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MANAGEMENT AND VALUATION IN REAL ESTATE CYCLE - A DECADE OF EXPERIENCE

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ABSTRACT

The issues of "real estate management" (REM) and "real estate valuation" (REV) are very important from the perspective of the economic development of any country. This is because they refer to one of the most important factors of production, which is real estate. The article assumes that REV is all the processes that allow for valuation, while REM is all the processes that allow for the management and administration of real estate. Both of these processes were referred to the "real estate market cycle" (REMC) and the "real estate lifecycle" (REL). The article analyzed 365 articles published in the Journal of Real Estate Management and Valuation (REMV) (eISSN: 2300-5289). The article is a review paper and has been prepared as part of a summary of scientific research carried out between 2013 and 2022.

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1. Introduction

1.4. Methodological assumptions

The issues of REMC and REL are interrelated on many levels of meaning and substance. The first issue provides a space of common interactions, while the second is an emanation of the space of individual characteristics. Within REMC and REL, there are a variety of issues that have been and continue to be the subject of much research carried out in the past decade.

Research in the areas of REM and REV is being conducted in many research centers and by many authors from around the world. These authors define the analyzed concepts in different ways (not always divergent). Moreover, the authors structure the scope of both concepts in different ways. These views arise from several premises of varying nature. These premises include, among others:

1. the political system in a country - among the countries which the authors derive from are those with (Zukrowska, 2010): a liberal political system, post-communist political system, East Asian political system, Islamic political system and others,
2. the economic system in a country - the two basic ones are: capitalist and socialist systems,
3. the system of basic education in a country - the implementation of real estate programs at different levels of education (elementary school, secondary school),
4. the system of higher education in a country - the implementation of programs in the real estate area in universities and colleges,
5. freedom in the ability to conduct scientific research in the country,
6. the level of knowledge of real estate.

Since the authors come from many countries on different continents, there is a need to analyze different approaches in defining and structuring the scope of the concepts of REM and REV in the context of REMC and REL. Therefore, the purpose of the article is to review the definition, concepts, scope and structure of the two issues: REM and REV referenced to REMC and REL based on the research of authors of scientific articles published in REMV in the last decade. The main purpose of the article is to present scientific achievements in the area of REM and REV published in

REMV. The article's goal of relating REM and REV to REMC and REL will be achieved by pointing out the phases of REMC and REL in which the analyzed issues are applicable.

The stated goal indicates that the article is an overview. In this article, Chapter 2 defines the scope and subject of the research, provides the sources of the research material along with the time range, and indicates the research method. Chapter 3 prepares a summary of concepts, issues and definitions related to REM, while Chapter 4 deals with REV. Chapter 5 presents the summary and conclusions.

1.2. The real estate management and valuation

"Real estate management" and "real estate valuation" are two of the basic elements of real estate functioning in the socio-economic space. The first is responsible for real estate management processes in all phases of the real estate life cycle. The second is responsible for the processes of determining the value of real estate, preparing financial investment studies using real estate values. As in the first, real estate valuation processes are carried out in all phases of the real estate life cycle.

REM is a multifaceted issue that has undergone changes over the past decade evolving into systemic real estate management. Among the primary issues addressed in REMV are:

- The concept of asset management (Rymarzak & Trojanowski, 2013).
- Real estate management - integrated approach (Muczyński, 2015).
- Real estate management – value, income, return investment (Abdullah et al., 2015).
- Sustainable Corporate Real Estate Management (Ziemba et al., 2015).
- Social housing management (Muczyński, 2016).

REV is a group of issues related to the valuation processes of real estate and its components. Real estate valuation is an issue that changes with changes in the economic environment, which real estate is a part of. Among the main issues that have been addressed in REMV over the past decade are:

- The concept of asset management (Rymarzak & Trojanowski, 2013).
- Real estate management – value, income, return investment (Abdullah et al., 2015).
- Analysis of transaction prices on the real estate market (Maleta, 2013).
- Uncertainty of property valuation (Kucharska-Stasiak, 2013, 2014).
- Property mass valuation (Foryś & Putek-Szeląg, 2018).
- Automated valuation models (AVM) (Chmielewska, et al., 2020).

Both issues with their substantive scope fill, in a fundamental way, the space of the functioning of real estate, regardless of where it is located, what it is, to whom it belongs, what function and role it plays, who invests in it and who trades in it, etc. Both processes are indispensable and necessary regardless of what type of country or economy is being referred to.

1.3. The real estate market cycle

The origins of the term "the real estate market cycle" date back almost a century, when analysts first began to study real estate market trends (Mueller, 1995, 1996). The real estate market cycle is a four-phase series that reports on the state of both commercial and non-commercial real estate markets. The four phases are recovery, expansion, oversupply and recession (Mueller, 1995) (Figs. 1 and 2). The cycle can be used by various real estate professionals to predict the right time to buy, hold or sell. The real estate cycle can provide information on possible gains or losses from real estate. Real estate participants should know whether their properties are in the recovery, expansion, oversupply or recession phases of the real estate cycle. Knowing this allows certain assumptions to be made about when to buy a property, how long a property must be or can be held, and the appropriate exit strategy.

The real estate cycle consists of four main phases (Mueller, 1995, 1996; Pyhrr, et al., 1999; Mueller, 2019-2023) (Figs. 1 and 2):

1. *Recovery* - determining the recovery phase of the cycle can be difficult, as many factors (e.g., the effects of a recession caused by the COVID-19 pandemic, the outbreak of war, the energy crisis) at any given time can affect market processes during this phase. In this phase, rents and real estate prices stagnate or fall, and there are no signs of new investments, including construction. During this phase, real estate investors need to watch closely and react quickly to any signs of recovery. This is a great time for investors to make investment decisions with respect to real estate: e.g. below market value properties that are in various states of financial or physical distress. During this phase, investors should "add value" to properties so that they will be ready to sell or rent when the economy moves into the expansion phase. The key here is timing.

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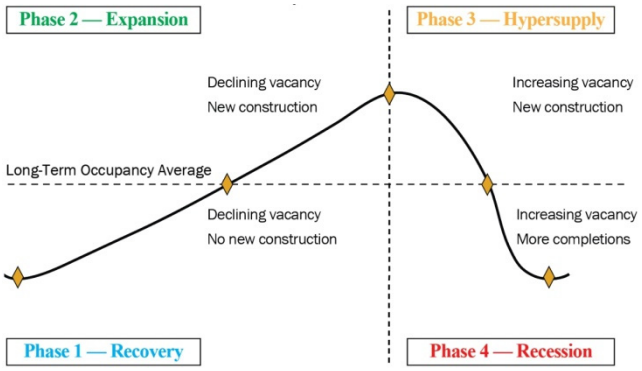


Fig. 1. Real estate cycle - market cycle quadrants. *Source*: Mueller, (1996).

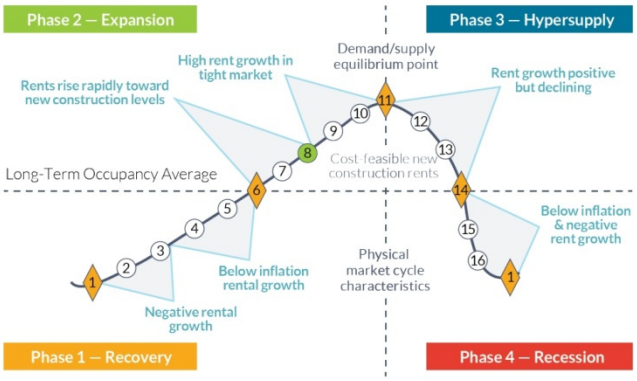


Fig. 2. Real estate cycle - rental growth rates. *Source*: Mueller, (2019-2023).

