Chapter 6
Intuitive Methods Versus Analytical Methods in Real Estate Valuation: Preferences of Polish Real Estate Appraisers

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Abstract Market analysis is one of the basic and essential stages in the process of estimating the market value of real property. In this context, both the legal provisions in force in Poland and the methodological guidelines contained in the valuation standards leave appraisers with considerable flexibility in the use of specific methods. The research referred to only that part of the market analysis which focuses on a dependency study and ultimately aimed at determining materiality and subsequently the magnitude of the impact of market characteristics on the differentiation of transaction prices. The chapter analyzes the methods used by Polish real estate appraisers and the context of using the conclusions resulting from the analyses. The study provided the response on the appraisers' preference for valuation approaches and methods. On the basis of the conclusions of the study, a critical assessment of the causes influencing the range of applied analytical tools identified was also carried out. In summary, on the basis of the collected results, recommendations regarding possible changes to legal regulations and professional norms relating to the studied area of professional activity were presented.

Keywords Intuitive methods · Real estate valuation · Real estate market analysis Market value

6.1 Introduction

The analysis of the data constituting the basis for deducting the value of real estate is one of the basic elements of the valuation process and falls within the obligatory activity, which is the analysis and characteristics of the market (Isakson 1998).

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Both the market analysis itself and its component, i.e., the analysis of relations between prices and characteristics of real estate, have not yet been specifically codified (Foryś and Gaca 2016). To date, both practical and scientific studies covering market analysis issues have basically only referred to specific methods and techniques that can be used (Dell 2004, 2013; Emerson 2008; Fanning 2014; Fleming and Nellis 1994; Foryś 2009). However, there is no analysis in the literature referring to the current scope of the use of the analytical methods described in the literature and applied in practice (Gaca 2016). This chapter is an attempt to complement this area of knowledge by presenting and analyzing the experience of real estate appraisers, both in relation to the methods of analysis and the valuation methods used in the comparative approach.

Under the property valuation system in force in Poland, regulations of a legal and substantive nature are distinguished. Currently, within the framework of the latter group, apart from scientific and professional literature, there is also a set of valuation standards prepared and edited by the Polish Federation of Valuers' Associations under the name of the General National Valuation Rules. Both the provisions of law and methodological guidance in the valuation standards leave appraisers with considerable discretion in the use of market analysis methods.

The basic document that provides some guidance on the scope and detail of the analysis is now Interpretative Note (IN)—applying a comparative approach to property valuation. In this document (IN), which is one of the elements of the General National Valuation Rules in point 3.5. It was pointed out that the purpose of market analysis is to establish the characteristics (attributes) of real estate properties, hereinafter referred to as market characteristics. A real estate appraiser should assess the magnitude of the impact of market characteristics on the differentiation of transaction prices which may constitute market characteristics weights. The following section provides only general guidance on the principles for assessing the impact of market characteristics on the differentiation of transaction prices which include:

(a) the results of analysis of data on prices and market characteristics of similar real estate being traded on the market for the purpose of real estate market valuation;
(b) analogy with similar local markets in terms of type and area;
(c) examination and/or observation of preferences of potential purchasers of real estate;
(d) other reliable means.

Of course, market analysis is not only the analysis of relationships between prices and the factors influencing them. Market analysis is also a study of macroeconomic as well as microeconomic conditions constituting a broad market environment in relation to the object of valuation, which is a specific real property. The market analysis must also include an extremely important activity consisting in separating a collection of similar real estate which will ultimately form the basis for further deducting the market value of the property being valued.

In light of the above, the investigation generally referred to only that part of the market analysis which focuses on a dependency study and ultimately aimed at determining materiality and subsequently the magnitude of the impact of market characteristics on the differentiation of transaction prices. As it results from the analysis of objections raised by recipients to the content of appraisal studies, this element is currently one of the basic critical elements influencing the evaluation of the reliability of the work of appraisers. This is also evidenced by the conclusions of the Professional Responsibility Committee at the Ministry of Infrastructure as well as arbitration committees at local appraisers' associations.

