

# The Relationship Between the Land Cadastre and the Mass Valuation System - Mutual Benefits and Challenges

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**Key words:** Property Valuation, Property Cadastre and Register, a Synergistic Link.

## SUMMARY

Mass valuation, requires the development of a valuation model capable of replicating the forces of supply and demand over a large area. Valuation judgments relate to groups of properties rather than to single properties. Property characteristic and sales data are used in the valuation system to conduct analysis and to generate values. Data collection and maintenance are the most expensive aspects of most mass valuation systems.

Lithuania's practice of mass valuation and the multipurpose use of its results, allows to discern synergistic relationship between the modern cadastre and mass valuation systems. Their interplay expands the usability of mass valuation results, encourages feedback, as a result of which land cadastre benefits itself and, last but not least, reduces both systems development and maintenance costs.

The paper analyzes Lithuania's experience in the development of land register, cadastre and mass valuation systems and their further interaction in the modern environment. A relationship between the two systems, which can be described as a synergistic link, and the prospects for further development, is presented.

## SUMMARY (in Lithuanian)

Masiniam vertinimui, reikia naudoti vertinimo modelį, atspindintį pasiūlos ir paklausos santykį didelėse teritorijose. Šiuo atveju vertinimo sprendimai susiję su nekilnojamojo turto grupėmis, o ne su atskirais turto objektais. Duomenys apie nekilnojamojo turto charakteristikas ir pardavimus naudojami vertinimo sistemoje siekiant atlikti analizę ir nustatyti vertes. Duomenų rinkimas ir palaikymas yra brangiausi aspektai daugumai masinio vertinimo sistemų.

Lietuvos praktika masinio vertinimo ir daugiataklis rezultatų panaudojimas, leidžia išvelgti sinergetinį ryšį tarp šiuolaikinio kadastro ir masinio vertinimo sistemų. Jų sąveika plečia masinio vertinimo rezultatų platesnį naudojimą, skatina grįžtamąjį ryšį, kurio dėka tobulėja kadastras ir mažėja abiejų sistemų plėtros ir palaikymo kaštai.

Straipsnyje analizuojama Lietuvos patirtis kuriant žemės registro, kadastro ir masinio vertinimo sistemas ir jų tolesnė sąveika šiuolaikinėje aplinkoje. Aprašomi santykiai tarp dviejų sistemų, kurias galima apibūdinti kaip sinergetinį ryšį, ir jų tolimesnė plėtra.

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## 1. INTRODUCTION

Land administration, cadastre, "titling" and land valuation projects are major concerns in many countries given the underlying economic and social stakes. The transition countries of the Europe and Central Asia regions (ECA), since 1990 experienced substantial changes in political, economic and social spheres. Land and other real estate privatization, effective asset management development and incorporation in the credit market has become the key elements of the reforms. Supported by the World Bank, other international institutions and developed countries, as well as due to efforts of national governments, the countries of the region implemented projects on land reform, land administration, and land management. (Törhönen, 2016). Most of the projects have included land registration activities, which was one of the most important preconditions for conversion of land cadaster, responding to the provisions laid down in *CADASTRE 2014*.

Current development stage is focused on the further modernization of land administration system applying new technologies and creating more effective systems. The created basis enables to take on the land tax reform, the core of which is the land mass valuation.

A mass valuation system must have an inventory of all properties, their uses and their physical and locational characteristics. Collecting and maintaining information about land and buildings can be the most expensive facet of taxing immovable property. The investment in making this inventory can be 75 per cent of the cost of valuation. (Gloude-mans, 1999) Accordingly the assembly and maintenance of property attribute data on use, location, size, and other features of land plots and buildings by traditional field inspection methods has been a major obstacle to the introduction of new value-based immovable property taxes and to revaluations.

Looking for the ways to make data collection and maintenance cost-effective the various solutions are possible. The Guidance on International Mass Appraisal and Related Tax Policy recommends one way to increase the return on investments in valuation systems and cadastral databases is to use the data in multiple ways. The values developed for property taxation can be used for a variety of purposes.(IAAO,2013) Lithuania's practice of mass valuation and the multipurpose use of its results, allows to discern synergistic relationship between the modern cadastre and mass valuation systems. Their interplay expands the usability of mass valuation results, encourages feedback, as a result of which land cadastre benefits itself and, last but not least, reduces both systems development and maintenance costs. World Bank conference in Vilnius, in 2015, widely considered Lithuanian experience and formulated conclusions, which confirmed that our actions and decisions are logical and leading to the best result, and are obviated by the problems faced by countries without integrated real estate management systems.