2. *Expansion* - in this phase, the overall economic situation improves, there is a general increase in employment, and demand for real estate, space and housing increases. The expansion phase is when the public begins to regain confidence in the economy. This is when the real estate market as well as tenants and property buyers begin to again generate demand. While the market is on an upward wave (rents and property prices are beginning to rise) the investor should intensify efforts to invest, develop or redevelop properties. Developed properties should be prepared to sell at the end of this phase or at the beginning of the oversupply phase for more than market value.

3. *Hypersupply* - investors and developers go into a buying and selling frenzy to meet rising demand. These actions inevitably trigger the arrival of a tipping point where supply begins to outstrip demand. Reasons for this condition can be found in too much inventory on the market, a sudden change in the economy, or unpredictable events that cause a drop in demand. Property owners, during this phase, often sell or rent out their inventory for fear that their properties will remain empty or unsold. This is the time to take an "opportunistic approach," that is, to identify those properties that the investor is confident will perform well in the next real estate cycle - the recession. This is also a great time to employ a "buy and hold" strategy to have prospective properties for when the ideal time comes to sell again in the next phase.

4 *Recession* - The recession phase is well known in the real estate markets of the 21st century. The great financial crisis of the early 21st century, followed by a prolonged recession, left many markets struggling for many years. During the recessionary phase, supply far exceeds demand, and investors and property owners suffer from high vacancy rates. In addition, not only is there no rent growth, but some landlords are forced to offer reduced rents to attract tenants who are also suffering from the economic downturn. On another note, the recession provides an opportunity to purchase "distressed properties" at a steep discount. During this phase, there is an increase in the number of properties that have been repossessed and repurchased by lenders. This is an opportunity to purchase great properties with large savings. Purchased properties can be held in order to increase in value so that they are ready to go on the market when the economy begins to recover and recovery phases occur.

The real estate market cycle is influenced by many factors, so many, in fact, that it is almost impossible to provide a specific list. However, experts collectively point out that some factors are among the main ones, thus fundamentally affecting the real estate market cycle: demographics - the composition of the population and major changes in its composition can significantly affect the market; interest rates - these significantly affect the purchasing power of the potential buyers of real estate; the overall health of the economy - when the economy is doing well or on an upward trend, consumers feel more encouraged to buy residential real estate; government policy - governments sometimes intervene with policies to help revive a market that is particularly at risk of a recession or is in a prolonged recession; consumer confidence - this is simply their view of the economy, both in real time and in the future.

1.4. The real estate lifecycle

"The real estate market cycle" shows the cyclical nature of the functioning of real estate markets. This cyclicality is systemic in that it affects entire markets and all real estate. In this context, the REMC issue creates a space of common interactions of many

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factors that are creators in the real estate market. However, it should be noted that the issues of REM and REV can also be applied to REL.

The REL process of a given property is, by definition, individualized and concerns individual properties treated as an independent asset. REL allows individual - properties to be analyzed based on their immanent characteristics on the subject and object side. REL is a general description of how owners and investors identify, acquire, develop, operate and dispose of real estate. Every real estate manager or real estate appraisal process implementer realizes and knows that identifying a property within the REL framework is critical to the proper functioning of many business processes, and thus directly affects real estate processes. REL is one of many useful framework for understanding, measuring and improving indicators related to real estate management and valuation.

Real estate in the real estate market can be in various phases of REL. The primary ones include (Born & Pyhrr, (1994; The Real Estate..., 2023) (Fg. 3):

1. *Acquire* (Acquisition Phase) - activities in the acquisition phase of REL include, but are not limited to: identifying assets for potential acquisition, evaluating investment alternatives, obtaining financing, negotiating the purchase, and transferring ownership.
2. *Develop* (Development Phase) - the property is built or renovated to prepare it for lease or sale. Activities in the develop phase of REL include, but are not limited to: obtaining permits, preparing the construction project, implementing the construction project, managing subcontractors, managing construction financing.
3. *Operate* (Operation Phase) - in this phase, the property generates income or meets needs. This phase is usually the longest and lasts from one to several decades. The main activities in the Operate phase of REL include: and use of the property, generation and management of potential tenants, maintenance, improvements to the property, collection of rent, management of end-of-lease activities, renovation and preparation of units for future tenants, renovation of the property.
4. *Divest* (Divest Phase) - in this phase, the owner/developer sells the asset and ceases to be uninvolved. Activities in the real estate divestment phase include: identifying potential buyers, preparing the property for sale, negotiating the terms of the sale, transferring ownership to the new owner.

Properties on the real estate market, in most cases, are in the "exploitation" phase, which is usually the longest phase of a property's life cycle. This phase for different properties has a variable length depending on the type of property. In REL, there are many different aspects related to REM and REV.

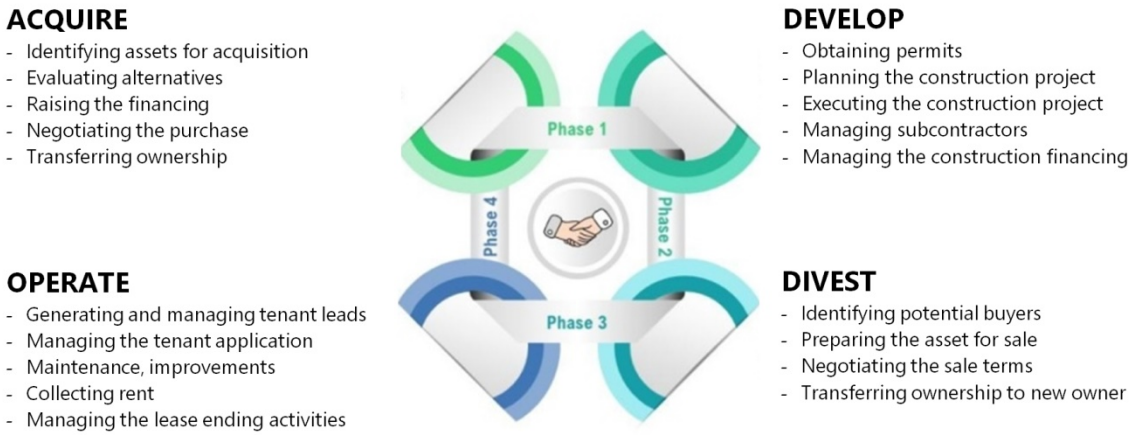


Fig. 3. Real estate lifecycle. *Source*: own study.

2. Material and methods

The research covered two issues of REM and REV, which were published in 365 scientific articles published in 40 quarterly articles in the journal of Real Estate Management and Valuation from 2013 to 2022. All analyzed articles were published in open-access. The analyzed issues were referred to and placed in the context of the concept of REMC and REL.

The article used the method of analyzing and critiquing the literature, which allowed to review the analyzed content in the context of the research

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objective. A comparative analysis method was used in selected areas. The heuristic method and the method of analysis and logical construction were used.

