utility—and horizontal equity, whereby properties with similar characteristics and market positions are assigned comparable values (IAAO, 2013). These principles are essential for ensuring fairness in property taxation and for maintaining public trust in valuation-based fiscal systems. Mass appraisal also facilitates the alignment of the tax burden with real estate market cycles, thereby reducing distortions arising from time lags between market changes and tax base updates. By minimizing valuation disparities among comparable taxpayers, mass appraisal reduces incentives for fiscal arbitrage and enhances the perceived legitimacy of the taxation system. Moreover, the systematic use of market-derived data supports evidence-based urban planning and territorial development policies.

A critical issue addressed in the chapter concerns the risks associated with outdated or inadequately maintained tax bases. Discrepancies between estimated values and actual market conditions can undermine fiscal equity, generate administrative

inefficiencies, and lead to increased social costs. In such contexts, governments may resort to administrative adjustments of tax rates, which can disproportionately affect certain categories of taxpayers and erode confidence in public institutions. The analysis underscores that accurate, regularly updated mass appraisal systems represent a more sustainable alternative to discretionary fiscal interventions.

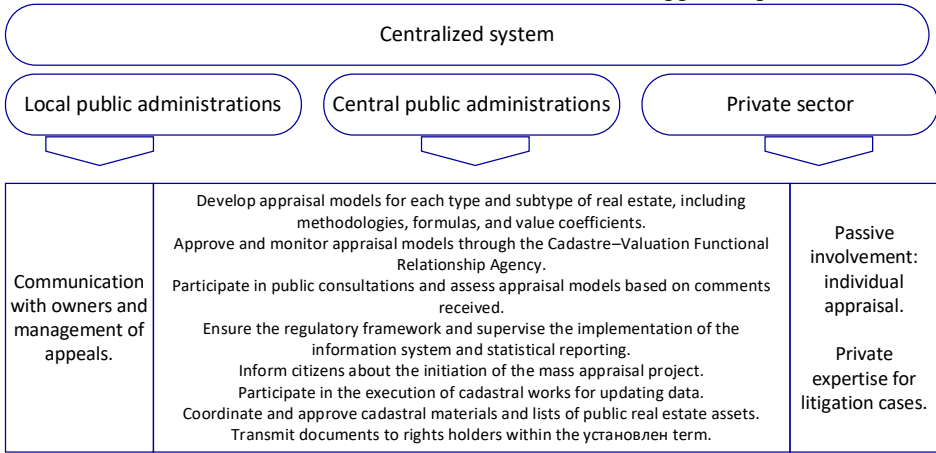
From a methodological perspective, the chapter provides a rigorous justification for the selection of quality indicators recommended by the International Association of Assessing Officers (IAAO), namely the median ratio, the coefficient of dispersion (COD), and the price-related differential (PRD). These indicators serve as key benchmarks for assessing appraisal level, uniformity, and equity. The chapter discusses expected threshold values for residential property segments and explains how these benchmarks guide the calibration and refinement of valuation models. Special attention is given to the use of log-linear specifications and hedonic modeling frameworks, which allow for the interpretation of marginal effects and elasticity while improving statistical robustness.

The selection of optimal model specifications is further supported through the application of the Akaike and Bayesian Information Criteria (AIC/BIC), which balance model fit against parsimony. To ensure predictive reliability and to mitigate the risk of overfitting, the chapter advocates the use of validation procedures based on holdout samples and k-fold cross-validation techniques (Bourassa et al., 2006). These procedures enhance model stability and ensure that valuation outcomes remain consistent across different samples and time periods.

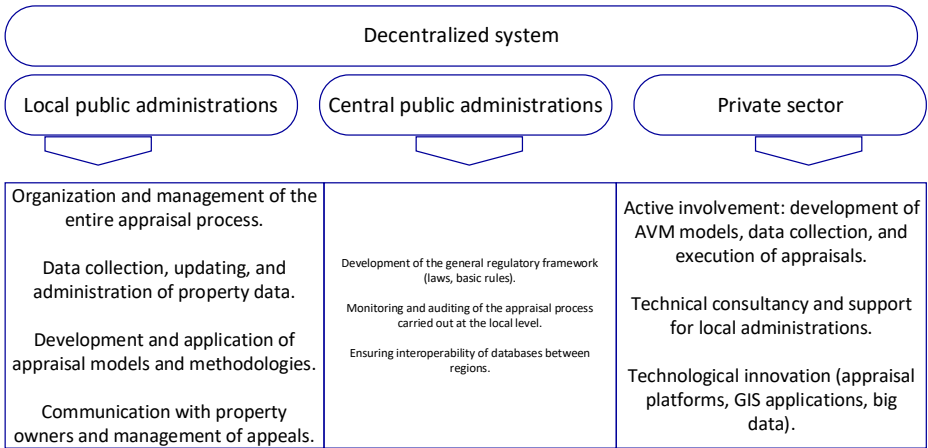
In addition to technical considerations, the chapter addresses the organizational and legal dimensions of mass appraisal. Key aspects include the public disclosure of valuation methodologies, the transparency and explainability of models for taxpayers, the formal right to appeal assessed values, and the requirement for independent external audits (UNECE, 1996). Within this framework, mass appraisal is conceptualized as a public good that generates positive externalities, such as improved market transparency and more efficient public finance management, while simultaneously imposing strict requirements for accountability and governance.

The chapter further examines institutional arrangements for mass appraisal, comparing centralized and decentralized systems as alternative governance models. Centralized systems offer advantages in terms of methodological uniformity, data standardization, and quality control, whereas decentralized systems provide greater flexibility and responsiveness to local market conditions. The analysis evaluates these models with respect to administrative efficiency, transparency, and public acceptance of valuation outcomes. Ultimately, the chapter argues that a functional balance between centralized coordination and local operational flexibility is essential for the successful implementation of a modern and credible mass appraisal system. Such a hybrid approach enables the consistent application of standards while preserving the

adaptability required to reflect spatial and market heterogeneity, thereby strengthening both the technical and institutional foundations of mass appraisal practice.



