PREDMET IN NAMEN VREDNOTENJA NEPREMIČNIN TER NJIHOV VPLIV NA METODE VREDNOTENJA IN PODATKOVNE ZBIRKE

OBJECT AND OBJECTIVE OF PROPERTY APPRAISAL AND THEIR EFFECTS ON VALUATION METHODS AND DATABASES

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IZVLEČEK

Namen prispevka je primerjati pomen vzporednih metod ocenjevanja vrednosti nepremičnin, izvedenih na ekonometrični in neekonometrični način. Na podlagi analize formalnih pogojev ter opredelitve tržne vrednoti nepremičnine sta bila testirana oba pristopa, s čimer smo želeli preveriti, ali je mogoče rezultate predstaviti na enak oziroma primerljiv način. Pri tem je bil poudarjen pomen opredelitve tržne vrednosti nepremičnine v povezavi z opredelitvijo predmeta vrednotenja. Rezultati raziskave so pokazali, da je za primerljive rezultate ocenjevanja tržne vrednosti posamezne nepremičnine nujno zagotoviti predvsem jasno opredelitev podatkov, na katerih temeljijo izračuni, ter rezultate ocenjevanja vrednosti nepremičnin, ki se nanašajo na isti predmet oziroma skupino/razred predmetov. Prispevek nadalje vključuje razpravo na temo primerljivosti rezultatov ocenjevanja tržne vrednosti nepremičnin pri večkratnem ocenjevanju. Izpostavljeno je, da je pogoj za primerljive rezultate večkratnih ocenjevanj tržne vrednosti nepremičnin ustrezna zbirka podatkov o prodanih nepremičninah. Primerljive rezultate vrednotenja je mogoče pridobiti le z uporabo istih oziroma primerljivih referenčnih podatkov. Za vrednotenje nepremičnin je treba torej vzpostaviti ustrezno podatkovno zbirko o nepremičninskem trgu, ki je popolna in dostopna ocenjevalcem vrednosti nepremičnin.

ABSTRACT

The purpose of this paper is to compare essences of parallel methods in property appraisal, being done in econometric and non-econometric ways. Through the analysis of formal conditions and on the background of the definition of the real estate market value, both of analysed methods are tested, whether they can lead to results that can be interpreted in the same way. The key role of sense of the market value connected with reality of precisely defined objects of appraisal, was emphasised. Presented considerations lead to the conclusion that the necessary condition for a positive assessment of the results of calculations as a conclusion concerning "the market value of a specific property", is verifying the type of data on which the calculations were based, and if obtained result refers to a specific object or to a certain group/class of objects. Another discussed problem of property valuation is the recurrence of several estimations. It was explained that in order to obtain a number of similar quote evaluations an appropriately compiled database about sold objects must exist. Only when everyone uses comparable reference data it can be expected, that estimations using these data can give comparable valuation results. The response to a need of such databases is making relevant, accessible and complete data about the property market.

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1 SCOPE AND METHODOLOGY OF RESEARCH

The object of the analyses conducted below is to determine, on the basis of formal conditions, against the background of the definition of the market value of a property and with a precisely defined object of appraisal, whether statistical methods of property appraisal (generally recognised as nominally the most objective ones) and simplified methods (especially in the comparative approach) can lead to similar results, and whether these results can be interpreted in the same way. What are the reasons behind the observed differences between the results of appraising the value of a property according to different methods (or groups of methods)? The conclusions drawn from the discussion of these questions were used, in turn, to indicate the demands placed on the cadastral system by the sectors of economy which exploit the knowledge about property value.

The research was conducted using the monographic method, basing its argumentation on inductive reasoning and research results discussed in the literature on the subject.

The considerations presented here are an element of the discussion about the methodological character of property appraisal (quantitative methods versus qualitative analysis), and, at the same time, they are an involuntary voice in the intellectual dispute between the supporters of econometric methods in appraisal and valuation surveyors. These two groups should rather continuously exchange views and experiences. However, it should be understood that these disputes are of pragmatic nature and serve the purposes of professional marketing. In the expert circles, there has always been a quiet conflict going on, having its roots in the egoistic view that everyone is better as an individual than their competition. The intention behind the current article is to disregard the above-mentioned disputes and to incline the ego of everyone interested in the topic towards a conciliatory attitude to the presented problem, so that, on the basis of logical reasoning, they could search for the objectively best model of obtaining adequate data and employing them in broadly and narrowly understood property appraisal. a part of the enquiry is also an evaluation of the role of the criterion of similarity between properties in the market methods of real estate appraisal.