The analysis was carried out keeping some assumptions in mind:

- concepts, issues and definitions of a fundamental and systemic nature were analyzed; due to the volume of the article, concepts and issues with a smaller scope of meaning were not included - however, this does not mean that the issues that were not included are less important in terms of content,
- within the framework of a given concept or issue, the authors who were the first to deal with the concept or issue in the analyzed period are first indicated; in addition, other people who made important contributions within the analyzed concept are also indicated,
- the article used a principle, according to which, in substantive issues, the primary role was given to the author of a given work; specific quotations from the work of a given author were indicated; in some cases, additions were made, whereas in others, parts of the quotations were removed so that the citation better conveyed the sense of the author's statement,
- some citations do not contain original (in a given text) references to other authors; such a procedure was a deliberate action with the assumption that, after reaching for the indicated source, the reader will find additional bibliographic sources to cite,
- the indicated basic issues were referred to REMC and REL – the details are included in Table 2,
- in Table 3, a detailed list of individual concepts with reference to individual authors and relevant sources has been prepared.

The literature analysis and comparative analyses performed are primarily qualitative in nature. Nevertheless, the analyses included a quantitative element related to the frequency of various research questions. Table 1 shows the basic quantitative characteristics of the analyzed articles.

The article assumes that individual research issues will be documented with citations extracted from the analyzed scientific articles. These citations were provided with references to the bibliography. Based on this assumption, extensive literature was included at the end of the article, which formed the basis for the performed research and analysis. In the following chapters, the most important and basic concepts, issues and definitions pertaining to the analyzed issues are indicated, using citations.

Table 1

Basic quantitative characteristics of the analyzed articles

Year of publication	Number of articles	Number of authors	Number of countries which authors come from
2013	41	62	6
2014	41	78	5
2015	40	79	7
2016	32	53	6
2017	33	57	9
2018	40	55	6
2019	40	68	20
2020	34	67	24
2021	32	72	22
2022	32	68	23
Total	365	659*	128**

* - authors may repeat themselves in particular years
** - countries may be repeated in individual years
Source: own study.

3. REM - results

3.1. Real estate management - integrated approach, definitions

According to Kucharska-Stasiak (2016, p. 367), the notion of real estate management can be understood as a set of activities aimed at securing the capital (market) value of real estate and (when possible) to exceed it. The author assumes that, as a result of the management process, the individual value of the property should be close to the market value or (if possible) higher. Other authors define the concept and its various aspects by referring to the following quotes:

> *"The essence of real estate management can be reduced to managing – in the majority of cases in conditions of uncertainly – complicated construction and technical facilities, performing various utility, economic and social functions, and to achieving specific goals set by the owner."*
>
> (Nalepka, 2006, p. 26),

> *"The specific conditions of real estate management include: the requirement to implement long-term business objectives and the need to ensure the most stable effects of this activity, maintaining and increasing the value of*

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real estate, and caring for various property attributes (location, architectural, construction-technical, economic) the preservation or improvement of which affect the value of the property, as well as formal attributes – property rights and liabilities -arising in the property management process and also co-determining their value."

(Śliwczyński, 2000, p. 23)

"Real estate management is a process of making the right decisions based on appropriate analyses and, consequently, activities ensuring: safety and efficiency of use in a non-deteriorated condition, proper economic and financial management in the facility, and justified property improvement, hampering the loss of its value and increasing its value over time."

(Gawron, 2010, p. 21)

"The real estate management process slightly differently. In her concept, the author specified five processes: the analysis of real estate conditions, the planning process, organization process, the process of operation management and implementation of tasks, and the control process, at the same time indicating the external and internal surroundings of the real estate management area."

(Rymarzak, 2009, p. 43)

Property management is defined as a complex, continuous and systematic process of analysis, planning, management and control of real estate portfolios designed to increase transparency for the property owner (or investor), to strike a balance between income and the risks of real estate investment and management decisions related to the property portfolio. It constitutes a very important and dynamically changing field.

(Cienciała, 2019, p. 97)

Muczyński (2015) notes that real estate management activities evolved with the development of the real estate industry, the needs of property investors and general changes in the market environment. Today, these activities require an a comprehensive approach on the one hand, but on the other, are more and more specialized. He further defines the concept by referring to the following quotes:

"An important step to organizing and standardizing the abovementioned management activities was to create a statutory definition of real estate management. According to the original version of this definition, real estate management consists of making all decisions and taking all activities necessary to maintain the real estate in proper condition in compliance with its purpose, as well as making justifiable investments in real estate."

(Muczyński, 2015, p. 5)

"Real estate management is a process focused on achieving a number of various (technical, economic, social and environmental) goals pursued by the owners, which is to permanently keep the managed object adjusted to the changeable market, social, and economic environment."

(Muczyński, 2015, p. 6)

"This modern, broader approach to real estate management is proactive, comprehensive and strategic, reaching far beyond short-term tasks. It involves looking at real estate (or groups of such assets) in the long term perspective, throughout its life cycle and against the background of a complex and constantly changing market environment."

(Muczyński, 2015, p. 6)

"The evolution of this broader approach, having adopted general business theories, has led to the formation of three organizational levels of real estate management. (...) the first level includes real estate portfolio management - REPM (portfolio investment policy, performance-analysis portfolio, investment scheme), the second one is real estate asset management - REAM (estate policy, performance analysis of estates, marketing policy, relation management, organization and outsourcing), while the third one deals with property management - PrM ("daily" administrative, technical, commercial and promotional management)."

(Muczyński, 2015, p. 6)

"REPM encompasses the strategic management of a group (portfolio) of properties to achieve value and benefit that derives from the management of individual assets. REAM is interpreted differently, depending on the context of management and consequent strategic objectives for assets: (1) in the field of real estate investment management (REIM), managing real estate assets is to maximize their financial value; (2) corporate real estate management (CREM), when a company owns and uses the real estate

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of its non-real estate business, the main goal is to maximize corporate value or profits; (3) public real estate asset management (PREM) are distributed differently than in the private sector, because social benefits and the effective implementation of public tasks and functions by the real property are emphasized here. REAM fulfills the explanatory and connective role between the first (REPM) and third (PrM) level of real estate management. Property management (PrM) in the present approach involves the effective implementation of strategies optimal for the owner on the level of the managed object.). In larger commercial or institutional properties, where the management of buildings is more complex, the above tasks have evolved into a specific area of activities referred to as facilities management (FM). FM consists of four constituent parts, i.e. space management, technical management, administrative management and management of other services."

(Muczyński, 2015, p. 6-7)

"The analyzed concept presents the real estate management structure in a multidimensional approach which consists of three core dimensions and two situational ones. The core dimensions describe the major aspects of real estate management and include criteria such as: the life cycle phase, perspectives of real estate activities, and management levels. In turn, the situational (or contextual) dimensions include criteria such as: the real estate segment (type) and the location of the property."

(Muczyński, 2015, p. 14)

Oyeyoade and Araloyin (2019) dealt with the concept of green management. The most important citations include:

Green management identifies with sustainable development as both corroborate on the realization of global interdependence, environmental accountability, social responsibility, and economic viability. It can be also considered an operational concept positioned to nurture the elements of an adopted sustainable concept with a view to having comprehensive green benefits.

(Oyeyoade & Araloyin, 2019, p. 80)

The green management concept was develop ed when there was a necessity to look into the material composition of products in use, the rate at which various products were being consumed, the disposability and or recyclability of the waste products, and the likelihood of best alternatives to toxic(harmful) or non-biodegradable products at all levels of global activities.

(Oyeyoade & Araloyin, 2019, p. 80)

Considering the specific nature of the construction industry, the green management concept focuses on the proactive operations of three components: green building, green energy and green waste.