**Figure 1. Allocation of Institutional Responsibilities in the Centralized System of Real Property Mass Appraisal for Taxation Purposes**  
*Source: elaborated by the author*



**Figure 3. Allocation of Institutional Responsibilities in the Decentralized System of Real Property Mass Appraisal for Taxation Purposes**  
*Source: elaborated by the author*

Figures 2 and 3 illustrate the redistribution of functions assigned to central public authorities within the mass appraisal process, while simultaneously highlighting the increased involvement of local authorities and the private sector. This decentralization supports the reduction of budgetary expenditures and limits errors associated with the uniform application of valuation models.

Table 2 presents the advantages and limitations of centralized and decentralized institutional models, facilitating a comparative assessment of their efficiency, transparency, and degree of adaptability to local conditions.

*Table 2. Advantages and Limitations of Institutional Models*

<b>Institutional Model</b>	<b>Advantages</b>	<b>Limitations</b>
<b>Centralized</b>	<ul style="list-style-type: none"> <li>• Ensures methodological uniformity and regulatory coherence.</li> <li>• Achieves economies of scale through the use of a shared IT infrastructure.</li> <li>• Enables more effective control over quality standards and performance indicators.</li> </ul>	<ul style="list-style-type: none"> <li>• Risk of rigidity and limited adaptability to local market conditions.</li> <li>• Excessive administrative burden on the central authority.</li> <li>• Potential delays in data updating.</li> </ul>
<b>Decentralized</b>	<ul style="list-style-type: none"> <li>• Capitalizes on local knowledge and market-specific characteristics.</li> <li>• Greater flexibility in data collection and verification processes.</li> <li>• Active involvement of local administrations and taxpayers.</li> </ul>	<ul style="list-style-type: none"> <li>• Risk of methodological fragmentation.</li> <li>• Variations in quality across regions.</li> <li>• High coordination and subsequent standardization costs.</li> </ul>
<b>Hybrid</b>	<ul style="list-style-type: none"> <li>• Combines methodological uniformity with local adaptability.</li> <li>• Centralized governance of methodology and data, with regional execution.</li> <li>• Enables bidirectional feedback between central and local levels.</li> </ul>	<ul style="list-style-type: none"> <li>• Requires clear delineation of responsibilities.</li> <li>• Potential risk of institutional overlap.</li> <li>• Necessitates interoperable IT infrastructure and advanced coordination mechanisms.</li> </ul>

*Source: elaborated by the author*

From an organizational perspective, the chapter analyzes centralized and decentralized mass appraisal systems. The centralized model provides methodological consistency and economies of scale, while decentralized approaches capitalize on local knowledge and faster responsiveness to market dynamics. The study recommends a hybrid model based on a unified methodology, national-level data governance, regionally implemented valuation processes with clearly defined responsibilities, and public monitoring of quality indicators.

**Chapter II. Practical Implementation of the Methodology for Real Property Mass Appraisal** moves from theoretical analysis to an applied perspective, examining the institutional experiences of countries with well-established mass appraisal systems. The chapter presents models from the United States and Canada, where local authorities hold primary responsibility, and mass appraisal is conducted through CAMA platforms integrated with property registers and GIS systems (Eckert, 1990; IAAO, 2013). Emphasis is placed on the importance of post-appraisal audits, annual reviews, and independent appeal mechanisms. Table 3 synthesizes the essential characteristics of real property mass appraisal for fiscal purposes in international practice.



**Table 3. Characteristics of Real Property Mass Appraisal for Fiscal Purposes in International Practice**

<b>Country / Region</b>	<b>Object of Appraisal</b>	<b>Tax Base</b>	<b>Type of Institutional System</b>	<b>Revaluation Periodicity</b>
Sweden	Complex property	Market value	Centralized / Cadastre	Every 5–6 years; annual indexation
Germany	Separate: land and buildings	Combined	Decentralized / Fiscal authorities	Every 8–20 years; annual indexation
China	Not subject to property taxation	–	Centralized / Fiscal authority	Pilot projects
France	Separate: land and buildings	Rental value	Centralized / Cadastre	Every 5–6 years; annual indexation
Netherlands	Complex property	Market value	Decentralized / Municipal valuation services / private firms	Every 4 years; annual indexation
Slovenia	Complex property	Market value	Centralized / Valuation authority	Every 5 years; annual indexation
USA and Canada	Complex property	Market value	Decentralized	Every 5–6 years
United Kingdom	Complex property	Market value	Decentralized	Every 10 years
Belgium	Data not available	Market value	Centralized / Cadastre	Every 8–20 years
Spain	Separate: land and buildings	Market value	Centralized / Cadastre	Every 8–20 years
Italy	Data not available	Data not available	Centralized / Cadastre	Every 8–20 years
Australia	Complex property	Market value	Decentralized / Fiscal authorities	Every 8–20 years
Denmark	Complex property	Data not available	Decentralized / Fiscal authorities	Every 4 years
Russia	Complex property	Cadastral value	Decentralized / Regional budget departments	Every 5 years
Lithuania	Land	Market value	Centralized / Cadastre	Every 5 years
Poland	Complex property	Market value	Centralized / Cadastre	Pilot project