## 2. LOOKING FOR COST-EFFECTIVE VALUATION SYSTEM

The driving force for the development of mass valuation methods has been immovable property taxation. In recent years, mass valuation methods and data also have been used for general information purposes, by public sector and private companies in the real estate industry. The modern mass valuation relies on computers and statistical analysis. Mass valuation system generally comprises sub-systems and procedures for:

- Collecting and maintaining data on properties and their attributes;
- Collecting market evidence (sales prices, rents, etc.);
- Market analysis (trends in prices across time and among locations and types of properties);
- Developing and applying mass valuation models;
- Evaluating value accuracy (ratio studies) of current and proposed values;
- Communicating values to tax authorities, taxpayers, and other stakeholders;
- Responding to appeals and other objections about values. (Almy, 2014)
- It is estimated, that total annual expenditures for property tax administration generally are in the range of 5 to 10 per cent of annual property tax revenues in developed countries. Although the costs and effectiveness of valuation systems seem little studied, valuation costs can be as low as 1 to 2 per cent in high property tax countries like the United Kingdom and the United States. It was also found that, low-tax systems need to be less ambitious. (Almy, 2014)

Whatever the level of taxation, the costs of valuation need to be kept to a small percentage of the revenues raised from the property tax.

As it was mentioned, three-quarters of the assessment costs are allocated for data collection and maintenance. In order to reduce the overall mass valuation system operation costs, it is necessary to look for ways how to collect and use the data more effectively. Various sources recommend ways to make data collection and maintenance cost-effective, which are used in different countries and jurisdictions. In the first place, valuers can often be more judicious in determining which data elements are needed in valuation. For instance, direct comparison models typically require fewer data elements than models based on construction costs. Second, field data entry can now be automated, reducing the need to write down data and then have them transcribed. Well-designed taxpayer declarations, can also reduce or eliminate the need to inspect properties in the field. Finally, aerial imagery and other techniques can be used to detect un-assessed properties and new construction. They also are used to supplement or confirm information obtain in other ways.

The above listed techniques are mainly associated with the valuation for property tax . The recommendation of the International Guidance to use the data and values in multiple ways goes beyond the limits of the assessment for property tax. Lithuania's practice of mass valuation and the multipurpose use of its results corresponds to the recommendation of the International Guidance. The multipurpose real property cadastre and mass valuation system, which is implemented in the country, plays an important role by providing adequate tax platform and the use of mass valuation results for other public needs.

### 3. CADATRE AND REGISTER VERSUS DATA COLLECTION

The effectiveness of the Lithuanian mass valuation system is ensured by the appropriate choice real estate administration system. All real property and its transactions in Lithuania are registered in the digital Central Real Property Cadastre and Register Database. The real property registered in the Real Property Register is described following the valid legal acts and the dates are properly verified and reliable. Property identification is unified and the system for searching property description becomes simpler.

Trying to achieve better results with less resources, the mass appraisal system was built on the integrated digital data of real property cadastre and register. In this way, data collection has become the function of surveyors which are surveying newly formatted real estate units or updating the information when some changes of property unit characteristics are occurred. Surveyor's activities, as well as the structure of the real estate cadastre information are defined by the legal acts. The data on physical characteristics of the property and the sales data are collected, stored and updated in the cadastre and register and used by valuers.

Interaction between the cadastre and register usually depends on the real property administration traditions in a certain country. In Lithuania, the cadastre is closely linked with the real property register. The cadastre supplies reliable qualitative and quantitative data about land and other real property to the register that is very important for legalisation of ownership rights to property, conclusion of real property transactions and solution of disputes related to property. With successful integration of the real property cadastre and register, Lithuania managed to establish a multi-purpose cadastre and register system that contributes to the improvement of protection of ownership rights, to the development of real property administration, to the promotion of economic development in the country. The progress achieved in a relatively short time, i.e. just within ten years.

Creation of legal framework regulating the real property administration started in 1992. Following the analysis of the experience of different countries, it was decided to develop such a legal framework that enabled the creation of a unified real property register and cadastre which could have been constantly improved taking into account the public needs.