2 WHAT IS THE OBJECT OF THE PROCESSES OF PROPERTY APPRAISAL?

The object of valuation, as understood in the considerations presented below, will be " a property" perceived in a way which may be slightly narrowed down, but at the same time it is specific and precise, so that the term is not confused with generalised or idealistically understood notions with a similar semantic from. It is assumed, then, that the term "property" will be understood as a specific fragment of land parcelled out from the surrounding space with permanent boundaries, to which its owner enjoys a set of rights designated by the relevant provisions of the law (land property), or premises in a building, analogously separated, with the relevant body of rights. In the Polish law, which is closest to the author of the present article, both objects of valuation considered here are described, respectively, as "land property" in the Polish Civil Code (Civil Code Act, 1967) and as "premises" in the Act on the Proprietorship of Premises (Act PP, 1994). The two types of property indicated above are defined in a very similar way also in the law of the USA, UK or Germany. The American term "real estate" stands for „Land, buildings, and things permanently attached to land and buildings" (West's Encyclopedia, 2005), while the British meaning of the term is: "property consisting of land and the buildings on it, along with its natural

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resources such as crops, minerals or water" (Stoebuck and Whitman, 2000). In Germany, the analogous immovable item is referred to as "Immobilie/Grundstück," meaning "Land with buildings, attachments and accessories" (Kuntze, 2006).

However, there are certain problems with juxtaposing parallel terms concerning "separated space in a building." The most general word which describes it is "a flat". Cultural differences result, however in the Americans using the term "apartment" to refer to what the British, the Australians and New Zealanders call "a flat." Nevertheless, certain differences in the possible standard of the described premises play a role here. In the German legal system, the equivalent of the term "flat" is "Wohnung," specified in the Act on Appraisal (BewG, 1934). One permanent characteristic of all the terms cited here, though, is the unambiguity of the location in space of the objects corresponding to them. They are not any objects; they are specific objects.

All the realties indicated above can be connected with objects characteristic for properties, constituting their so-called component parts (buildings, fences, trees, plumbing, heating, light fixtures). An immanent element of the above-mentioned real estate is also a set of rights through which a party (e.g. the owner) can exercise their control over it. The most important premise of the definition introduced above is illustrating the fact that "property" (apart from the formal and legal interpretation of the rights to it) is nevertheless an object. An object, or an ontologically perceived concrete with its unique characteristic features, physical, legal and economic.

A property as a considered object of appraisal cannot be, then, the notion of an immovable item itself, or any idea of a property; neither can it be an object typical for a certain community or representing a selected set of properties (e.g. residential property in city A, office premises in city B or leisure plots at the seaside). a property as a potential object of appraisal always has to be an unambiguously identified object.

For such identification, it is indispensable, then, to confront the legal definition of property valid in a given legal system with the material and formal way of describing reality which is (or should be) offered by the cadastre or its local equivalents (in the current Polish legal reality, the role of the cadastre is played by the so-called "Rejestr Ewidencji Gruntów Budynków i Lokali," or "Registry of Land, Building and Premises"). In the cadastre (or the corresponding registries), properties are described in a more pragmatic way. They are identified as plots (or collections of plots) with unique identification numbers, which, in turn, refer to physical space through the relevant systems of geographical information. For the purposes of the description of the property, the property identification number and the coordinates of its central point provide invaluable information about one of the most important features of the property which is its location. Premises are registered in a similarly unambiguous way, and the simplest designation of their location can be, for example, their address. With location defined in such a way, an opportunity is provided to estimate the quality of location or, at least, the possibility to select the analysed objects.