6.2 Literature Review

The main problem in the real estate market is its low information efficiency. Therefore, decisions of many market participants are irrational and are the result of intuitive actions, imitation, and not decisions supported by a collection and analysis of reliable information (Thaler 2016). As Skinner (1978) stated, all human activity was a result of their genetic conditions and the influence of the environment in which they operated, in particular the social and physical environment. Ingrained views, the lack of openness to further professional development experiences, are a frequent reason for rejecting new solutions and methods. In addition, disseminating views about the absence of the need for change justifies part of the professional environment and discourages the use of innovative techniques and tools.

It is no longer disputed in developed real estate markets that it is necessary to use advanced statistics for the analysis of large data collections, market analysis, and mass valuation (Kane et al. 2004; Wolverton 2014). The use of advanced statistical methods for the valuation of a single property is problematic, and this still requires an in-depth market analysis in the estimation process (Kummerow 2002; Betts and Ely 2008). Therefore, in the educational process of real estate appraisers, more and more emphasis is placed on increasing competence of appraisers in the use of statistics and statistical analyses in valuation, and more and more people are convinced that the use of advanced statistical tools and models is appropriate (Pasymowski 2006).

The development of modern technologies and software of computational tools, with increasingly easy access to large databases, induces a change in the way of thinking about the problem of appraisal, in particular through traditional methods of data selection (Dell 2017). It requires appraisers to change their approach to the valuation process, from collecting and evaluating the quality of data and their ability to select them using statistical tools relevant to the analysis of large databases, the so-called *Big Data Analysis Interoperability Framework* (2015) techniques. This is particularly important both in the process of establishing a collection of similar properties and the ability to generalize the results obtained.

In the past, the challenge for appraisers was a lack of good data and the need to represent them with deliberately selected samples. Now the challenge is the

opposite: how to properly sort, examine, and draw conclusions from large collections of available data? The new situation requires a change of thinking about data collection and analysis for valuation purposes which are the basis of a properly conducted analytical process.

Hence, as Dell (2017) observes, proper use of quantitative analyses and econometric modeling is necessary for a new paradigm of market analyses for property valuation purposes. Big Data analysis and data mining allow the "new paradigm of real estate value modeling" to evolve. Historically, the valuation theory has been developed in the context of few transaction data. The new concept continues on the path from the world of rare data to a world of large data resources. It forces real estate appraisers to a new vision of the traditional valuation process.

Psychological, demographic, social, and cultural factors are a barrier to a new perception of the role of real estate appraiser. Recalling once again the behavioral concept of man in psychology, one can refer to conscious and forced stimuli (Majewski 2012). The first is the result of human disabilities in the interpretation of perceived phenomena (so-called anchorage effect) or from the system memory (e.g., cognitive load). Forced stimuli are triggered by subconsciousness (pulse action). These include stress, panic, and herd effects. In the demographic context, there is a tendency or aversion to take up new challenges related to the gender or age of individuals. In the issues discussed, age or work experience can play an important role in a new perception of reality. Social factors are environmental elements, shaping social, ethical, and opinion-forming attitudes, which in a closed professional environment may become decisive for shaping new attitudes toward the aforementioned professional challenges.

6.3 Scope of Data and Organization of the Study

In order to diagnose both the scope of applied methods of analysis and applied valuation methods, a survey was conducted on the group of real estate appraisers, participants in the National Discussion List. Therefore, the survey carried out referred to a targeted rather than a random sample, which has to be taken into account in the sample of generalizations of the results obtained.

The survey carried out with the use of an online form asked questions relating to the type of methods used to determine the effect of the characteristics on price differentiation, the range of methods used in the comparative approach, the number of collections of similar real estate properties used as the basis for the analysis, and the collection constituting the basis for determining the effect of the characteristics on price differentiation when using mathematical methods.

The survey was carried out in July and August 2016 and repeated in January and February 2018, with 105 and 109 responses, respectively. As at February 1, 2018, a total of 7086 persons are registered in the Central Register of Real Estate Valuers maintained by the Minister of Infrastructure, and no persons who are deceased or not practicing the profession are deleted from the register. Hence, the sample in

both cases represents 1.5% of the total population of this occupational group, which meets basic expectations in terms of number.

Due to the type of research tool used, no non-response questionnaires were found and only for some questions the number of responses was incomplete. The maximum difference in this case was three responses. In the case of a question relating to the methods of analysis used and comparative approach methods, respondents were given the opportunity to make multiple choices. In the other cases, the questions were closed-ended with one answer possible. However, in the context of the questionnaire question relating to the collection being the basis for determining the influence of characteristics on price differentiation, mathematical methods were used and an open question was adopted, leaving open the possibility for the respondent's own answer. The survey was supplemented with personal information concerning the number of years of practicing the profession of a real estate appraiser.

