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

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\textbf{A R T I C L E   I N F O}

\begin{flushleft}
Article history:
Received 7 May 2016
Received in revised form 30 November 2016
Accepted 30 November 2016
\end{flushleft}

\textbf{Keywords:}
Real estate market
Rating system
Urban areas condition
Urban development

\textbf{A B S T R A C T}

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, highlighting 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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http://dx.doi.org/10.1016/j.landusepol.2016.11.040
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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 ana-
alyzed, 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 volatil-
ity 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 increas-
ing 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 devel-
opment of a complementary and unified scoring system that allows
for the assessment of residential real estate markets condition. The
directed study should be considered as an important methodical
element. The results will enable market participants to make deci-
sions in a more conscious and well organized manner. The access
to continuously updated information about the rating may cer-
tainly 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 acces-
sible, 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 pop-
ulation, rising unemployment, deteriorating condition of technical
and social infrastructure, decreasing quality of life, emergence of
spatial and social conflicts, and occurrence of spatial, environment-
ral 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-
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 exception-
ally 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, thorough-
fare conditions, exposure, plotage 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, eco-
nomic 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 increas-
ingly 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 classifi-
cations 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 condi-
tion 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, typi-
cal investors characteristics, typical tenant characteristics, or other
attributes recognized by those participating in the exchange of real
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 deter-
mine housing submarkets. The idea to identify housing submarket
boundaries by developing and estimating the parameters of a hier-
archical model for house prices was proposed by Goodman and
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 compara-
tive 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), Reniger-Bilozor et al. (2014), Maszczyn
(2014), Kaklauskas et al. (2015), The European Property and Market
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