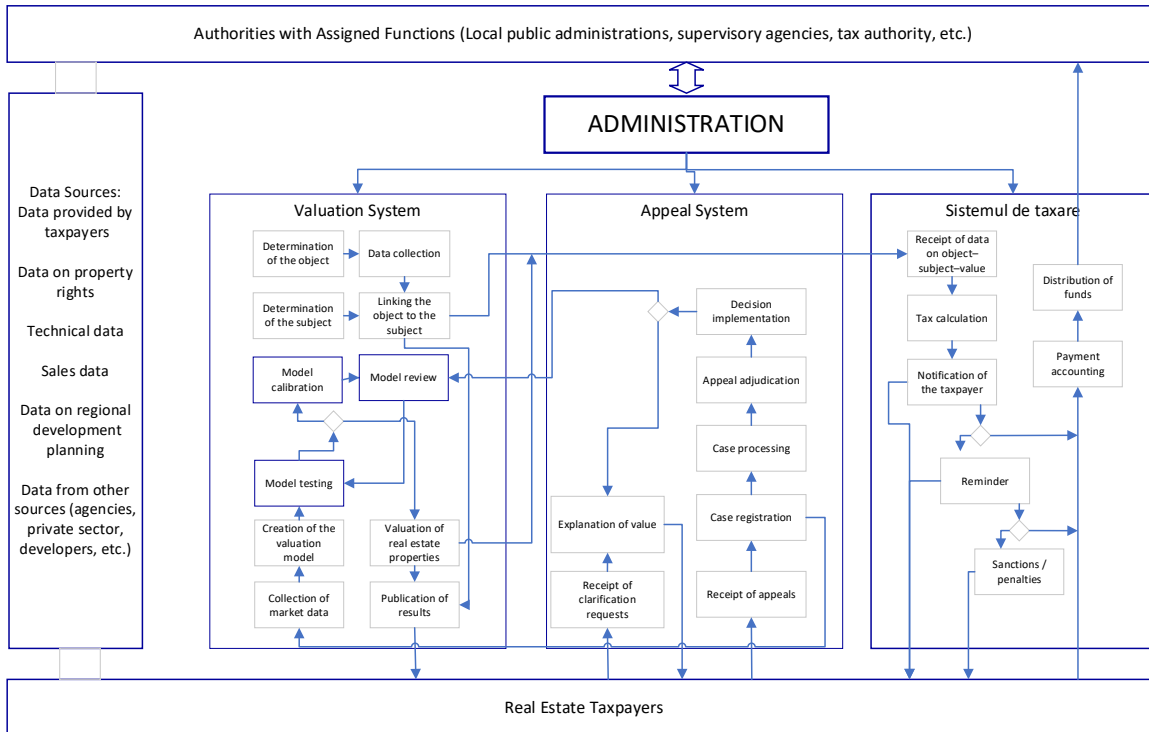
<b>Country / Region</b>	<b>Object of Appraisal</b>	<b>Tax Base</b>	<b>Type of Institutional System</b>	<b>Revaluation Periodicity</b>
Romania	Complex property	Market value	Decentralized / Private sector	Individual basis
Türkiye	Complex property	Normative value	Centralized / Cadastre	Pilot project

*Source: elaborated by the author based on bibliographic sources (Eckert, 1990; IAAO, 2013; World Bank, 2020).*

The European context provides significant examples through the establishment of clear quality standards and the multi-source integration of data, including fiscal, notarial, cadastral, and statistical registers. In the Baltic states, early digitalization enabled the publication of value maps and local-level quality reports, creating an effective feedback mechanism between authorities and taxpayers.

With regard to the Republic of Moldova, the dissertation highlights the specific characteristics of the local real estate market, the institutional organization of the mass appraisal system, and the structure of its operational processes. The chapter examines developments during the 2004–2007 period, when the basic methodology of the mass appraisal system was established, and analyzes the resources mobilized through the Land Registration and Valuation Project (LRVP, 2018–2026), emphasizing how data collection and standardization contribute to strengthening the system’s core methodological performance.

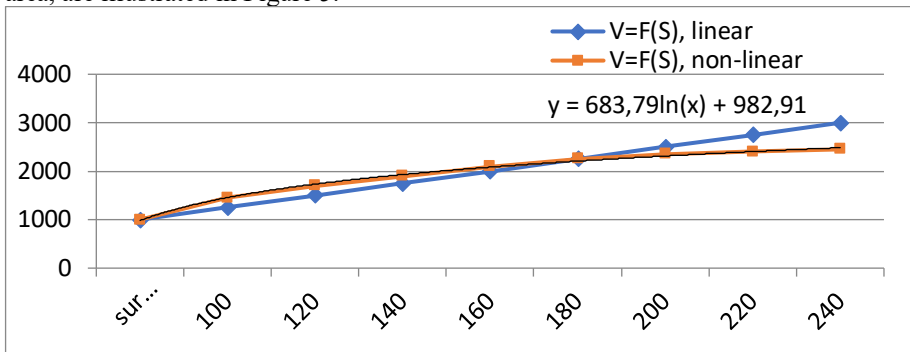
The structure of the real property cadastre, its organizational chart, and related processes are analyzed, including the organization and management of technical and legal data on real properties. At the same time, the institutional framework of real property mass appraisal in the Republic of Moldova is described, highlighting its integration within the cadastral system and the way functional linkages are established with the appeals system and the fiscal administration. In schematic form, the structure of the operational processes of the mass appraisal system in the Republic of Moldova is presented in Figure 4.



Particular attention is devoted to ensuring interoperability among information systems through the integration of the real property cadastre with the fiscal administration, address infrastructure, notarial registers, and GIS platforms. A data architecture based on unique identifiers and web services is presented, facilitating the periodic updating of valuation models and the real-time publication of value maps.

A distinct section of the study highlights the current challenges of the real property mass appraisal system in the Republic of Moldova. The author identifies three major structural deficiencies: (i) incomplete and non-harmonized transaction data, (ii) an outdated methodology based on low-granularity multipliers, and (iii) fragmentation of institutional roles. The dissertation documents market data errors, including duplicates, inaccurate geocoding, and the absence of essential variables. The quality of existing models is assessed using established indicators such as adjusted  $R^2$ , the coefficient of dispersion (COD), and the price-related differential (PRD), together with specific quality tests.

The thesis quantifies the negative pecuniary impact of methodological non-compliance—such as omitted variables and inappropriate weighting—by employing *ex ante* and *ex post* simulations across taxpayer categories and analytical zones. In addition, through case studies, the research examines the effects of an imbalanced sequencing of institutional actions—cadastral updating, revaluation, communication, and appeal procedures—highlighting their impact on fiscal equity and revenue stability. As a concrete example, estimated annual fiscal losses of approximately EUR 2 million, generated by the improper application of the inter-factor regression between value and area, are illustrated in Figure 5.



**Figure 5. Losses Generated by the Use of Linear Regression on Total Floor Area in Calculating the Taxable Value of Apartments in Urban Residential Buildings**  
Source: elaborated by the author.

Figure 5 presents the diagrams of linear and nonlinear regression functions, illustrating the relationship between apartment values and their floor area. The superposition of the curves highlights the ranges in which estimated values diverge depending on the regression model applied. The table displayed in the lower part of the figure summarizes

variations in apartment values across defined segments for the entire national housing stock.