3 WHAT TYPE OF PROPERTY VALUE IS THE OBJECT OF APPRAISAL?

The notion of value is very comprehensive. It is used in many spheres of human life, as well as in science created by people. In science, it has been functioning since antiquity and as civilisation changes progressed, it concerned different spheres of human life. In its most primary meaning, it was linked to certain non-material terms describing ethical issues. Since the times of Plato, values included such notions as justice,

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wisdom, temperance and valour (Albert, 1991). Such a classification has left a trace in the current human sciences (philosophy, ethics, pedagogy, psychology) in the form of value theories, which consider value from the point of view of the subject, but also include the question of the value of objects, known as objectivism and subjectivism (Kwaśnicki, 1998). In these fields, value is understood as "everything considered important and valuable for an individual and the society, and by all means desirable, linked to positive experiences and constituting the aim of human endeavours." Value in this understanding is thought to be "a measure of evaluation of persons, objects, phenomena (...)" (Łobocki, 2003).

In objectivism, values are properties of entities (including objects or notions), existing independently of the manners in which they are perceived by subjects (people). Thus, they are autonomous. They are objective, absolute and generally applicable in their nature. An example of values considered in this manner are truth, good (in ethical categories) or beauty.

Subjectivism sees value from an opposite point of view. Even in philosophical considerations, it perceives values as the effect of an interaction between the subject and the analysed (valued) object. According to it, values are secondary in relation to the object (good in economic categories). They are defined through the attitude of the valuing subject to the object of valuing. Therefore, they are subjective. Narrowing it down to economic issues, value usually stands for "a specific benefit (...) measured with the amount of obtained goods, or (...) usually with money" (Reber and Reber, 2005).

The main problem the theory of value tries to solve is the question of the origin of prices of goods and services in economy, or, indirectly, the identification of factors which determine their value. The solutions to this problem were historically searched for on the basis of two differing approaches, which, for the purposes of the simplification of considerations, can be divided into two types:

– The classical approach (classical/labour theory of value)
– The subjective approach (subjective theory of value)

The classical theory of value explains the final price of a good or service with the costs incurred in producing/rendering it. To be precise, past tense should be used in reference to the discussed theory, as the history of economy has proved its incorrectness. According to this theory, the price constitutes (or: constituted) the cumulative cost of material factors (raw materials, intermediate products and tools), as well as the costs of labour necessary to produce a given good or to render a given service. Due to the emphasis placed on the factor of labour, this theory is also called the labour theory of value. However, this theory failed to account for the difference between the sum of the costs and the market price as well as the real value of the product (Kwaśnicki, 1998).

The subjective theory has been found useful in modern economics. Subjectivism in the ideas of economics was the most precisely defined by Mises, who claimed that "economics is not about things and tangible material objects; it is about men, their meanings and actions. Goods, commodities and wealth and all the other notions of conduct are not elements of nature; they are elements of human meaning and conduct. He who wants to deal with them must not look at the external world; he must search for them in the meaning of acting men" (Mises, 1996). According to this declaration, the subjective theory is based on individual assessments of value made by market participants, and defines the market price of a selected good as the result of negotiations between a number of parties whose needs, knowledge,

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intentions and attitudes are conditioned by differing factors. Subjective currents in economics gave rise to almost all modern economic currents and modern theories of value, including the contemporary notion of "market value."

Taking into account the aim of further discussion, that is determining what is really being appraised in the appraisal process and which economic characteristic is the object of appraisal, an essential problem is the dichotomous nature of the notion of "market value." Even ignoring the discussion about the proximity of meanings of the words "value" and "price," it is difficult to find an unambiguous definition of market value/market price of any object, and especially of property, in the literature on the subject. Cannone and Macdonald (2005) even put forward a thesis that the profession of appraisal disregards the theory of value. This problem was broadly discussed both in textbook publications (Appraisal Institute, 2000; McCluskey et al., 2013) and by particular researchers. The discussion about the topic is already very long, as proved by voices from as long as thirty years ago (Albritton, 1982; Shlaes, 1984). Basically, until the present day, no uniform definition of the notion of "market value" has been developed in the environment of economists, especially in reference to property. Depending on the circumstances resulting from the aim of particular publications, whose result is appraising the value of a property, the synonyms of this term which are used include such expressions as: "full value," "true value," "appraisal value," "actual value," "fair cash value" or, finally, "just value" (McCluskey et al., 2013; Altmeppen and Brauer, 2009). Only the environment of people who appraise real estate professionally focused their attention on this question, offering basically a single definition of the term (which is outlined below). Its most important element is focusing on referring to the value of a specific property as a specific element of reality, and not of "a certain property on a certain market" (Regulation RM, 2004; BMUB, 2006; SCPFVA, 2009; IVSC, 2010; ASB, 2017; RICS, 2017). a good illustration of this precise view is the discussion about particular approaches to property appraisal, held by Lorenz and Lützkendorf (2011), in which the factor of the individuality of the object of appraisal was emphasised.

