



# Rating engineering of real estate markets as the condition of urban areas assessment



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## ABSTRACT

The real estate market is closely linked with the condition of the area (e.g.: quality of both technical and social infrastructure, function of urban area – residential, commercial, industrial, recreational; characteristics and state of the environment, spatial barriers and obstacles, etc.) and it is determined by the diverse needs and requirements of space users. Cities and regions which want to achieve a dominant position in the network via their policy try to attract as many entities and types of activity as possible. The link between real estate markets and the potential of urban development is becoming increasingly visible and highlighted in many studies. Real estate markets play an increasingly important role in the global economy and attract a growing number of international investors. Consequently, the demand for reliable classification and scoring systems will continue to grow and become an essential tool in the process of investment planning.

The aim of this research is to develop a methodology which could be used to evaluate the state (related to rating levels such as: investment, development, stagnant, crisis; see [Appendix A, Table A1](#)) and the condition (related to the components described in the rating scale table, such as: economic situation, quality of life, spatial potential of development, flexible reaction of the market, behavioral factors, etc.; see [Appendix A, Table A1](#)) of the real estate market in a form of rating. The established rating classification provides a current, reliable and comparable view of the conditions of cities that can be useful in investment decision-making process. The authors used “Rating Engineering” to highlight the application of mathematics and practical knowledge (regarding the needs of participants) in order to develop an innovative tool for decision-making on the real estate market. The proposed rating system procedure is versatile and can be implemented in any domain, especially when the analysis concerns imprecise and vague data. The study shows that the ratings developed by the authors indicate on a significant correlation with future events in the real estate market, which have a key influence on the development of the real estate market and an assessment of its condition. The received results confirmed that the developed methodology allows to obtain reliable view of the state and condition of residential property market.

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## 1. Introduction

Real estate is the kind of goods that depends, among other things, on the place where they are located. Real estate, especially residential properties, is according to the needs hierarchy of Abraham Maslow, one of the most important factors which meets the basic biological needs of a man (Kotler et al., 1993). In the hierarchy

of the importance of needs, the need for housing takes one of the main places. Real estate is an integral and indispensable element of meeting needs virtually in every sphere of human life: in the sphere of security needs (sense of stability), social needs (home, meeting place), needs for recognition and respect (a sign of prestige, high-lighting social position), and the need for self-realization (proof of independence).

Fulfilling a number of functions related to meeting human needs, real estate provides timely, important, and even necessary area for an interdisciplinary research. From this point of view, the real estate market should be the subject of studies that not only take into account the impact on the value of the so-called physical

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aspects of real estate in the micro-local conditions, but it should also be studied in terms of macroeconomic and global aspects, in relation to the information strictly linked to the market and the factors that define the quality of the space in which they are located. This widely recognized range of information allows diagnosis of the quality of life of a given society regarding the economics, political, social and behavioral terms in their micro-, macro- and global aspects.

Decision-making on the real estate market is complicated from the point of view of the needs that the property is supposed to satisfy. The difficulty also lies in the diversity and imprecision of space attributes, a large and multidimensional scope of data to be analyzed, the sensitivity of properties to environmental or economic changes and fashion, as well as heterogeneity with respect to nature and type of individual objects. All of those aspects increase volatility and in this context they create problems with the reliability and effectiveness of the analyses.

The universality of the topic and its practicality increase the number of scientific studies on real estate markets classification. Most of the analyses focus, however, on the division, classification or segmentation of real estate markets, and not on the assessment of its condition, which is very important in the process of increasing the efficiency of decision-making and the rationalization of decision-making situations for every participants of the real estate market.

Guided by these assumptions, the authors proposed the development of a complementary and unified scoring system that allows for the assessment of residential real estate markets condition. The conducted study should be considered as an important methodical element. The results will enable market participants to make decisions in a more conscious and well organized manner. The access to continuously updated information about the rating may certainly affect the increase of informational efficiency in the decision making process, especially in case of private and public investors, developers, appraisers, tax assessors, urban planners, designers and architects, land administrators, local authorities and other real estate market participants, such as, mortgage lenders and insurers etc. Additionally, the objectified information will be more accessible, which will influence the level of knowledge among market participants, and thus will be helpful in meeting their needs in the sphere of information.