**Table 4. Synthesis of the variation in apartment values based on linear regression and nonlinear regression**

Floor Area (m <sup>2</sup> )	Number of Units	Share (%)	Difference per Unit (EUR)	Difference per Group (EUR)
<20	19547	4,3%	-2000	-39094000
20-30	32191	7,0%	-3000	-96573000
30-40	73267	16,0%	-5000	-366335000
40-50	104293	22,7%	-6000	-625758000
50-60	80397	17,5%	-5000	-401985000
60-70	90221	19,7%	-5000	-451105000
70-80	27882	6,1%	-5000	-139410000
80-90	13641	3,0%	-3000	-40923000
90-100	7238	1,6%	0	0
100-110	3683	0,8%	5000	18415000
110-120	2434	0,5%	10000	24340000
120-130	1441	0,3%	17000	24497000
130-140	858	0,2%	23000	19734000
>140	1831	0,4%	30000	54930000
Total	458924	100%		-489522000

*Source: elaborated by the author.*

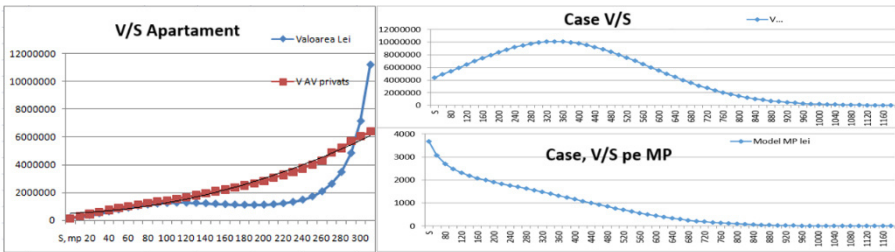
Figure 5 presents the diagrams of linear and nonlinear regression functions, illustrating the relationship between apartment values and their floor area. The superposition of the curves highlights the ranges in which estimated values diverge depending on the regression model applied. The table displayed in the lower part of the figure summarizes variations in apartment values across defined segments for the entire national housing stock. The aggregation of these differences shows that the underestimation of values—caused by the application of an inappropriate linear regression model—amounts to approximately EUR 490 million, generating annual fiscal losses of about EUR 2 million.

**Chapter III. Methodological and Institutional Development of Real Property Mass Appraisal in the Republic of Moldova** presents a coherent set of proposals aimed at strengthening the real property mass appraisal system. These include: revising the property classification system and harmonizing it with market realities; implementing data profiling and cleaning procedures—such as duplicate reduction, address harmonization, normalization of measurement units, detection of outliers (IQR, robust z-score), prudent imputation of missing data, and encoding of categorical variables; combining statistical methodology with expert-analytical approaches to integrate local knowledge; improving data quality through profiling, deduplication, and spatio-temporal validation; operationalizing log-linear models within institutional workflows; mitigating the effects of uncontrolled synergy, diminishing returns, and multicollinearity through variable selection, regularization, and quality testing

(predictability and stability); eliminating arbitrary equalization assumptions between vacant land value and land associated with buildings; applying differentiated treatment to land market dynamics versus building markets; explicitly modeling location effects; and integrating the technical condition of buildings into value modeling.

Subsequently, the proposed solutions are operationalized through log-linear hedonic models for residential segments (urban apartments and single-family houses), in which the logarithm of unit price is explained by physical, functional, and locational variables. Inter-factor regressions are constructed, polynomial age effects and relevant interactions are introduced, and spatial heterogeneity is captured through hierarchical zonal coding. The modeling process includes variable selection based on information criteria, control of multicollinearity (VIF), treatment of heteroscedasticity using robust estimators, identification and management of influential observations, and validation of parameter stability. Out-of-sample testing, simulation of extreme conditions, and residual map analysis guide iterative recalibration until quality thresholds are met. Overall, the integration of these procedures ensures more accurate estimates, methodological transparency, and operational robustness in the application of results.

Examples of the calibration of area-related factors for the analyzed categories are presented in Figure 6.



**Figure 6. Results of Testing and Calibration of the Baseline Regressions for Apartments and Residential Houses**

*Source: elaborated by the author.*

Model quality assessment is carried out on two complementary levels. At the econometric level, statistical performance indicators—such as adjusted  $R^2$ , standard errors, and t-statistics—are reported, while at the operational level, mass appraisal-specific indicators (median ratio, coefficient of dispersion (COD), and price-related differential (PRD)) are calculated on independent samples. The combination of these results provides a comprehensive and robust evaluation of model feasibility.

The chapter presents case studies illustrating how log-linear models reduce rate dispersion and the price-related differential compared with systems based on one-dimensional multipliers (Paladi, 2024a; Paladi, 2024b). The performance of traditional models is explicitly compared with that of hedonic specifications through the application of the ratio study technique. The results show that log-linear models achieve the quality indicators recommended by the IAAO (IAAO, 2013) for residential

segments, leading to a substantial reduction in both rate dispersion and the price-related differential (Paladi, 2024). The data are presented in Table 5.

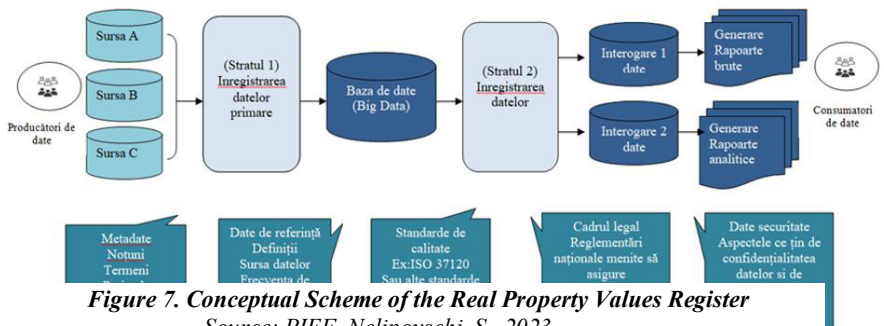
**Table 5. Comparison of Quality Indicators for Legacy and Updated Models (Example: Apartments in Multi-Storey Buildings and Urban Houses)**

Indicator	Recommended Value	Apartments in Multi-Storey Buildings			Urban Single-Family Houses		
		old	new	R	old	new	R
Num.		1710			7693		
Median ratio (Med)	0,9-1,10	0,41	1,03	↑56%	0,24	1,03	↑73%
Coefficient of Dispersion (COD), %	5-20%	108,26 %	37,28 %	↑70,98 %	128,32 %	42,45 %	↑85,87 %
Price-Related Differentia 1 (PRD)	1,0	1,78	1,19	↑59%	1,69	1,28	↑41%

Sursa: elaborat de autor.