6.4 Test Results

As evidenced by the results of an examination of the methods used in market analysis, and more precisely the impact of characteristics on price differentiation, the intuitive approach continues to play a dominant role in this respect. In a study conducted in 2016, its use as at least one of the methods was declared by as many as 46.70% of respondents, while in a study conducted in 2018 it was still 40.37%. Along with work experience, there is a growing tendency to use other than intuitive approaches to determine the impact of characteristics on price differentiation (correlation coefficient 0.93 in 2016 and 0.88 in 2018) and to analyze an increasing number of data collections for this purpose (correlation coefficient 0.85) according to the 2018 surveys, while there is no clear correlation in 2016 (correlation coefficient 0.22).

Among the methods of analysis, a significant share is also held by methods of analyzing the preferences of purchasers the application of which in 2016 was declared by 40.0%. However, the percentage of respondents using such methods decreased significantly in the 2018 study, in which 18.35% of respondents indicated the use of this method. Under the indicated methods, respondents were asked to indicate all methods used. It should be noted that the concept of examining the preferences of purchasers does not usually mean a professional survey of real estate purchasers, but intuitive decisions based on, at most, poll opinions among real estate agents.

The number of respondents declaring to use the classical *ceteris paribus* method was also significantly reduced. According to the 2016 survey, 25.71% of the respondents declared its use in 2018 to fall to 16.51% in 2018. The result obtained is very interesting in comparison with the experience of the authors gathered during numerous meetings with appraisers, where the percentage of people declaring using this method was 1–2%. Perhaps, in non-anonymous responses given at training

courses on statistical methods, the respondents did not dare to admit poor activity in the area of advanced methods of analysis, or it was the fact that those methods were favored encouraged them to participate in such training.

In the case of mathematical methods, the use of a simple correlation account (Pearson's linear correction) was declared by 34.29% in 2016 and only 21.10% in 2018. On the other hand, the number of people declaring to use nonparametric correlation supported by the method of adjusting prices to the "ceteris paribus" state increased from only 1.90% in 2016 to 6.42 in 2018. Relatively high proportion of appraisers declared the use of regression models. As for 2016, there were 47.62% declarations made in this respect. The percentage rose slightly to 50.46% in 2018 (Table 6.1).

In the case of a comparative approach, the basic method is still the method of comparing real estate properties in pairs, utilization of which declared 72.1% of the surveyed in 2016, but only 66.06% in 2018.

An important place in valuation practice is also occupied by the method of adjusting the average price which according to the data presented in 2016 was used by 54.8% of respondents, while in the next survey 54.13%. The smallest number of appraisers, amounting to only 7.62% in 2016 and 8.26% in 2018, declared the use of the market statistical analysis method which requires a more advanced technique of using statistical software. In reference to the methods used, the share of particular age groups is very interesting (Table 6.2).

According to the data from both studies, respondents with more than 16 years of experience were the dominant group. The situation was similar also in the case of persons declaring that the method of adjusting the average price was applied. However, this was not the case for respondents declaring the application of the method of statistical analysis of the reexamination market carried out in 2018. While in the first study the dominant group consisted of valuers with more than 16 years of experience, in the second study as many as half of the valuers were practitioners with less than three years of experience.

Another area of the study referred to the number of collections that were the basis for the deduction. In this case, the respondents could choose between close-ended answers, specifying number ranges. Within the scope of possible options, five collections of various real estate properties number were listed (Table 6.3).

Table 6.1 Methods used to determine the impact of characteristics on price differentiation (%)

Method	2016	2018	Change 2016/2018
Intuitive method	46.67	40.37	−6.30
Analysis of customer preferences (surveys)	40.00	18.35	−21.65
Ceteris paribus method (classic)	25.71	16.51	−9.20
Linear correlation (Pearson's)	34.29	21.10	−13.18
Rank correlation (Spearman's)	1.90	6.42	4.52
Multiple regression	47.62	50.46	2.84
Other (neural networks, etc.)	4.76	2.75	−2.01

Table 6.2 Methods used to determine the impact of characteristics on price differentiation (%)