A range of other conditions which are decisive for the idea of market value are still subject to discussion, however. For some researchers, the more relevant question is that of the current manner of using a property (Thomas, 1995; Prystupa, 2010). For others, a more important factor which is more determining for the usefulness of a property (and, at the same time, for its market value) is its best possible use (McParland et al., 2002; French, 2003; Kucharska-Stasiak, 2007, 2010). Each of the discussants presents weighty arguments to support their point of view; these, however, cannot be cited in the current article due to their extensiveness. On the other hand, they are too important to be discussed in a secondary thread of the current considerations. Therefore, they shall remain beyond this discussion.

As it has already been mentioned, for the needs of the practice of property appraisal, a number of analogous definitions of market value have been put forward. They have been introduced both to the professional principles of property appraisal (BMUB, 2006; SCPFVA, 2009; IVSC, 2010; ASB, 2017; RICS, 2017) and, simultaneously, to national legislation. An example can be the German law (Baugesetzbuch, 2004; ImmoWertV, 2009) or the Polish law (Act RPM, 1997), as well as numerous examples from the legislation of Australia, New Zealand, the Republic of South Africa (McCluskey et al., 2013). The common element of the particular definitions of market value is still the declaration that the market value of a property is the equivalent of the sum of money which can be yielded from the sale on the date of

the appraisal, on the free market and assuming that both the seller and the buyer have decided to carry out the transaction. This definition is usually supplemented with stipulations that the market character of the transaction, and, consequently, of the obtained price, can be attributed to direct transactions, concluded between parties who are knowledgeable and well-informed about the features of the object and costs of the transactions ("Market value is the estimated amount for which an asset should exchange on the date of valuation between a willing buyer and a willing seller in an arm's length transaction after proper marketing wherein the parties had each acted knowledgeably, prudently, and without compulsion" (IVSC, 2010)).

Obviously, the above-mentioned professional standards in appraisal stipulate the existence of cases in which the basis for appraising value is not the market value. There is, however, a clear distinction between such situations. The analysis conducted below does not take these cases into consideration.

What is the most essential for the main topic of the present considerations is to articulate that not every accounting procedure concerning property appraisal, though performed on the basis of the highest mathematical standards, has to lead to an irrefutable result, finally interpreted as the market value of the object of valuation. One of the more important criteria according to which the result of appraisal can be interpreted in such a way is the relevance of this result to the specific object of valuation.

4 A COMPARATIVE ANALYSIS OF THE METHODS OF PROPERTY APPRAISAL

The discussion above about the meaning of the notion of "value," implied in the practical applications of economic analyses, has proved the need for logically distinguishing a narrowed concept of "the market value of a specific property." This conclusion, in turn, calls for a deeper analysis of the very process of determining value. There is reasonable suspicion that among the multiplicity of ways of determining the value of objects or rights over objects (including rights to property), not all of them can aspire to be the algorithms of determining "the market value of a specific property" as a narrowed category of value.

The supporters of statistical methods treat them as a tool which enables them to solve basically any computational task. Observing the number of applications, or of attempts at applying these methods, one indeed sees the need for confirming their usefulness. In the following part of the discussion, the validity of using statistical methods in every case of property appraisal will be considered. Due to the fact that most econometric analyses are conducted with the use of statistical tools, a certain equalisation of terminology takes place, consisting in treating econometric methods as statistical methods. In spite of a certain imprecision in the equalisation of the above-mentioned terms, for the purposes of the present considerations they shall be used interchangeably.