(Oyeyoade & Araloyin, 2019, p. 80)

Sustainability and green management concepts can reduce multiplication of building or facility stocks as well as the rate of energy consumption. This implies that ineffective or moribund resource allocation in terms of the indiscriminate springing up of buildings or facilities could be curtailed by adopting a retrofitting concept to adapt the unsustainable stocks to attaining sustainability and, subsequently, an enhanced environmental setting

(Oyeyoade & Araloyin, 2019, p. 81)

3.2. Real estate management – value, income, return investment

Abdullah et al. (2015, p. 50) wrote that in a broad and general sense, the enhancement of the asset value of relevant properties as well as maximizing the generated income or return investment are the main objectives of real estate management. As a means of achieving this, Ching (1994) contends that real estate management practices can be applied to derive best performance in terms of financial and economic gains, social values, user satisfaction and asset optimization. ARNOLD and JOHN (1989) state that the enhancement of the asset value of a property is the main objective of real estate management. This is in accordance with Scarrett (1983), who opined that income and the capital value of assets can be maximized through real estate management. Abdullah et al. (2015) further define the concept by referring to the following quotes:

"The enhancement of the asset value of a property is the main objective of real estate management. Income and the capital value of assets can be maximized through real estate management."

(Abdullah et al., 2015, p. 50)

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> *"The key facets of real estate management comprise asset and capital value that should be leveraged by the stakeholders for the benefits of all parties. To that extent, it is evidently vital to ensure that the value of any property is maintained and enhanced by practicing real estate management so that investors or owners can achieve their targets."*
>
> (Abdullah et al., 2015, p. 51)

According to Kowalski and Kazak (2020) the implementation of the idea of value-based management assumes ongoing monitoring of the expenses incurred by the enterprise and the value that has been generated as a result of the company's operations on the market. The implementation of such a management system could have a positive impact on increasing the level of economic security in the real estate sector, by providing decision-makers with instruments to measure the economic situation of enterprises.

Rymarzak and Trojanowski (2013, p. 8) consider the following:

> *"Each property [in the context of real etate management] should be assessed in terms of its current use versus its best possible use in order to determine its market value. It should be pointed out here that market value will vary significantly, especially on markets lacking equilibrium between supply and demand."*

Ziemba et al. (2015, p. 90) consider the following:

> *"Comprising the highlighted concepts SCREM* [Sustainable Corporate Real Estate Management] *will include the dimension bound with management by value. It will be a system that allows creating and maintaining value by improving the management of business processes in order to increase the productivity of CRE* [Corporate Real Estate] *(property performance), understood as: functional quality, technical quality, cultural & social quality, economic performance, and environmental performance. This approach requires distinguishing between different categories of property values based on the concept of value based management (VBM), in addition to values commonly analyzed in CREM* [Corporate Real Estate Management]*: market value, investment value, or use value. SCREM also refers to: environmental value, social value, public value, cultural value, and image value."*

3.3. The concept of asset management

Rymarzak and Trojanowski (2013, p. 7) noted, back in 2013, that compared to the traditional definition of real property management, "asset management" covers a wider range of activities and is not confined to the operational stage, but refers to the whole lifecycle of the property. They further define the concept by referring to the following quotes:

> *"Asset management is a process of making decisions and their implementation related to real estate acquisition, use and disposal."*
>
> (Kaganova, 2012)

> *"It is a kind of activity which ensures the optimization of the use of properties owned by an entity, thus enabling it to carry out its business and achieve its long-term objectives."*
>
> (Jones & White, 2008)

> *"Asset management covers numerous operations and activities performed in a variety of areas, including, e.g., inventory, valuation, portfolio analysis, auditing and reporting."*
>
> (Fernholz & Fernholz, 2007)

These authors conclude:

> *"Each property, in the context of asset management, should be assessed in terms of its current use versus its best possible use in order to determine its market value. It should be pointed out here that market value will vary significantly, especially on markets lacking equilibrium between supply and demand."*
>
> (Rymarzak & Trojanowski, 2013, p. 8).

3.4. (Sustainable) Corporate Real Estate Management

Kłosowski (2018, p. 6) believes that corporate real estate (CRE) is not clearly defined, as there is a broader and narrower meaning (Konowalczuk & Ramian 2014, p. 61). According to Kooymans (2000, p. 2), CRE is a term that is generally used in a broader sense in relation to real estate which is owned by an enterprise, regardless of whether for investment or for use. According to Manning and Roulac (1999, pp. 268-269), CRE is a property that is a productive asset of a traditional enterprise whose main activity is usually not related to the development, investment and financing of assets such as real estate. According to Zeckhauser and Silverman (1983, p. 111), CRE is land and buildings at the disposal of enterprises whose main activity is not real estate management.

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The starting point of the concept of the corporate real estate management process, in a narrower sense, is to carry out the management of real estate with due diligence, which is, on the one hand, its driving determinant, and on the other - the beginning of the process. In the concept of the CREM process, four main sub-processes constituting the corporate real estate management process were outlined, reflecting the classical management process: the sub-process of corporate real estate planning (CRE planning sub-process), the sub-process of organizing corporate real estate (CRE organizing sub-process), the sub-process of the implementation of corporate real estate (CRE implementation sub-process) and the sub-process of controlling corporate real estate (CRE control sub-process).

Kłosowski (2018, p. 8) determinants of the corporate real estate management process were divided into external and internal ones. Following Kłosowski (2018, p. 6), important quotes can be given:

> *"External determinants concern the economic environment (e.g. localization decision, demand and supply on the real estate market, CRE risk, relation with suppliers), legal environment (e.g. the act on spatial planning and management, local administration), the technical and technological environment (e.g. IT tool s) and the socio-cultural environment of the real estate (e.g. customs, social norms, cultural norm s). The internal determinants of the corporate real estate management process, among others, include: employees' skills, CREM strategy, tools (methods)used in CRE management style, organization size, the stage of the organization's life cycle (age of organization), and the stage of the real estate life cycle (age of the real estate). External and internal determinants, their changes and possible directions of changes should be taken into account at every stage of the corporate real estate management process. The objective of the process is to ensure the economic efficiency of CREM and, consequently, to increase the economic efficiency of an enterprise."*
>
> (Kłosowski, 2018, p. 8)

> *"The corporate real estate management plan should include all the real estate, regardless of the legal title held by the company, in accordance with the definition of CRE adopted in the paper, i.e. operational as well as investment real estate which it owns or which it holds other rights to (e.g. lease, tenancy). In order to make the process efficient, it is important, among others, to determine its purpose and the qualifications of the person responsible for the process, adopt the methods for developing plans, and to establish IT tools used in the planning process."*
>
> (Kłosowski, 2018, p. 8)

Ziemba et al. (2015, p. 85-86) noted that real estate is one of the most important resources of an enterprise and its proper management is a condition for gaining a competitive advantage. Modern Corporate Real Estate Management (CREM) should combine elements that, in a sustainable manner, take into account market demands, environmental concerns as well as the needs of users and the business environment. In addition, real estate management should result in achieving the highest efficiency while providing for the varied requirements of corporate stakeholders and considering different perspectives of the time in which the effects of the decisions taken will become apparent. Ziemba et al. (2015) further define the concept by referring to the following quotes:

> *"Those challenges are met by the concept of Sustainable Corporate Real Estate Management (SCREM), which recognizes the interests of both internal and external stakeholder groups. As owners and users of real estate, enterprises are responsible for the impact of their investments as well as the use of buildings on the environment. Their awareness and responsibility should be seen in such formulation of investment strategies and real estate management that considers the environmental, social and cultural expectations of external stakeholders, i.e. society."*
>
> (Ziemba et al., 2015, p. 86)

> *"It is therefore necessary for businesses to adapt new management paradigms and concepts that will enable the optimal use of existing resources and expertise, with a view to maintaining a sustainable and distinctive position in a competitive environment, and at the same time will respect the expectations of external stake holders related to the well-being of both present and future generations."*
>
> (Ziemba et al., 2015, p. 86)

> *"The model* [SCREM] *integrates and expands ideas that are essential for corporate real estate*

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management and sustainable business model, and takes into account the following management dimensions: process-oriented, organizational, financial, behavioral, technological, environmental, social, and cultural."