The results presented in Table 5 highlight a significant improvement in the quality of the applied models as a result of implementing the methodology proposed in this dissertation. Although certain indicator values do not always fall within the recommended thresholds, these deviations can be further reduced through the use of more accurate and better-structured datasets.

An original contribution of the author consists in the development of the concept of the National Register of Prices and Values (NRPV), designed as a public-interest information instrument with differentiated access, intended to collect and provide historical data series necessary for the calibration of valuation models, as well as for the generation of value maps to enhance transparency. The register is designed to store metadata regarding the source of each observation, the transformations applied, and the validation rules used. The concept of the NRPV is illustrated in Figure 7.



**Figure 7. Conceptual Scheme of the Real Property Values Register**

Source: PIEF, Nelipovschi, S., 2023.

A procedure for periodic recalibration is proposed, whereby new transactions feed the Register and trigger incremental revisions of the valuation models. Alert thresholds for quality degradation and mechanisms for methodological approval are established. The use of a rolling data window of 24–36 months is recommended, together with the application of temporal weighting rules.

With regard to institutional infrastructure, the dissertation proposes a structure with clear data governance, defining explicit roles and responsibilities for the methodological authority, data operators, and local administrations. The implementation of internal and external audit processes is recommended, along with the maintenance of decision logs, ensuring version traceability, and the periodic publication of quality reports.

Institutional feasibility is ensured through alignment with the recent regulatory framework, which recognizes the need for modern instruments for mass appraisal. The study proposes a set of legislative amendments and operational procedures that can be implemented gradually, starting with pilot localities and progressively expanding to the national level following impact assessment.

Methodological limitations and future development directions are also discussed, including the integration of spatial effects through geographically weighted regression (GWR), non-linear modeling using splines, and the application of machine learning techniques as auxiliary, explainable, and complementary tools to traditional models (Anselin, 1988).

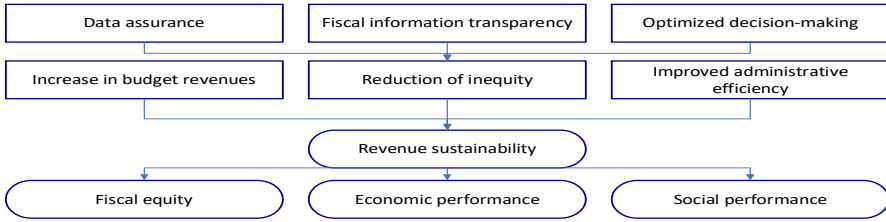
The content of the dissertation reflects the coherence of the research approach, from conceptual and legal foundations to econometric modeling and institutional design. The hypothesis formulated in the introduction is confirmed by the empirical results: log-linear hedonic models, supplied with data from the National Register of Prices and Values, provide reference values that meet international quality standards and contribute to strengthening fiscal equity. Moreover, the integration of monitoring procedures and appeal mechanisms enhances public trust in the system.

At the practical level, the dissertation proposes a roadmap for the modernization of mass appraisal in the Republic of Moldova. Methodological recommendations—covering model specifications, data structures, and quality indicators—are complemented by institutional recommendations on governance, operational processes, and transparency, thereby creating the prerequisites for a sustainable system. The added value is reflected both in increased administrative efficiency and in the improved quality of public policy decisions. The interaction between beneficiary stakeholders and impact channels is illustrated in Figure 8.

Looking ahead, several directions for further development are identified: extending advanced modeling methodologies to non-residential segments, integrating spatial effects and neighborhood quality indicators, and exploring the role of valuation models in supporting public administration. These directions are consistent with the principles of transparency and accountability advanced in the dissertation and may



accelerate convergence with international best practices (World Bank, 2020; IVSC, 2017). The conceptual map of benefits is schematically presented in Figure 8.



**Figure 8. Conceptual Map of Benefits and Impact Channels**

*Source: elaborated by the author.*

According to the research findings, as summarized in the framework shown in Figure 8, the benefits of the proposed methodological and institutional development of the real property mass appraisal system go beyond a mere increase in budget revenues. They also encompass broader social welfare effects, including the reduction of inequities and the enhancement of administrative efficiency at the local level.

## CONCLUSIONS AND RECOMMENDATIONS

### General Conclusions

#### 1. Achievement of objectives and validation of hypotheses

The research confirms the full achievement of the proposed objectives and the validity of the formulated hypotheses, demonstrating the coherence of the scientific approach and the relevance of the proposed solutions for the development of the mass appraisal system of real estate.

#### 2. Strategic role of mass appraisal

The analysis of theoretical foundations highlights the essential role of mass appraisal in ensuring fiscal equity, improving public revenue collection, and modernizing local administration. At the same time, insufficient integration of classical valuation principles (synergy, diminishing returns, highest and best use) within the current methodological framework in the Republic of Moldova is identified.

#### 3. Gaps compared to international practices

The comparative analysis of international experience and national practice reveals significant methodological and institutional gaps, reflected in fragmented information systems, lack of database interoperability, and insufficient human and technological resources.

#### 4. Structural deficiencies of the national system

The research identifies major dysfunctions, including the lack of adaptation of models to real market data, the absence of a unified value register, and unclear institutional responsibilities. These deficiencies affect valuation accuracy, generate fiscal inequalities, and lead to significant public budget losses.

#### 5. Validation of proposed methodological solutions

The development and testing of two log-linear hedonic models for residential real estate demonstrate a significant improvement in estimation accuracy compared to the existing system. Performance indicators confirm increased predictability and model quality, validating their applicability in automated mass appraisal. The results, supported by comparative testing and institutional recommendations, confirm the validity of the research hypotheses and emphasize the importance of implementing the proposed solutions.