The essence of statistical concepts lies in constructing a relevant set of a number of equations with many unknowns in order to recognise the core of the studied phenomenon or process and to indicate their mathematical model. Key problems which affect the final success of the arithmetic process are: the selection of variables (understood as the identification of significant variables) and determining the values of parameters of the constructed model, satisfying various (depending on the selected calculation method) minimum criteria. Therefore, econometrics has at its disposal a large arsenal of methods of variable selection (from numerous methods of discriminant analysis (Gatnar, 2008), methods focused on

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studying correlations between variables (Fornell and Larcker, 1981), to (de facto correlational) concepts of database information capacity (Hellwig, 1968)). In reference to questions related to the appraisal or analysis of the real estate market, the object of econometric modelling is the price or the value of a property. Designations of these words in econometric modelling, however, are no more than general terms and do not refer to any specific element of the analysed market. Econometric methods require accumulating observations about the values determined by the highest possible number of factors, so that e.g. elimination of negligible or redundant factors is possible (Gatnar, 2008; Foryś and Gaca, 2016), as well as the selection of their most favourable configuration. Every factor should be present in possibly all variants of intensity. In order to achieve appropriate conditions for model equations, it is necessary to find possibly the highest number of combinations (juxtapositions) of particular values of explanatory variables. It makes it necessary to gather large and vary large sets of price observations (the explained variable) and the descriptive data (the explanatory variables). In reference to analyses of property, adhering to this principle is extremely difficult and makes it necessary to search for information beyond the most adequate local markets (Foryś and Gaca, 2016). The data describing the objects of sales which have already been carried out can also include information characterising the phenomena accompanying transactions or characterising the narrower or wider market environment of a specific property market (Zyga, 2012). The amount of data subjected to analysis in a single computational process basically rules out the possibility of employing simplified appraisals; thus, in the above-mentioned analyses only statistical methods are of practical use. However, in the case of econometric valuations whose aim is to appraise property in the understanding of the above-mentioned legislation concerning appraisal or Appraisal Standards, their Achilles' heel is the question of the suitability of the market data in reference to the object of target appraisal. It is not even necessary to rely upon relatively rigid legal definitions of market value, nor upon equally clear definitions in various professional standards. It is enough to ask the client of an appraisal based on other data than the (preferably local) property market if he or she is willing to base on it his or her economic or commercial decision.

The literature on the subject is full of reports of successes achieved all over the world in the discipline of determining the value of property. The analysis of reference data often shows (Osland, 2010; Beamonte et al., 2013; Kryvobokov and Wilhelmsson, 2007; Dąbrowski, 2010) that calculations were based on the bidding data, secondary data or data concerning dissimilar objects, from other property markets, or generally on different data (for example, data about car sales). In spite of the highest regard for the technological side of all the presented analyses, in spite of nominal declarations that their aim is property appraisal, their results can hardly be considered to be examples of estimating "the market value of specific properties." They can at most be attempts at estimating the "typical value" for certain groups of property or apartments. In addition to that, the typicality of property needs to be considered independently in each case. It does not mean, obviously, that the results of all sorts of appraisals with the use of econometric methods require the commentary above. There are numerous examples of correct use of widely understood methods of mathematical statistics in property appraisal, where, apart from rigorous calculations, the basis for analyses is the information about transactions concerning relevantly similar properties, or at least properties and not any data correlated with the property market (Czaja, 1997; Hozer, 1999; Barańska, 2005, 2010; Kleiber, 2005; Adamczewski, 2006; Kontrimas and Verikas, 2011; Bourassa et al., 2010; Mach, 2017).

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At the polar opposite of the concepts and methods of calculating the "market value of a specific property," there are groups of simple solutions (e.g. comparative methods, methods based on the concept of capitalisation of average income). The essence of simplified methods is the processing (extremely easy in mathematical terms) of the data and information from the market which is possibly the closest as far as its geographical location is concerned, and maximally similar to the object of valuation. There is definitely less such information. The idea of a comparative approach is based on the assumption about the existence of a group of factors affecting the observed prices of all properties which are to be analysed in the same way. As a result, it is possible to ignore in the analyses a large amount of observations (prices) and their attributes (and, therefore, also the relevant explanatory variables). Once it has been stated that the evaluations of a specific group of features (attributes) of the objects included in the study are identical or very close (Zyga, 2011), and the objects described with them are considered as similar, the subsequent analysis focuses on examining the changes in prices versus the remaining explanatory variables. The way to determine the optimal value of the appraised property is to assume mean values in the relevant groups of data. This measure is for some an expression of the primitivism of the simplified approach. For others, it is an expression of pragmatism, and, at the same time, a sophisticated form of heuristics.