Method	2016	2018	Change 2016/2018
Method of comparing real estate properties in pairs	71.43	66.06	−5.37
Method of adjusting the average price	54.29	54.13	−0.16
Method of statistical market analysis	7.62	8.26	0.64

Table 6.3 Number of collections of similar real property constituting the basis for analyses

Number intervals	2016		2018		Change 2016/2018
	Number of responses	Interest %	Number of responses	Interest %	
From 3 to 5	8	7.62	1	0.92	−6.70
From 6 to 10	14	13.33	6	5.50	−7.83
From 11 to 20	31	29.52	22	20.18	−9.34
From 21 to 30	20	19.05	29	26.61	7.56
More than 30	32	30.48	50	45.87	15.40

Table 6.4 Collection underlying the determination of the effect of characteristics on price differentiation

Collection definition	2016		2018		Change 2016/2018
	Number of responses	Interest %	Number of responses	Interest %	
Collection of similar real property constituting the basis for valuation	42	40.78	55	53.40	12.62
Collection of similar real property larger than the basis for valuation	49	47.57	45	43.69	−3.88
Collection(s) of different real property	12	11.65	6	5.83	−5.83

The survey results indicate a clear decrease in the share of small and very small collections. At this point, it should only be recalled that it is practically impossible to make any conclusion about the influence of real estate volatility on price volatility on the basis of collections with numbers below $n = 6$ (Czaja and Parzych 2007).

Another issue covered by the survey was the verification of respondents' knowledge of the principles of statistical reasoning. In this context, the survey participants were asked a question relating to the identity of the collection which is the basis for determining the influence of characteristics on price differentiation in relation to the collection constituting the direct basis of valuation, i.e., a collection of similar real property (Table 6.4).

The results clearly indicate an increase in the number of respondents who use collections of similar real property as a basis for estimating which are the direct basis for valuation. However, the percentage of respondents using data from wider

collections is still quite high. A detailed analysis of the responses in 2016 shows that among those declaring such a basis for concluding 41.86% were people declaring the method of comparing real property in pairs as the basic method. In such a case, it is possible to adopt for the assessment of the impact of characteristics on prices a collection of real property larger than the collection of real property accepted for comparison, provided that both the gap and impact of the characteristics resulting from the collection constituting the basis for determining the variability (Gaca 2016) are observed.

6.5 Conclusions

The results obtained allow for preliminary conclusions concerning the inclination of real estate appraisers to methods other than intuitive ones in everyday professional practice. However, they cannot be generalized to the entire population because of the failure to meet the requirements of a representative survey, although some assumptions can be made because of the way in which the survey was conducted (voluntary survey on an Internet forum, accessible only to real estate appraisers).

The results of the survey clearly indicate that the intuitive approach is still the dominant way of recognizing the influence of particular characteristics on prices and, consequently, the value of real estate among respondents. This circumstance may result from the appraisers' belief that it is not possible to use mathematical tools for real estate market analysis. Unfortunately, this state of affairs is very negative. While it cannot be excluded that in many cases of simple valuations, experienced appraisers are able to correctly recognize the influence of particular factors and characteristics on price volatility, the manner of their determination is not subject to any verification as a whole. This situation forces the appraiser to indicate his own experience and professional authority as the only source of findings. Unfortunately, this has seriously reduced public confidence.

The profession of real estate appraiser, which plays an extremely important role in a market economy, is a profession with all the prerogatives of the profession of public confidence. Those involved in this type of professions are expected not only to be ethical, but above all to have reliable answers, to use legible and verifiable methods of conclusion-finding. In this context, an improvement in the state of affairs should be seen in the popularization of mathematical methods, in particular statistical methods and econometric models in property valuation.

The existing scientific achievements in this field certainly constitute an excellent basis for the development of the educational sphere. Increased awareness of recipients of valuations and relative ease in gaining knowledge in the field of new techniques of drawing conclusions will lead, in the absence of development of the described methods, to further deterioration of the image of the profession. This state of affairs may, unfortunately, have a decisive impact on the acceleration of the implementation of automated models, making full use of the latest developments in statistics and econometrics, including data mining.

It should be emphasized that the survey is of a pilot nature; therefore, in subsequent stages, both the substantive scope of the survey and the respondent base will be extended, in the direction of representative surveys, allowing for far-reaching generalizations concerning the aversion of appraisers to use specialized analytical tools in the process of real estate valuation.

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