(Ziemba et al., 2015, p. 86)

"SCREM will need to be able to translate the needs of the business into a coherent supporting strategy; communicate effectively with managers of the business; and adopt techniques to demonstrate the impact of workplace improvement on business performance."

(Ziemba et al., 2015, p. 87)

The imperative of sustainability in corporate real estate management has recently been considered as an integral part of almost every business activity in different industries and sectors, including private and public ones.

(Ziemba et al., 2015, p. 88)

Kłosowski (2018) further define the CREM concept by referring to the following quotes:

"CREM concerns the management of buildings and undeveloped real estate being at the disposal of private and public organizations whose main activity is not real estate management."

Kłosowski (2018, p. 6)

"CREM deals with a broad aspect of corporate real estate management, starting from routine daily management activity, ending with activities in the field of strategic planning of CRE and asset management."

Kłosowski (2018, p. 7)

CREM includes tactical and strategic programs and plans, operational decisions, asset trading, contracts, investments an d real estate development projects in order to effectively ensure the achievement of strategic and tactical enterprise objectives.

Kłosowski (2018, p. 7)

3.5. Social housing management

Muczyński (2016) argues that social housing management is an area of public real estate management strongly dependent on systems and housing policies in individual countries. In many of them, housing systems are in transition as a part of a general trend towards the privatization, deregulation and decentralization of public tasks. As a result of these changes, social landlords have become more dependent of private capital and are forced to operate in a more business-like manner to keep their financiers satisfied. Thus, the transformations in institutional and economic context have lead to more market-oriented social housing (asset) management. He further defined the concept by referring to the following quotes:

"Social housing management is defined as the set of all activities to produce and allocate housing services from the existing social housing stock."

(Priemus et al., 1999)

"In the past, management of the existing social housing stock consisted, first of all, of day-to-day maintenance and administration. Strategic decisions about investments in the housing stock were made mostly by governments rather than by individual landlords. Now, most housing management in the social rented sector is the responsibility of public, semi-public or private housing managers: housing associations, housing corporations, municipal companies, or local housing authorities."

(Muczynski, 2016, p.58)

"Housing management activities consist of a variety of actions, categorized into technical management (maintenance, renovation, etc.), social management (housing allocation, etc.), financial management (treasury, rent policy) and tenure management (letting, buying, selling)."

(Muczynski, 2016, p.58)

"Another subdivision of the specified categories is the distinction between day-to-day (operational) and strategic housing management. Strategic housing management sets the priorities and direction for the future. Short-term decisions are reactions to daily problems, but they have to fit in with long-term policies."

(Muczynski, 2016, p.58)

4. REV - results

4.1. Analysis of transaction prices on the real estate market

Maleta (2013) noted that the purpose behind the analysis of transaction prices on the property market in order to determine the impact of the time trend is to build a model based on one

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independent variable - time. The consequence of this approach is the omission of all other aspects of the property which are assumed to be included in the price of real estate. She then points out the important issues related to it, using the quotes:

"The proper analysis of a local market on which property is valued can reveal a group of similar properties which, due to their characteristics and along with an appropriate sample size, will provide the best update on transaction prices on the date of the valuation. The importance of the time trend is critical to the accuracy of valuations carried out on local markets where transaction price growth is significantly noticeable or very large."

(Maleta, 2013, p. 29-30)

"A temporal trend in valuation is a tendency that shows the general direction of the phenomena, that is changes in the level of transaction prices and the analysis of these changes over the course of time. The phenomenon of changes in the price level over time assumes various functional forms."

(Maleta, 2013, p. 30)

"A trend is a sequence of observations related to transaction prices in subsequent units of time. Depending on the ad opted function, a corresponding regression model can be considered. The trend can be dynamic or static. In the case of a static trend, adjustments to transaction prices are not made and time is treated as another attribute of the property."

(Maleta, 2013, p. 30)

4.2. Uncertainty of property valuation

Kucharska-Stasiak (2013) dealt with the issue of uncertainty in real estate valuation. She believes that property valuation is characterized by uncertainty, understood not only as uncertainty of a single valuation, but also as a discrepancy between multiple valuations of the same property carried out at the same time and for the same purpose. A valuation is only an estimate, the outcome of which depends on the assumptions adopted by the valuer. Such assumptions may account for the potential of a property in a complex market environment in different ways. She then points out the important issues related to it using the following quotes:

Both appraisers and their clients would like to believe that the value given is a true value, which is a myth. Valuation does not lead to true value because all valuations are biased. The only questions are "how much" and "in which direction". The direction and magnitude of bias in your valuation is directly proportional to who pays you and how much you are paid. Valuation does not ensure an exact estimate of value as "there are no precise valuations."

(Kucharska-Stasiak, 2013, p. 17).

"Valuation uncertainty is perceived as a symptom of errors in valuation. (...) Research into the problem of uncertainty is indicative of the emergence of new trends in valuation theory that aim to revise the notions rooted in the neo-classical theory of valuation and adopt a new perspective on them. To do so, the valuer need to take into account the behavioral interactions of market actors in a market that exhibits extremely low efficiency and in which both parties to transaction realize they can affect the price. In such a market, it is much more complicated to determine value than in markets with large numbers of transactions, where nobody can influence the price, and where the traded goods are highly uniform."

(Kucharska-Stasiak, 2013, p. 18).

"Uncertainty of property valuation is exceptionally high due to both the characteristics of real estate (e.g., variation in physical features, diversity of legal titles, high capital intensity) and the characteristics of the real estate market (e.g., lack of uniformity, very high imperfection, and low efficiency), as well as human behaviors. The level of uncertainty depends on the degree of market development in a given country, including the legal system (the collection of legal acts pertaining to property law; spatial planning), market transparency (e.g., lack of data or data is difficult to access), and education of property valuers. The level of uncertainty rises during periods of high volatility in the real estate markets. It may also be increased due to pressure exerted by the clients."

(Kucharska-Stasiak, 2013, p. 19).

"In the studies conducted so far, an important problem was the method of measuring valuation uncertainty. For the uncertainty of individual valuations, the following methods have been proposed: risk scoring, standard deviation, coefficient of variation, triangular probability

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distribution based on three absolute values, the Monte Carlo model."

(Kucharska-Stasiak, 2013, p. 21-22).

"In relation to the uncertainty of valuation understood as a value range, there has been a discussion concerning a permissible difference between valuations, termed the margin of error. Actually, this range may be the subject of court decisions, and exceeding the margin of error may be deemed negligence in valuation. The magnitude of the accepted margin of error is decided by the nature of the property and the market situation. In valuations of residential properties, the accepted margin is less than 5 % but may be as high as 15 % for very unusual properties or for valuations concerning not very active or highly volatile markets."

(Kucharska-Stasiak, 2013, p. 22).

"There will always be a degree of uncertainty in any valuation, and this rises sharply when a combination of the rare characteristics of real estate and the thin market lead to the model being unable to predict with confidence of accuracy."

(Lee & Park, 2020, p. 16)

"If the process of identification and description of uncertainty was provided, it would greatly assist many decision-makers and improve the credibility of the valuation work."