#### **6. Impact of system dysfunctions on performance**

The analyzed practical examples highlight the negative impact of institutional dysfunctions on system performance, reflected in substantial financial losses, low levels of expertise, and the absence of a shared strategic vision among institutions.

#### **7. Necessity of institutional and methodological reforms**

The research findings justify the need for systemic reforms aimed at strengthening the institutional framework, modernizing methodologies, and developing information infrastructure to increase system efficiency and transparency.

#### **8. Substantiation of system development solutions**

Concrete proposals are formulated regarding strengthening the role of local public authorities, establishing a central coordinating structure, developing an integrated information platform, elaborating methodologies for unregistered properties, and optimizing appeal procedures.

#### **9. Institutional development model**

A model for the evolution of the mass appraisal system is proposed, involving the participation of the private sector in operational activities while maintaining the state's role in regulation, coordination, and quality control.

#### **10. Theoretical and practical contribution of the research**

The obtained results provide a solid basis for legislative and administrative reforms, contributing both to the theoretical development of real estate valuation and to the practical implementation of solutions within public policies.

#### **11. Impact on sustainable system development**

The implementation of the proposed solutions will lead to reduced budget losses, increased fiscal equity, and the strengthening of the mass appraisal system as a key instrument supporting economic performance and the sustainable development of the Republic of Moldova.

### **RECOMMENDATIONS**

Accordingly, the following practical recommendations are formulated and addressed to the relevant institutions:

#### **To the Government of the Republic of Moldova, the Ministry of Finance, Local Authorities, and the Private Sector**

##### *Optimization of the Legal and Institutional Framework*

- **Standardization of the mass appraisal methodology** through its incorporation into clear and enforceable normative acts that explicitly define calculation

principles, statistical models, and procedures for updating values. It is recommended to introduce a transparent and accessible appeal procedure for appraisal results, enabling property owners and local authorities to benefit from equitable mechanisms for reviewing and correcting potential errors.

- **Demonopolization of mass appraisal services** in order to create a competitive environment that stimulates innovation, improves service quality, and reduces costs for the national budget.

- **Amendments to fiscal policy regarding the taxation of real estate transactions.** The core of this recommendation consists in shifting the calculation of state fees for real estate transactions to be based on values estimated through the mass appraisal system, rather than on declared prices or accounting values. This measure would eliminate dumping practices manifested through the underreporting or concealment of actual transaction prices, thereby enhancing fiscal transparency and fairness. By applying this mechanism, the valuation system would gain access to real market data integrated directly into the legal documentation of transactions, allowing estimated values to be adjusted closer to actual market values. Furthermore, this approach would ensure a more accurate alignment between the tax base and economic reality, reducing discrepancies and disputes caused by artificial underestimation of property values. In the long term, the implementation of this policy is expected to contribute to increased fiscal revenues, strengthened trust in public institutions, and the development of a more equitable and predictable real estate market.

**To the Agency for Geodesy, Cartography and Cadastre, Local Public Administrations, and the Academic Community**

*Development and Implementation of an Advanced Mass Appraisal Methodology*

- **Enhancement of the methodological framework** through the integration of log-linear models with advanced statistical techniques, complemented by empirical adjustments based on the practical experience of valuers. The application of modern techniques for inter-factor regression, model testing, and calibration is aimed at increasing the precision and overall quality of valuation results.

- **Use of the ratio study technique** as a tool for monitoring real estate market trends, providing more accurate and efficient results than the averaging methods currently applied.

- **Updating the classification system for real property objects** to ensure that categories and differentiation criteria more accurately reflect market realities and the typological diversity of properties, thereby supporting more equitable and scientifically grounded valuations.

*Establishment of the Register of Prices and Values*

- **Creation of an integrated national system** to centralize a unified database of real property prices and values.

- **Unification of cadastral, fiscal, and transaction data** into a single database subject to continuous updating.

- **Implementation of modern technologies and statistical analyses** to ensure the quality, accuracy, and transparency of the information used in mass appraisal.

## To Universities, Research Institutions, and Central and Local Public Administrations

### *Professional Training and Partnerships*

- **Updating university programs and specialized curricula** to incorporate new mass appraisal methodologies and data-processing technologies; organizing periodic training for domain specialists; and establishing shared platforms for continuous professional development.
- **Development of partnerships between academia, public administrations, and the private sector** through workshops, seminars, and applied research programs, in order to facilitate the exchange of best practices and the integration of scientific results into practical activities.

### **Anticipated Global Impact**

The adoption of these recommendations will transform the national system of real property mass appraisal into a modern, sustainable, and competitive mechanism capable of supporting the economic development of the Republic of Moldova and ensuring fair and transparent property taxation. The expected impact can be systematized across the following domains:

- **Fiscal:** more stable local revenues, an equitable tax base, and reduced valuation costs.
- **Economic:** a more predictable real estate market, increased investment activity, and enhanced access to credit secured by accurately assessed property values.
- **Social:** greater transparency and increased trust in public institutions, along with broader participation of the private sector and the academic community.
- **Technological:** accelerated digitalization of the cadastre and fiscal processes, and the adoption of advanced technologies and modern data analytics.

These innovations will enhance the effectiveness of fiscal policies through more rigorous tax administration and optimized financial resource management at the level of local public administrations. The implementation of the proposed methodology represents a crucial step in modernizing the national mass appraisal system, contributing to more efficient management of real property assets and to increased market transparency.

The proposals related to the regulatory framework, appeal procedures, and fiscal policy will improve the quality of market data and the accuracy of valuation outcomes. The application of the legislative and institutional recommendations will strengthen operational processes and raise the performance level of valuation models, thereby contributing to the sustainable development of the mass appraisal domain.

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**Paladi Alexandru: "Dezvoltarea cadrului metodologic și instituțional al evaluării masive a bunurilor imobile în Republica Moldova", teză de doctor în economie, specialitatea: 521.03 – Economie și management în domeniul de activitate, Chișinău, 2026**

**Structura tezei:** introducere, adnotare în trei limbi, trei capitole, concluzii cu recomandări, 15 figuri, 11 tabele, bibliografie cu 149 de titluri, 9 anexe.