As a side note, econometricians are willing to treat the models of comparative methods, after suitable formal modification, also as specific econometric models. It is highly comforting, as it attests to recognition given by one group of professionals to the activities of another.

The dispute as to which manner of property appraisal is better has been going on for a long time, however. Its beginnings can be traced back to the period when computers, taking over the computational process, began to be commonly used. The current article, however, focuses on the aspect of this dispute concerning the result of particular algorithmic solutions in the context of the data on the basis of which it was obtained, and in the context of the manner of identification of the object of appraisal the result of the final appraisal (insofar as it is anticipated at all) refers to. What kind of "value" should be seen as a result of appraising a "property" with the use of well-tested "desk appraisal" algorithms, and what as a result of valuing "almost manually?"

In the case of simple calculation methods, the question of suitability of data is not a problem, as, by definition, the data selected for comparisons and calculations based on them need to originate from transactions concerning similar properties, from the closest markets possible. Such properties are in principle characterised by a large number of identical features (including those identical with the object of appraisal) (Zyga, 2011, 2012; Foryś and Gaca, 2016). Therefore, a relatively small amount of the remaining descriptive data (features differentiating between the objects of transaction) does not pose a major problem. The selection of specific similar properties in the procedures of the comparative approach in fact results in certain subjectivity in the appraisal. This is what the criticism of many supporters of econometric purism is based on. In small data sets, it is relatively difficult to assess correlations between the gathered data concerning the compared properties (which of their features are stronger and which are weaker). Sometimes knowledge about these correlations tends to be implemented in the calculations in a way from the outside, based on historical experience or taken from similar markets. In such cases, the results of averaging performed during the estimation of the final result can be (and usually are) somewhat uncertain (Zyga, 2005). As it ensues from the research quoted above, with reliable valu-

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ations of the features of properties on sale, it is possible to achieve the quality of estimation at the level of MPE <10%. It should be stressed that in all cases of such valuations the data on which estimation is based refer to properties maximally similar to the properties which are being valued. The obtained results of calculations are, in turn, referred to specific objects, and not to objects which are representative for a given group of properties.

The current comparative considerations lead to the conclusion that the necessary condition for a positive assessment of the results of calculations as a conclusion concerning "the market value of a specific property" should not only include the technical criteria of the calculation method itself (i.e. relevant values of particular statistical tests), though, obviously, they also need to be met. The basic element of the final criterion of evaluating the kind of "values" among which the obtained number can be included is verifying the type of data on which the calculations which determined it were based, and if the obtained result refers to a specific object or to a certain group/class of objects.

5 CONCLUSIONS CONCERNING METHODS

Analysing the results of available studies quoted above, one can draw the following conclusions. The results of calculations aimed at determining the value of the same properties, performed with the use of different methods (econometric or simplified), often lead to results which are significantly divergent. And this is not exclusively the fault of the differing perception of valuation surveyors. However, this aspect should also be taken into consideration. The basic reason is still the differing sources of data about the property market (respectively: numerous, but not very detailed, or relatively more thorough, but smaller in number for procedural reasons). Moreover, econometric methods do not simply lead to determining the value of specific properties, but are intended to demonstrate model values for typical properties in particular groups of properties. Therefore, it is not possible to compare these results with the attempts to estimate "market values." In special cases, when the goal of some statistical analysis is to estimate the value of a specific property, the identification of the result as the "market value" of the appraised object is based only on maintaining the rigour of the comparative approach (selection of relevantly similar properties for the analysis).