(Lee & Park, 2020, p. 17)

4.3. Property mass valuation

Foryś and Putek-Szeląg (2018) wrote that mass valuation of real estate requires meeting a combination of several demands, such as estimating a large number of real estate properties in a short time, and, above all, carrying out calculations using the same tools. Econometric models ensuring that the above requirements are met are widely used throughout the world. Their application is subject to the fulfillment of assumptions, which, in practice, turns out to be difficult, especially in a market with low information efficiency, which the real estate market is an example of. Hence, apart from classical models, including multiple regression, there are proposals of non-classical models. They then point out the important issues related to using quotes:

"The ad valorem property tax is applicable in well-established market economies, and thus mass valuation methods of real estate are accepted and applied."

(Foryś & Putek-Szeląg, 2018, p. 90)

"In developing countries as well as those that have undergone an economic transformation in recent decades, the process of mass property valuation is hampered by the high cost of this operation upon its first application."

(Foryś & Putek-Szeląg, 2018, p. 90)

"Technical progress and the development of IT t ools facilitate the use of dispersed databaseresources for mass valuation using econometric methods as well as the widespread application ofalready used methods, especially for fiscal purposes."

(Foryś & Putek-Szeląg, 2018, p. 90)

"In particular cases, the mass valuation model may be used to determine the market value of real estate on the basis of which the cadastral value of the property will be determined."

(Foryś & Putek-Szeląg, 2018, p. 99)

"The results obtained and the accuracy of the estimation using a non-classical model in relation to actual transaction prices are at a satisfactory level. Compared to classical econometric models, the advantage of the model used is the possibility to use variables showing strong co-linearity in valuation so long as they constitute an important source of information. The assumptions of classical econometric models need not be checked. In addition, it can be used to separately valuate properties for each surveying area with a relatively inactive market in which few transactions are traded."

(Foryś & Putek-Szeląg, 2018, p. 100)

4.4. Automated valuation models (AVM)

Chmielewska et al. (2020) dealt with the problem of AVM. Below are the most important quotes:

"AVMs were defined as mathematical computer programs used by market analysts to determine the value of real estate based on location research, market conditions and real estate features based on collected information."

(Chmielewska, et al., 2020, p. 3)

"AVMs may use regression, adaptive estimation, neural network, expert reasoning, and artificial intelligence programs. The achieved results can be used as a basis for determining the value of

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real estate only if the real estate appraiser is sure about the quality and significance of the input data, that is whether the output data will be credible and sufficient to perform the task."

(Chmielewska, et al., 2020, p. 3)

"In most countries, the use of AVM is limited. It is very important to put emerging methods based on evolutionary theory (not included in the standard) in the context of normally accepted methodologies."

(Chmielewska, et al., 2020, p. 3)

"According to the authors, it is worth undertaking efforts to popularize the use of genetic algorithms as a representation of evolutionary methods to build an AVM on the real estate market, especially due to the universality of their use and the ability to choose the right parameters for the given type of problem."

(Chmielewska, et al., 2020, p. 11)

4.5. REV - important definitions and concepts in quotes

Property value:

"Property value is an estimate determined on the valuation date taking account of future benefits expected of the asset. It is the most probable price represented by the price hypothesis prevailing in the market. As such, it is neither an average value nor a lowest or highest market value. Some properties may not have a market value for their present use."

(Kucharska-Stasiak, 2018, p. 120)

Residual value:

National and international valuation practice confirm the paradox of the DFC method that places a great emphasis on accurately forecasting cash flow s in the years of detailed analysis, when their significance may be disproportionately small in relation to residual value constructed with a number of simplifying assumptions. This means that the incorrect assumptions adopted when selecting a formula of terminal value bring with them a risk of the significant overestimation or underestimation of value.

(Żelazowski, 2014, p. 52)

Valuation methodology:

Valuation methodology, i.e. a set of property valuation rules, has developed over centuries, reproducing the changing concepts of economic value and principles of its measurement, and is influenced by legal regulations, cultural conditions and customs, different in individual countries, aswell as factors resulting from the different level of development characterizing real estate markets.

(Kucharska-Stasiak, 2014, p. 67).

"Valuation methodologies differ markedly between countries because they are based on agreements worked out by national valuation organizations. Analysis has shown that not only are the assumptions underlying the income approach different between the classical valuation schools but that they also evolve in time. One important effect of this evolution is the increasingly wide use of the US concept of valuation which is considered to give the fullest picture of the market including future changes in supply and demand."

(Kucharska-Stasiak, 2019, p. 75)

Multiple-based methods

"Multiple-based methods belong to the group of comparative business valuation methods. Based on their nature, the enterprise is worth what similar entities are worth. Multiple-based methods therefore reflect the idea of the so-called law of one price, based on which goods with similar characteristics should be sold at a similar price in competitive market conditions."

(Żelazowski, 2015, p. 27)

Fuel station valuation:

"The purchasers and vendors of commercial properties are concerned with the income which the facilities generate and the risk related to an investment in a given market section. Therefore, the factor that determines the value of a commercial property, including fuel stations, is the income assigned to it. In most cases, the profits method is the most appropriate of the available valuation methods. (...) Property valuation that makes use of the profits method requires the separation of the income assigned solely to the property owner from the income generated by the trade-related activity carried out on the property. This results from the fact that the property value is assessed solely on the income assigned to the property owner"

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(Czaplińska et al., 2017, p. 24-25)

Hope value:

"Hope value is the difference between the existing use value and the price that the market might pay for the property with the hope of a more valuable use. In this case, the property value should reflect the value of potential economically viable changes to the property which, inter alia, are legally permissible at the date of valuation."

(Renigier-Biłozor & d'Amato, 2017, p. 92)

Redefine property valuation - environmental direction

"There is an obvious need to redefine property valuation so that it highlights not only the economic merits of a property but also its environmental, social, ethical and moral attributes. A new type of value must be found, arising from different assumptions than those underpinning the current valuation methods."

(Kucharska-Stasiak & Olbińska, 2018, p. 68)

"It does not seem probable, however, that such a new value could be created simply by stretching the current valuation methodology to include new, environmental and social aspects. The reliability of this approach would be questionable. The creation of a new value, wider than the definitional and interpretational framework of market value and embracing what is immeasurable and latent today, but known to exist and to support the environment, would promote the concept of sustainable development and encourage the formulation of responsible real estate strategies. The value would not replace the market value as we know it today, but it would rather enhance it by displaying the competitive advantages of sustainable properties. It would also be an attempt at reconciling economic criteria with social criteria while considering externalities."

(Kucharska-Stasiak & Olbińska, 2018, p. 68)

Valuation of multi-component real estate:

"The valuation of multi-component real estate is an extremely demanding procedure that can be implemented in a comparative approach by using the parametric model or the conditional model. However, the models used in the method of statistical market analysis cannot be used uncritically."

(Adamczyk, et al., 2019, p. 40.41)

Cost method of valuation:

"Incorrect application of depreciation rate during computation contribute to the variance in the cost method of valuation. (...). The consequences of these anomalies could cause clients to receive lower or higher values for their asset."

(Anih & Usenemana, 2021, p. 85)

Valuation inconsistency and uniformity:

"Valuation inconsistency as the difference between estimated values by two or more valuers valuing the same properties. Inconsistency can also be considered when the same valuer considers two similar properties (in terms of legal rights, design, use and location) and treats these properties differently in terms of valuation principles."

(Paradza, et al., 2021, p. 69)

„There is a need to assess compliance with valuation law and practice as well as whether there is uniformity in the valuation methods used by different valuers."