**Cuvinte-cheie:** bun imobil, evaluare masivă a bunurilor imobile, impozit imobiliar, model de evaluare, regresie matematică, cadru metodologic, cadru instituțional.

**Scopul lucrării:** dezvoltarea unui cadru metodologic și instituțional modern, eficient și transparent pentru evaluarea masivă a bunurilor imobile în Republica Moldova prin elaborarea unor modele statistice performante și prin consolidarea capacităților instituționale necesare implementării acestora.

**Obiectivele cercetării:** analiza fundamentelor teoretice și a conceptelor evaluării masive a bunurilor imobile; investigarea experienței internaționale și a practicii naționale în domeniul evaluării masive a bunurilor imobile; identificarea deficiențelor metodologice, organizaționale și legislative existente în sistemul actual; elaborarea și testarea modelelor hedonice log-liniare destinate evaluării bunurilor imobile rezidențiale; propunerea soluțiilor pentru restructurarea cadrului instituțional și pentru îmbunătățirea sistemului de colectare și utilizare a datelor de piață; formularea recomandărilor practice privind implementarea unui sistem durabil, eficient și transparent de evaluare masivă a bunurilor imobile a bunurilor imobile.

**Noutatea științifică:** definirea și sistematizarea conceptuală a evaluării masive ca proces distinct în cadrul evaluării bunurilor imobile diferențiat prin scopuri, volum, metode și grad de automatizare în raport cu evaluarea individuală tradițională; elaborarea unui cadru teoretic și normativ comparativ bazat pe analiza practicilor internaționale, adaptat la realitățile instituționale și legislative din Republica Moldova, evidențind lacunele existente și direcțiile de aliniere; argumentarea necesității reformării sistemului actual de evaluare imobiliară din Republica Moldova prin integrarea unei metodologii unitare, transparente și replicabile fundamentate pe indicatori relevanți și baze de date interoperabile; dezvoltarea și testarea modelelor matematico-statistice (regresie multiplă) pentru evaluarea bunurilor imobile rezidențiale aplicate pe date reale, demonstrând fezabilitatea evaluării automate în condiții locale; formularea unui set de recomandări metodologice și instituționale cu valoare aplicativă pentru organizarea unui sistem național unificat de evaluare masivă a bunurilor imobile, sustenabil, capabil să susțină fundamentarea echitabilă a impozitului funciar și pe bunurile imobile.

**Ipotezele lucrării:** 1) perfecționarea metodologiei de evaluare masivă a bunurilor imobile a bunurilor imobile prin aplicarea modelelor hedonice log-liniare va crește acuratețea valorilor estimate, sporind echitatea și transparența în impozitarea imobiliară; 2) consolidarea cadrului instituțional al evaluării masive prin dezvoltarea capacităților statului și ale autorităților publice locale (APL) va susține durabilitatea sistemului, reducând impactul socioeconomic generat de lipsa de dezvoltare și stagnarea proceselor existente.

**Rezultatul obținut:** fundamentarea rolului și importanței sistemului de evaluare masivă a bunurilor imobile în cadrul obiectivelor sistemului de impozitare ad-valorem; analiza detaliată a practicii internaționale și a specificului sistemului național de evaluare masivă a bunurilor imobile; identificarea principalelor probleme existente și formularea propunerilor concrete pentru soluționarea acestora; evaluarea eficienței propunerilor promovate prin aplicarea lor pe exemple practice și cazuri reale.

**Semnificația teoretică:** constă în formularea și înaintarea recomandărilor fundamentate teoretic pentru implementarea modificărilor propuse în practica sistemului de evaluare masivă a bunurilor imobile a bunurilor imobile și pentru aplicarea acestora în contextul repartizării obligațiilor fiscale. Un aspect distinct al lucrării îl reprezintă crearea unei baze teoretice solide pentru cercetările viitoare în domeniul evaluării și impozitării imobiliare.

**Valoarea aplicativă a tezei:** constă în posibilitatea utilizării practice a conceptelor și metodelor dezvoltate pentru evaluarea sau reevaluarea masivă a bunurilor imobile de diferite categorii în scopuri



fiscale. Aceasta derivă atât din analiza și sinteza materialelor existente prezentate în teză, cât și din contribuția proprie a autorului, care pot fi aplicate de către instituțiile de profil, precum și în cercetările științifice ulterioare în domeniul evaluării imobiliare.

**Implementarea rezultatelor științifice:** segmentele metodologice dezvoltate în această lucrare au fost deja aplicate practic în elaborarea și perfecționarea modelelor de evaluare masivă a bunurilor imobile în cadrul implementării Proiectului de Înregistrare și Evaluare Funciară (PIEF).

## АННОТАЦИЯ

Палади Александру: «Развитие методологии и институциональных основ массовой оценки недвижимости в Республике Молдова», диссертация по экономике, специализация:

521.03 – Экономика и менеджмент в сфере деятельности, Кишинев, 2025

**Структура диссертации:** Введение, аннотация на трёх языках, три главы и заключение с рекомендациями, 15 рисунков, 11 таблиц, список литературы из 150 наименования и 9 приложений.

**Ключевые слова:** недвижимость, массовая оценка, налог на недвижимость, модель оценки, математическая регрессия, методологическая база, институциональная основа.

**Основная цель исследования:** Разработка эффективной методологической и институциональной основы для системы массовой оценки недвижимого имущества в Республике Молдова путём создания строгих оценочных моделей, соответствующих международным стандартам, и укрепления институционального потенциала органов, участвующих в процессе.

**Цель исследования:** анализ теоретических основ и концепций массовой оценки недвижимости; исследование международного опыта и национальной практики в области массовой оценки; выявление существующих методологических и организационных недостатков; разработка и тестирование лог-линейных гедонических моделей для оценки жилых объектов; выработка решений по реструктуризации институциональной базы и улучшению системы рыночных данных; формулирование практических рекомендаций по внедрению устойчивой и прозрачной системы массовой оценки.