Zyga's research (Zyga, 2010) has shown that simple methods of appraisal and econometric methods (realised in practice through statistical methods) can lead to approximate and equally credible results. Achieving proximity of estimations of model values to the estimations based on the criterion of similarity (as the basic premise) requires only consistency in using similar or even identical data from a relevant market (as appropriate: local, regional or national), and in both groups of methods - the rigorous use of the criterion of the similarity of properties. Another research indicates the positive role of the selection of comparative properties in minimising the mean error of the estimated value obtained both in simplified methods (Zyga, 2005) and in statistical methods (Zyga, 2016a). Both in the case of using simplified calculation methods and statistical methods, the condition for a significant improvement in the accuracy of estimations of values of various model properties was the selection for analysis of such properties which were similar to the appraised model property. The study by Posten and Mussweiler (2017) also leads to analogous conclusions, though in different research areas. They claim that „comparative thinking is an efficient cognitive strategy that reduces judgemental uncertainty. (…). Similarity-focused comparisons

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seem to facilitate information-transfer, which has been suggested to drive the uncertainty-reducing effect of comparisons". In a situation when there exists an appropriately compiled database about sold properties, the data from which would be used both by entities performing appraisals with the use of simplified methods and those who do it using statistical (econometric) methods, it should be expected, then, that the results of particular appraisals will become significantly more similar to one another.

6 CONCLUSIONS FOR THE CADASTRAL DATABASES

The concern of the economies of a number of countries is the potential uncertainty of property appraisal, demonstrated, among others, by the discrepancies between the results of particular appraisals of the same properties or groups of properties. As it was discussed above, a way to counter this problem is to rigorously refer to similar objects (properties). Drawing attention to the question of similarity directs it, as a consequence, toward the problem of data about properties used by the particular analysers (researchers, valuers), who employ basically any method of valuation. In order to obtain repeatability of results of arbitrary appraisals in relevant groups of properties, it is necessary to use the same (or very similar) compilations of information about the property market. a logical response to such need, then, is making relevant, complete and the same data about the market and its elements available to all those who need it. Its existence and transparency (even with limited accessibility) would be indirectly of an advantage to those who perform appraisals (both simple appraisals concerning single objects, and mass appraisals performed with the use of econometric methods). However, the main beneficiary of the proposed changes would be the clients of appraisals, which are of use in many various areas of economy and public administration (credit exposure updates in banking systems, appraisals for tax purposes, imposing government and public agency charges). Therefore, it is the appraisal clients who should be especially concerned with introducing an additional possibility of verifying the results of estimating property value and with achieving repeatability of the results of subsequent appraisals.

In a situation when there is no single reliable source of data not only about the prices themselves, but also about the characteristics of the sold objects, particular publications related to property appraisal are necessarily based on individually collected data. In spite of the due diligence of researchers, there is no guarantee that this data will be the same as in other studies (including scientific research) conducted simultaneously and on the same topic, or in commercial appraisals. In scientific research, usually conducted in an original and individual manner, and concerning phenomena and processes of endemic nature, the lack of repeatability of results is not a pressing problem. In the appraisals whose aim is valuation of assets with legal or economic effects, and which, in addition, are performed en masse and periodically, the threat of the eventuality of poor reliability should be taken seriously. In spite of such high demand for data concerning the most comprehensive possible descriptions of sold properties, such data, except for the cadastral systems in the Netherlands and Germany, is practically missing in the public registries of prices.

Therefore, the call for depositing the above-mentioned, but complete information about property sales and prices in public databases is well-grounded. The best solution would be if these were databases integrated with land information system, or the cadastre. Another recommendation is to provide state supervision, protection and guarantee to such databases (e.g. in terms of the completeness and credibility of information). Such databases should satisfy the needs of many entities. Therefore, their exclusive nature would be inappropriate from the point of view of the needs of democracy and the free market.

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Examples of good practices in terms of collecting data about sold properties are the cadastres from the Netherlands and Germany. On a smaller scale, similar databases function in many other countries, but do not collect the complete data which, in its nature, are necessary in performing appraisals. The examples of the latter are the bases of the Polish cadastre (*Rejestr cen i wartości nieruchomości*, *Registry of property prices and values*) (Zyga, 2016b; Zyga, 2017), the Lithuanian, as well as Latvian and Estonian cadastres (Parsova et al., 2012) or e.g. collections of data about real estate market administered by state organisations in the USA (Kucharska-Stasiak, 2010).

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