The conducted research is also important from the point of view of assessing the state of urban development (residential aspect) of the spatial settlement units (e.g. cities). Cities and regions want to achieve a dominant position in the network via their policy and try to attract as many entities and types of activity as possible. When examining the structure and the character of the surrounding space, it is possible to determine whether there are attractive prospects, and whether there is a growth potential in the analyzed area. Each property market is closed in a specific and unique space. The ratings (a dynamic assessment of the state of area development) enable the current assessment of individual spatial units and the identification of threats (e.g.: decreasing investor interest, high migration of population, rising unemployment, deteriorating condition of technical and social infrastructure, decreasing quality of life, emergence of spatial and social conflicts, and occurrence of spatial, environmental and legal barriers) in the functioning of these units in the context of their location of the real estate market.

The paper is structured in the following way. First, explanation of the reason to choosing the rating classification are described in Section 2. Section 3 presents methodology of the research and Section 4 presents the procedure of the real estate market rating. Section 5 includes a Discussion and the analysis of the rating results. Section 6 presents Conclusions.

## 2. Related research

In the literature, the real estate market is often (in fact, even mostly) assessed for its value and in order to define the value-creating factors. *A Real Estate Guide (2015)* indicates that “to appraise means the act or process of developing an opinion of value”. Additionally, *A Real Estate Guide (2015)* and *Kaklauskas et al. (2015)* pointed out that the appraisers must be exceptionally careful to accurately assess the true forces affecting value. The authors mentioned above indicate the particular significance of the following factors: utility, size, corner influence, shape, thoroughfare conditions, exposure, plottage or assemblage, topography and character of soil, obsolescence, building restrictions and zones, tract layouts, directional growth (“the city directional growth”), location, environmental, social ideals, character of business climate, economic condition etc. The link between real estate markets and the potential of urban growth was revealed a long time ago (e.g. *D’Arcy and Keogh, 1999; Leung, 2004*). Real estate markets play an increasingly important role in the global economy and attract a growing number of international investors. Consequently, the demand for reliable classification and scoring systems will continue to grow and become an essential tool in the process of investment planning.

The heterogeneity of real estate affects the complexity of the market, the difficulty of its analysis and the credible inference in the decision-making processes. The consideration of the general condition of a spatial unit (the real estate market) is increasingly discussed in theoretical and practical aspects. In order to make the information more comprehensible, various types of classifications and segmentations are used. Market classifications can be divided into two main categories. The first category is related to the markets sharing depending on the subject, object or condition of the property – this is the context used in the process of property valuation (usually in terms of the local market). In this context, specific real estate markets are usually classified on the basis of property type, location, income-producing, potential, typical investors characteristics, typical tenant characteristics, or other attributes recognized by those participating in the exchange of real property (*Razzak, 2015*). For instance, *Dubin and Goodman (1982)* proposed methods for analyzing non-nested submarkets. *Bourassa et al. (2007)* involved spatial dependences in the prediction of house price. *Goetzmann and Spiegel (1997)* examined how neighborhood amenities influence house prices using zip code districts to determine housing submarkets. The idea to identify housing submarket boundaries by developing and estimating the parameters of a hierarchical model for house prices was proposed by *Goodman and Thibodeau (1998)*. Additionally, *Floyd and Allen (2002)* proposed segmentation of real estate markets due to real estate space and the asset of transactions. The second way involves a classification of real estate markets allowing for a mutual review of individual markets, their quantitative and qualitative comparison in terms of hyper-local and/or global approach. In this group the following classifications can be made:

1. ranking classification – excluding the elements of the comparative assessment of the market,
2. rating classification – including the elements of the comparative assessment and the diagnosis of market condition.

The second classification of the market is the subject of this study. Rating allows for an interpretation of the states and it is an attempt to conduct the comparative assessment. The potential and power of classifying the real estate market in the rating form was indicated by *European Property and Market Rating (2003)*, *Research on Property and Market Rating in China based on Basel II (2008)*, *Kalberer (2012)*, *Renigier-Biłozor et al. (2014)*, *Maszczyk (2014)*, *Kaklauskas et al. (2015)*. The *European Property and Market*

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