(Paradza, et al., 2021, p. 69)

Hope Value:

Hope Value is not a new concept particularly in the United Kingdom where it is well understood given the specific nature of the country's planning system which often leaves developers at the mercy of local authority planners. Where planning consent for a proposed development is absent, at the date of valuation, the market value will reflect the additional value arising out of the hope that such consent will be forthcoming in the future, the amount of such "hope value" being dependent on the market's perception of the likelihood of such planning consent being granted.

(Grzesik & Źróbek, 2017, p. 24)

Hope Value is often mistaken for a value in the future, which it is not. It is always a part of the market value of the property at the date of valuation. Furthermore it is not the value reflecting in full, the benefit of the desired planning or building consent. Rather it is an element of value was considered as lying somewhere between the so called "Highest and Best Use" value of a property at the date of valuation and the value assuming that an even more value blouse which whilst at the date of valuation was not legally permissible was

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assumed to have become so. The actual amount of hope value would have depended on the respective negotiating strength of the parties to the transaction as well as to the extent of the perceived likelihood of planning consent for the desired development becoming reality and the expected length of time of a positive planning decision being made.

(Grzesik & Źróbek, 2017, p. 24)

"Hope value is used to describe an uplift in value which the market is willing to pay in the hope of a higher value use or development opportunity being achievable than is currently permitted under development control, existing infrastructure constraints or other limitations currently in place. It is an element within the Market Value of the property being considered... It will reflect an appraisal of the probability that the market places on that higher value use or development being achieved, the costs likely to be incurred in doing so, the time scale and any other associated factors in bringing it about. Fundamentally, it will allow for the possibility that the envisaged use may not be achieved. While descriptive of that uplift, it does not exist as a separate value but helps explain the Market Value of the property which must be judged from the available evidence just as much as any other part of the valuation. Hope value is not a special value as it represents the market place's reasonable expectations as to the opportunities offered by the property."

(Grzesik & Źróbek, 2017, p. 25)

It should be noted that "hope value" indicates much more strongly than the "highest and best use "principle that the determined market value involves more uncertainty as to how long a use will remain unchanged.

(Grzesik & Źróbek, 2017, p. 28)

Highest and best use:

"The concept of 'highest and best use' is met in a number of countries and some valuers in Europe may be asked to value a property on the assumption of its highest and best use. In essence that is the use that is actually permitted as at the date of valuation that offers the highest value. On analysis of the limitations intended to be imposed by its more formal definitions ... that excludes the hope value that the market might place on a property's potential opportunities that are not currently available. While finding the "highest and best use" of a property is an assessment of the property as itis on the date of valuation, it is not an assessment of the best use that the market might at that date reasonably envisage could be possible for it. This approach is thus Market Value limited by an assumption and not a simple market value or an element within market value".

(Grzesik & Źróbek, 2017, p. 25)

Dynamics of real estate value and market:

"The concept of value is characterized by peculiar dynamics; therefore, the value of a property is also characterized by dynamic traits. The analysis of the dynamic processes of the interaction between demand, supply, prices and the size of the real estate up for sale on the local market is an extremely important tool in carrying out the regional policy."

(Kuryj-Wysocka et al., 2014, p. 112)

"The prices analyzed must be examined not only in terms of their causal relationship with the characteristics of the property and the state of the market, but also in respect to the terms and conditions of the contract. This analysis must be carried out as early as at the preliminary stage of data examination."

(Gaca, 2018, p. 75)

"Housing markets be treated as complex adaptive systems with the characteristics of open, dynamic and non-linear systems, which – when influenced by the market environment – evolve in a characteristic way between various states of equilibrium."

(Bełej, 2018, p. 24)

"Due to the variability of stimuli, property markets, as dynamic systems, remain in stable states in the long term, and only periodically go into a state of instability, which can be seen as the exhaustion of opportunities for evolution in their current form and the need to search for a new, alternative path of development."

(Bełej, 2018, p. 24)

Uncertainty in real estate:

"Uncertainty, which is generally related to randomness, is a phenomenon that is difficult to examine. This results mainly from its source in

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social and economic phenomena, marked with complexity, nonlinearity and indeterminacy, which has a direct impact on subjective, objective and structural uncertainty."

(Brzezicka & Wisniewski, 2017, p. 76)

"Uncertainty, according to the behavioral definition, is the probability of the occurrence of an event as well as the conviction that it will or will not happen, expressed by suggestions regarding the future and its subjective assessment. According to this definition, uncertainty ought to be examined not only as regards to the objects but also the subjects. The behavioral approach assumes that uncertainty is not a domain of objects, but also of the subjects and the surroundings in which these objects and subjects function. Therefore, uncertainly expressed in this way seems to be more complete, as a result of which the processes by which it is identified and analyzed are even more complicated."

(Brzezicka & Wisniewski, 2014a, p. 31)

"Valuation uncertainty is perceived as a symptom of errors in valuation. Thus, research on uncertainty is crucial to the correct understanding of valuation reports and is of utmost importance not only for valuers (given their professional, civil, and penal liability), but also for their clients as the addressees of valuation reports."

(Kucharska-Stasiak, 2014, p. 18)

„Undoubtedly, uncertainty of property valuation is exceptionally high due to both the characteristics of real estate (e.g., variation in physical features, diversity of legal titles, high capital intensity) and the characteristics of the real estate market (e.g., lack of uniformity, very high imperfection, and low efficiency), as well as human behaviors."

(Kucharska-Stasiak, 2014, p. 19)

"The level of uncertainty depends on the degree of market development in a given country, including the legal system (the collection of legal acts pertaining to property law; spatial planning), market transparency (e.g., lack of data or data which is difficult to access), and education of property valuers."

(Kucharska-Stasiak, 2014, p. 19)

"The level of uncertainty rises during periods of high volatility in the real estate markets. It may also be increased due to pressure exerted by the clients."

(Kucharska-Stasiak, 2014, p. 19)

5. Conclusions

The concepts, issues and definitions presented in the area of REM and REV are presented using citations from the works of selected authors. In order to indicate the importance of these issues in the context of REMC and REL, a summary of the issues discussed in the previous chapters has been prepared in a tabular arrangement. This summary is presented in Table 2. It includes references of the analyzed issues to the "real estate lifecycle" (REL) and the "real estate market cycle" (REMC).

Table 2

Research issue in REMC, REL, REM and REV

Real estate lifecycle (REL)				**Research issue**	**Real estate market cycle (REMC)**			
Acquire	Develop	Operate	Divest		Recovery	Expansion	Hypersupply	Recession
				Real estate management (REM)				
		✓		*The concept of asset management* (Rymarzak & Trojanowski, 2013)	✓	✓	✓	✓
	✓	✓		*Real estate management - integrated approach* (Muczyński, 2015)	✓	✓	✓	✓
	✓	✓		*Real estate management – value, income, return investment* (Abdullah et al., 2015)	✓			✓
✓	✓	✓	✓	*Sustainable Corporate Real Estate*	✓	✓	✓	✓

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				Management (Ziemba et al., 2015)				
		✓		Social housing management (Muczyński, 2016)	✓	✓	✓	✓
				Real estate valuation (REV)				
		✓		*The concept of asset management* (Rymarzak & Trojanowski, 2013)		✓	✓	
✓			✓	*Real estate management – value, income, return investment* (Abdullah et al., 2015)	✓	✓	✓	
✓	✓	✓	✓	*Analysis of transaction prices on the real estate market* (Maleta, 2013)		✓	✓	
✓	✓	✓	✓	*Uncertainty of property valuation* (Kucharska-Stasiak, 2013, 2014)	✓	✓	✓	✓
		✓		*Property mass valuation* (Foryś & Putek-Szeląg, 2018)	✓	✓	✓	✓
		✓		*Automated valuation models (AVM)* (Chmielewska, et al., 2020)	✓			✓

Source: own study.