**Научная новизна:** определение и концептуализация массовой оценки как самостоятельного процесса в рамках оценки недвижимости, отличающегося по целям, объёму, методам и степени автоматизации; разработка сравнительно-теоретической и нормативной базы, основанной на анализе международной практики и адаптированной к институциональным и законодательным реалиям Республики Молдова, с выявлением существующих пробелов и недостатков; обоснование необходимости реформирования действующей системы оценки недвижимости в Республике Молдова путём интеграции единой, прозрачной и воспроизводимой методологии, основанной на релевантных показателях и взаимодействующих базах данных; разработка и апробация математико-статистических моделей для оценки недвижимости на основе реальной выборки данных, с возможностью автоматизированной оценки в локальных условиях; формулирование набора прикладных методологических и институциональных рекомендаций по организации национальной системы массовой оценки, способной обеспечить справедливое налогообложение недвижимости.

**Рабочие гипотезы:** 1) Совершенствование методологии массовой оценки недвижимости посредством применения лог-линейных гедонических моделей повысит достоверность оценочных значений, способствуя справедливости и прозрачности налогообложения. 2) Совершенствование институциональной базы массовой оценки за счёт укрепления потенциала государства и органов местного

публичного управления обеспечит устойчивое развитие системы массовой оценки и снизит социально-экономические риски, вызванные её стагнацией.

**Полученные результаты.** Обоснование роли и значения системы массовой оценки в рамках целей адвальной налоговой политики; детальный анализ международной практики и специфики национальной системы массовой оценки; выявление основных проблем и разработка предложений по их решению; расчёт эффективности предлагаемых мер на конкретных примерах.

**Теоретическая значимость:** формулировка теоретически обоснованных рекомендаций по внедрению изменений в систему массовой оценки недвижимости, а также подчеркивание значения предложенных изменений в контексте распределения бюджетных обязательств. Особое значение имеет создание в диссертации теоретической базы для дальнейших исследований в области оценки и налогообложения недвижимости.

**Прикладная ценность работы:** состоит в возможности практического использования разработанных концепций и методологии, в рамках текущей массовой оценки/переоценки различных категорий недвижимости для целей налогообложения. Ценность заключается в получении прикладных материалов, которые представлены и проанализированы в диссертации, и могут быть эффективно применены отраслевыми учреждениями, а также для дальнейших научных исследований в данной области.

**Внедрение научных результатов:** Предложенные автором методические элементы уже имеют практическое применение при разработке моделей массовой оценки в рамках реализации Проекта по регистрации и оценки недвижимости.

## ANNOTATION

Paladi Alexandru: "Methodological and Institutional Development the massive evaluation

of real estate in the Republic of Moldova", PhD thesis in economics, specialty: 521.03 Economics and management in the field of activity, Chisinau, 2025

**Thesis structure:** Introduction, annotation in three languages, three chapters and conclusions with recommendations, 15 figures, 11 tables, bibliography of 150 sources, and 9 appendices.

**Keywords:** real estate, mass valuation, property tax, valuation model, mathematical regression, methodological framework, institutional framework.

**Purpose of the thesis:** To develop an effective methodological and institutional framework for the mass valuation system of real estate in the Republic of Moldova, through the elaboration of rigorous valuation models aligned with international standards, and the strengthening of the institutional capacities of the authorities involved in the process.

**Research objectives:** Analysis of the theoretical foundations and concepts of mass valuation of real estate; investigation of international experience and national practice in the field of mass valuation; identification of existing methodological, organizational, and legislative deficiencies; development and testing of log-linear hedonic models for the valuation of residential real estate; proposal of solutions for restructuring the institutional framework and improving the system of market data collection and use; formulation of practical recommendations for implementing a sustainable and transparent mass valuation system.

**Scientific novelty:** Definition and conceptual systematization of mass valuation as a distinct process within real estate valuation, differentiated by purpose, scope, methods, and degree of automation, compared to traditional individual valuation; development of a comparative theoretical and normative framework based on the analysis of international practices, adapted to the institutional and legislative realities of the Republic of Moldova, highlighting existing gaps and directions for alignment; substantiation of the need to reform the current real estate valuation system in the Republic of Moldova through the integration of a unified, transparent, and replicable methodology, based on relevant indicators and interoperable databases; development and testing of mathematical-statistical models (multiple regression) for residential real estate valuation, applied to a real data sample, demonstrating the feasibility of automated valuation under local conditions; formulation of a set of methodological and institutional recommendations, with applied value, regarding the organization of a unified and sustainable national mass valuation system capable of supporting the fair foundation of land and property taxation.

**Research hypotheses:** 1) Improving the methodology of mass valuation of real estate through the application of log-linear hedonic models will enhance the accuracy of estimated values, thereby increasing fairness and transparency in property taxation; 2) Improving the institutional framework of mass valuation by strengthening the institutional capacities of the state and local public authorities in this sector will

contribute to the sustainable development of the mass valuation system and reduce the socio-economic impact generated by the stagnation of its development.

**Results obtained:** Substantiation of the role and importance of the mass valuation system within the objectives of the ad valorem taxation system; detailed analysis of international practice and the specifics of the national mass valuation system; identification of key problems and formulation of proposals for their solution; as well as the calculation of the efficiency of the promoted proposals using concrete examples.

**Theoretical significance:** Consists in formulating theoretically grounded recommendations for implementing the proposed changes in the practical operation of the mass valuation system, as well as in applying these changes in the context of distributing tax liabilities. A distinct aspect is the creation in the thesis of a theoretical basis for further research in the field of real estate valuation and taxation.

**Applied value of the thesis:** Lies in the possibility of practical application of the concepts and methodologies developed within the current works of mass valuation/revaluation of real estate of different categories for fiscal purposes. This results from the materials consulted, presented, and analyzed in the thesis, as well as from the author's own contribution, which can be applied by sectoral institutions as well as in further scientific research in the field.

**Implementation of scientific results:** The methodological segments proposed in this thesis are already being applied in the development of mass valuation models within the implementation of the Land Registration and Valuation Project.

PALADI ALEXANDRU

DOCTORAL THESIS  
DEVELOPMENT OF THE METHODOLOGICAL AND INSTITUTIONAL  
FRAMEWORK  
FOR MASS APPRAISAL OF REAL ESTATE  
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521.03 – ECONOMICS AND MANAGEMENT IN THE FIELD OF ACTIVITY

Abstract of the Doctoral Thesis in Economic Sciences

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