In 1997, the registration of land and buildings and rights thereto was merged and the Real Property Register started its operation. At the beginning of the cadastral system development, the main focus was on real property accounting/statistics and protection of owners' rights. Gradually more attention was given to the cadastre systems and sub-systems (such as real property mass valuation system based on market value).

Presently the base registers kept by the Centre of Registers are (1) the real property register and cadastre, (2) the register of legal entities– established in 2004, it holds standard legal forms related to legal persons, (3) the address register– established in 2004, it contains 1.9 million addresses (of which 0.9 million are address points and 1 million are addresses of premises) and (4) the population register–established in 1992 and maintained by the Center of Registers since October 2014. In recent years, the registers are integrated and data accessibility and utilization.

The data cadastral textual (data identifying a property object, qualitative and quantitative characteristics of property unit, main purpose of use, etc.), graphical (boundaries of the registered property objects, their location and position, boundaries of the administrative units, market value zones) and register data (owners and users, real rights, restrictions and legal facts) are stored in real estate cadastre and register.

Starting from 2002, clients can order services and works online. That enabled residents and businesses to save time, avoid travelling and queuing. Seeking to save clients' time and money to a greater extent, the Centre of Registers implements various projects related to the transfer of public services to the electronic environment; it creates and constantly improves e-services; develops e-document archive, actively cooperates with other countries on register integration and modernisation, data security, implementation of onestop-shop principle and other relevant issues. In 2009, the project "Public Electronic Service for Real Property Transactions (NETSVEP)" was implemented. It introduced the real property e-conveyance system in Lithuania. The purpose of this project was to enable clients to conclude real property transactions within a shorter period of time by performing all actions related to real property acquisition and registration of rights thereto at the notary bureau without direct visits to the Centre of Registers. The Center of Registers receives sales data for mass appraisal purposes from the Information System NETSVEP (Public Electronic Service for Real Property Transactions) which is integrated into the IT infrastructure of the Center of Registers. Due to that counterparties have to communicate only with a notary and have no need to submit any documents or data directly to the Center of Registers as all transaction documents are signed with electronic signature and automatically transferred to the Center of Registers in a digital form. Electronic documents and information are entered in NETSVEP and checked only once, what minimize a possibility of errors.

The real property cadastre and register system in Lithuania is centralised, i.e. only the data stored in the central databank have legal status, digital, i.e. cadastral data and legal information covers the entire country, and only digital data have legal effect (excerpts from the central database), information services are delivered interactively (e-services), etransaction system is being implemented, multi-purpose, i.e. is used for protection of ownership, taxation, valuation, market services, operates on a cost recovery principle, i.e. costs are covered from the income generated from the services provided.

On the whole, an effective system for registration of real rights, property values and use is the foundation for efficient operation of the market economy, promotion of good governance and sustainable development in the country. A multi-purpose cadastre and register system creates new opportunities to add value to the real property data and use them not only on the national but also on the international level.

#### **4. MASS VALUATION**

Mass valuation system, fully managed by the Center of Registers, consists of four traditional subsystems: (1) data collection and management; (2) data analysis; (3) value computation; and (4) methodical – administrative. It's worth to remind that data collection is not a function of valuers, unless specific market data is collected. The mass appraisal process based on the

digital data of real property cadaster and register, is fully automated itself, data is publicly available, including the website of the Center of Register and REGIA portal. Integrated digital data used for mass valuation, are based on the following key characteristics: physical characteristics of immovable things, GIS (Geographic Information Systems) information, archive of e-documents and finally data about legal status of immovable thing, owners and users, real rights, their restrictions and legal facts.

Real estate transactional data, along with a copy of the sale contract in on-line mode are passed to the Centre of Registers within 24 hours after the transaction. This way is obtained sales evidence information across the country. Data on market transactions are integrated to real property database. The availability of digital database covering physical and legal characteristics of the property and up to date market information allows an application of CAMA system. Increasing use of statistical methods for the selection and processing of data reduces the potential of mistakes and random factors making influence on value. Currently there are more than 6 millions property units registered in Real property database, and more than 2 millions of them are land parcels. Within one year more than 100,000 real property transactions are concluded, which form the basis of the transactions database (integral part of overall database) used for market analysis and mass appraisal.