Analyzing the issues in the area of REM and REV, an additional Table 3 was prepared. This table summarizes individual concepts with their assignment to each REM or REV area, along with the source where they were defined or analyzed in detail.

Table 3

REM and REV - discussed concepts and definitions in the last decade

Concepts and definitions	REM	REV	Source
Asset management	✓		Rymarzak and Trojanowski (2013); Muczynski (2016); Adnan et al. (2021); Nikolaiev et al. (2021)
Behavioral aspects of valuation		✓	Brzezicka and Wisniewski (2014a, 2014b); Malik et al., (2021)
Corporate real estate (management)	✓		Muczyński (2015); Ziemba et al. (2015); Kłosowski (2018)
DCF method		✓	Żelazowski (2014); Czaplińska et al. (2017); Renigier-Biłozor and d'Amato (2017); Michaletz and Artemenkov (2018); Nawrocka (2018); Babatunde (2018); Konowalczuk (2018); Aihie (2018); Kucharska-Stasiak (2019); Florêncio and Alencar (2020); Ataguba (2021)
Dynamics of real estate value		✓	Belej (2013); Kuryj-Wysocka et al. (2014); Belej and Kulesza (2015); Kokot and Bas (2015); Bełej (2018); Nowak (2020); Brzezicka and Kobylińska (2021)
Earnings management (EM) in REM	✓		Nguyen et al. (2020)
Facility management	✓		Rymarzak (2014); Muczyński (2015); Ziemba et al. (2015); Oyeyoade and Araloyin (2019); Chikafalimani et al. (2021); Nikolaiev et al. (2021)
Green/Sustainability management and valuation	✓	✓	Ziemba et al. (2015); Kazak et al. (2016); Kucharska-Stasiak and Olbińska (2018); Oyeyoade and Araloyin (2019)
Management of facilities at public universities	✓		Rymarzak (2014); Chikafalimani et al, (2021)
Market value added (MVA)		✓	Kowalski and Kazak (2020)
Mortgage valuation		✓	Zbrojewski (2013); Siemińska and Krajewska (2016); Aliyu et al. (2018); Chong (2020)
Municipal housing stock	✓		Muczyński and Turbaczewska (2013); Suszyńska (2015); Nguyen et al. (2020); Muczyński (2016, 2023)
Property mass valuation			Barańska (2013); Foryś and Putek-Szeląg (2018); Doszyń (2019); Grover

			and Walacik (2019); Hozer et al. (2019)
Public (property) management	✓		Rymarzak and Trojanowski (2013); Gross and Źróbek (2013); Gross et al. (2014); Muczyński (2015); Nalepka (2015); Marona, (2016); Trembecka, and Kwartnik-Pruc (2018); Gross and Lin (2020); Muczyński (2023)
Real Estate Investment Trusts' (REITs)	✓		Zhu (2018); Coletta and Busato (2019; Adnan et al. (2021); Kowalke and Funk (2022)
Real estate management system	✓		Gross and Źróbek (2013); Źróbek-Różańska and Zielińska-Szczepkowska (2014); Gross et al. (2014); Kazak et al. (2015); Abdullah et al. (2015).; Nalepka (2015); Renigier-Biłozor et al. (2016); Źróbek et al. (2016); Trembecka, and Kwartnik-Pruc (2018); Cienciała (2019); Kazak et al. (2019); Gross and Lin (2020); Muczyński (2015, 2023)
Real estate market - REM	✓		Muczyński and Turbaczewska (2013); Foryś and Putek-Szeląg (2018)
Real estate market - REV		✓	Renigier-Biłozor et al. (2016); Barańska and Nowak (2015); Kokot (2017); Bieda (2018); Adamczyk et al. (2019); Gružauskas et al. (2020); Lee and Park (2020)
Real estate valuation methods		✓	Renigier-Biłozor et al. (2016); Barańska and Nowak (2015); Czaplińska et al. (2017); Michaletz and Artemenkov (2018); Buśko (2018); Babatunde (2018); Foryś and Putek-Szeląg (2018); Adamczyk et al. (2019); Gružauskas et al. (2020)
Residual value		✓	Żelazowski (2014); Aihie (2018); Kucharska-Stasiak (2019); Florêncio and Alencar (2020); Ataguba (2021)
Risk and uncertainty in real estate		✓	Wolski (2013, 2016, 2017); Brzezicka and Wisniewski (2014a); Kucharska-Stasiak (2014); Siemińska and Krajewska (2016); Cichulska and Wisniewski (2017); Nawrocka (2018); Lee and Park (2020)
Social housing management	✓		Suszyńska (2015); Muczynski (2016, 2023)
Spatial management	✓		Źróbek-Różańska and Zielińska-Szczepkowska (2014); Rymarzak (2014); Kazak et al. (2015); Źróbek et al. (2016); Ogryzek (2018)
Valuation of land property		✓	Maleta (2013); Bieda (2018); Buśko (2018); Foryś and Putek-Szeląg (2018); Grover and Walacik (2019)
Valuation of public spaces		✓	Palicki (2013); Wolny (2014); Barańska and Eckes (2023)
Valuation of residential space		✓	Groeger (2013); Kokot and Bas (2015); Foryś and Putek–Szeląg (2017); Kokot (2017); Guijarro (2021); Munshifwa, (2021)
Valuation standards		✓	Źróbek and Grzesik (2013); Źróbek et al. (2013); Kucharska-Stasiak (2013, 2014); Walacik et al. (2013); Kucharska-Stasiak and Źróbek (2015); Barańska and Nowak (2015); Renigier-Biłozor and d'Amato (2017); Konowalczuk (2017); Grzesik and Źróbek (2017); Kucharska-Stasiak and Olbińska (2018); Babatunde (2018); Konowalczuk (2018); Gružauskas et al. (2020); Anih and Usenemana (2021)
Value-based management	✓		Kowalski and Kazak (2020)

Source: own study.

The analytical material gathered in the article allows for a better understanding of the issues that have been studied by the authors of articles published in REMV in the last decade. The summaries prepared in Tables 2 and 3 allow for a better analysis of REM and REV in the context of REMC and REL.

The performed analysis of the published content allowed us to draw a clique of conclusions. The most important of these are:

- the authors of the articles dealt with many different and important issues in the area of "real estate management" and "real estate valuation" - many of these issues were analyzed by researchers and teams of researchers around the world,
- analysis of the indicated citations allows us to conclude that the topics of research carried out by authors from all over the world had, during the period in question, many common links and references - this conclusion indicates that the articles published in REMV in the last decade have a worldwide character, thus the journal fits well into the current international scope of research,
- articles published in REMV in the last decade represent the stature and importance of the

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journal Real Estate Management and Valuation in the field of "Management" and "Valuation".

The analyses carried out indicate that the article's goal of reviewing the definitions, concepts, scope and structure of REM and REV related to REMC and REL based on the research of authors of scientific articles published in REMV in the last decade has been fulfilled. REMV is one of the leading sources of scientific knowledge on REM and REV in Poland and an important source of scientific knowledge on real estate in Europe and throughout the world. The article presents a wide scientific output in the area of REM and REV, which has been published in REMV. Thus, it should be concluded that the main objective of the article has also been fulfilled.

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