In an each stage of mass appraisal process, the special mathematical - statistical methods are used for the processing of specialized data and applications. Currently, the overall appraisal process is carried out with statistical NCSS (Number Cruncher Statistical Software) program. Over 5,5 million units of properties (2,2 million land parcels and 3,3 million buildings and premises) are assessed annually by using CAMA system. Taking into regard the multipurpose usage of mass appraisal results, all real property (land and buildings) is assessed annually, regardless of whether the property is a subject to taxes or not. The obligation to the Center of Registers to prepare 122 appraisal reports and to draw up value maps on annual basis is established in the legal acts of Lithuania.

Results of mass appraisal are used for different purposes. First and one of the most important one is the estimation of taxable values of land and buildings (two separate taxes). Other purposes for which the mass appraisal results are used: to make decisions on provision of social support and state guaranteed legal assistance for citizens, estimation of sales and rental values of the state-owned land parcels and buildings, estimation of inherited property taxable value, for calculation of fees for registration of real property and rights to it, for estimation of notary fees for real property transactions. It's important to mention that taxable values, calculated by using mass appraisal results, are legitimate for 5 years, and the market values Center of Registers calculate each year.

As it was mentioned, the results of mass appraisal are publicly available. Taxable values, market values and other mass appraisal documents can be found on the following websites: [www.registrucentras.lt](http://www.registrucentras.lt) (the main website of the Centre of Registers) and [www.regia.lt](http://www.regia.lt) (the website of the Regional Geo-information Environment Service (REGIA)). It should be noted that free of charge are textual data, e.g. the average market value or taxable value by unique number, the search for value zones by municipalities and addresses, mass valuation documents, materials of public discussions and graphical data, e.g. value maps of the territory

of Lithuania and graphical search for value zones (through the Address Register). Center of Registers also offers services of data for the fees: e.g. data for the registered users and self-services of the real property register

## 5. MUTUAL BENEFITS OF TWO SYSTEMS

The original objectives of the real estate cadastre and registre development have been associated with the asset accounting, protection of property rights and so on. When cadastre and registry system has been modernized and fully computerized, it turned out that it can serve as the sound basis for the development of mass valuation system. A cross-integrated cadastral and mass valuation systems create a synergistic link. One can name the threefold effect of such a link:

- **Mass valuation benefits from cadastre and register.** The database of cadastre and register provides data on the characteristics of the property, the legal facts as well as sales data. It allows to save three quarters of financial resources and to direct human and technical resources for data analysis and assessment. Resources assigned to the collection of data in any case are used for the cadastre formation, regardless of whether it will be done mass valuation or not. Another important aspect is the fact that the database contains more information about the properties than that of need for mass valuation. When changing conditions or technologies in the valuation of properties such reserve of data may be used at any time during the valuation.
- **Cadastre and registre benefits from mass valuation.** The real estate cadastre, was started to transform from the Soviet type cadastre, and still is currently being modernized. Use of data for mass valuation allows to highlight the data sets that are necessary and so helps to optimize the whole structure of cadastre and register. Mass valuation complements the cadastral system with values, the values zones, and other attributes that enrich the data base and provide more information to consumers.
- **Mutual benefits.** Integration of mass valuation system with the cadaster and register creates preconditions for more effective submission of informatikon to consumers. General real estate register excerpts might be supplemented with information about values or vice versa - values may be provided along with some property characteristics. Administration and integration of several registers allows consumers to choose various ways of access to information - such as the use of personal data, address, property ID, and other parameters. There are developed three levels of the provision of the information via Internet (1) for public (anonymous users), free of charge but minimum information provided; HTML format only („for interactive usage“), (2) for professional users - complete information; available both in HTML/XML format; different authentication methods available („username + password“ / certificates), (3) self-service - complete information about their own property; limited information about any property (in the near future). Interactive authentication via ipasas.lt

One of the latest examples of the use of IT solutions is the regional environment geoinformation service (REGIA), based on the cadastral map of Lithuania, with its

built-in three state registers: Address, Legal Entities and Real Property, data. REGIA is a tool specifically developed for municipalities: their citizens, civil servants and therein operating businesses. Working in the service environment, the REGIA users can create and manage their own data layers. No additional software or hardware is required - all services are managed through the web browser. REGIA operates on the cloud principle: all information created by a user, data recorded, uploaded documents are accumulated and stored in the REGIA servers and are accessible from any computer. Within its managed data layer, the administrator can store and manage own data, information or documents, create and provide services based on geo-referenced data.

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## BIOGRAPHICAL NOTES

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