

TOWARDS SPECIALIZATION OR EXTENSION? SEARCHING FOR VALUATION SERVICES MODELS USING CLUSTER ANALYSIS

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Abstract

The paper delivers original data on specialization in property valuation services in Poland. Its aim is to identify relatively homogeneous groups of property appraisers taking into consideration the scope of services performed by them and the types of clients served. Based on the survey results, it was possible to indicate major models in property valuation services consistent with market applications, which allows us to verify the thesis on specialization in doing business in property valuation.

The research strategy approach is twofold. Firstly, we have used the agglomerative cluster method to divide the types of valuation services and appraisers' clients in order to find groups of similar valuation services and represent the main models of business in property appraisals. Secondly, we have applied the k-means partition methods to find relatively homogenous groups of respondents, taking into account the frequency of carrying out the particular types of valuations and clients served.

As a result of our research, we present four clusters combining valuations and client types which reflect the models of property valuers' professional activity, i.e: the market-oriented housing valuation model, market-oriented commercial valuation model, non-market-oriented judicial valuation model and non-market- oriented public valuation model. Research findings confirm the existence of three out of the four specialization clusters within the professional activity. We also extracted a group of appraisers operating on a broad scale, both when it comes to the types of services offered and clients served.

Key words: *property valuation, appraisers, specialization, cluster analysis, professional services.*

JEL Classification: *C10, L85, R30, R39.*

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1. Introduction

Professional activity in the field of property valuation in Poland is still evolving. The changes affecting the property appraiser's profession in Poland have sources in a broad variety of processes. The combination of a relatively young real estate market, gradual development, and improvement of valuation principles, multiple modifications of legal conditions of the profession, and natural changes in the socio-economic situation of the country are the primary factors. This article was inspired by our

own survey findings showing that Polish appraisers recognize the need to specialize in valuation services in order to ensure a competitive advantage on the local market. At the same time, they emphasize the necessity to expand their offer with complementary services, such as investment, legal, surveying and other consulting services, in order to provide comprehensive customer assistance (MAŁKOWSKA, UHRUSKA 2018).

The core of this research is an explanatory study identifying how valuation services in Poland are customizing to fulfill market niches. The primary aim is to recognize principal models in property valuation services and to verify whether there is specialization in property valuation business in Poland. The empirical approach has been matched to find patterns in the professional activities of appraisers, above all concerning the type and scope of services and clients served.

The problem taken up in this article is substantial and contemporary, both for academic discussion and business practice. Our research fills the gap in the current literature on the market of real estate valuation services and is a valuable contribution to further studies. We believe that the results will be interesting for educational institutes as well as regulators and professional standards committees, becoming a valuable input in introducing future regulation in this field.

2. Literature review

The company's development strategy is created under specific internal and external conditions. Analyzing the strategies of successful enterprises, one can infer that, in many cases, they owe their success to one of two commonly identified development paths - specialization or diversification (SMUTEK 2003). Companies using the strategy of specialization focus on acquiring the highest level of skills in one field of activity, as well as its development and improvement in order to achieve a competitive advantage in this field. In turn, organizations using the strategy of diversification undertake efforts to extend their existing area of activity. This may be achieved by extending the scope of services, gaining new business partners, increasing the spatial extent of operations, implementing different methods of production, etc. (ANSOFF 1965; CHANDLER 1962; PIERŚCIONEK 1992; PORTER 1992; RAJZER et al. 2001).

Although these strategies are originally derived from production enterprises, they have been successfully implemented by companies offering professional services (SHERER 1995, GREENWOOD et al. 2005). The results of previous studies prove the relationship between specialization and company performance. The strategy of specialization is mainly carried out in the field of knowledge-based advisory services focused on solving a specific problem with high professional autonomy. For example, the specialization strategy is often noted in legal services (BECKER et al. 2001; GARICANO, HUBBARD 2007, 2009; MOORHEAD et al. 2010) and in the audit firm industry (DUNN and MAYHEW 2004; BILLS, JETER, STEIN 2015; AUDOUSSET-COULIER et al. 2016).

According to Greenwood et al., the strategy of diversification in professional service firms is also implemented, but will be successful only if two conditions are met. First, the diversified portfolio must embrace only business core related services to avoid incoherent company activities. The second condition for successful diversification is that it should be balanced, involving serious resource investments in all services offered in order to convince clients that the firm is equally qualified across its portfolio (GREENWOOD et al. 2005).

In the area of real estate valuation, the quality of service gains special importance, which, in this case, is the result of the knowledge, experience, credibility and responsibility of the people providing the services. Undoubtedly, real estate valuation belongs to a group of so-called professional services (THAKOR, KUMAR 2000; CHŁODNICKI 2004; MAISTER 2010; NORDENFLYCHT 2010), which has an advisory character with a high degree of individualization. The professionalism of appraisers is closely related to the scope of specialization of the services provided.

Specialization of real estate valuation services usually means narrowing the scope of activity. This happens when services are limited to a particular customer groups or selected types of real estate. Diversification in the area of property valuation services is driven by expanding the areas of specialization acquired so far and increasing the spatial coverage of valuations. Based on research on the professional activity of property appraisers in other countries, two main areas of service specialization can be identified - by the type of property valued and type of client with whom they cooperate (examples from various countries: Czech Republic and Hungary - MANSFIELD, ROYSTON (2007), Australia - WILKINSON, ANTONIADES, HALVITIGALA (2018), France - PLIMMER, GRONOW (1991), Portugal - DOS SANTOS REIS et al. (2002), Sweden - BELLMAN, LIND (2018)). It is worth mentioning

that companies running real estate valuation services also add new, complementary areas of professional activity. However, these kinds of services, apart from real estate valuation, are not taken into consideration as diversification in a strict sense.

Real estate appraisal services in Poland are conditioned by a number of legal regulations. These formalize the role of an appraiser in various procedures implemented in the real estate market and impose the methodology of valuation depending on the types of real estate, calculated value, market data availability and the purpose of the valuation. Such strong interference of legal provisions in the area of professional activity of property appraisers causes Polish appraisers to categorize their services in terms of clients, valuation objects and valuation purposes (PODMIOTY 2008; UHRUSKA 2009).

All the studies mentioned above make an unquestionable contribution to the understanding of general issues related to specialization. However, none of this research is directly focused on specialization in the property appraisal business. There is also a lack of similar research in Poland. Thus, this paper fulfills the identified gap, delivering unique and original data about specialization in property valuation services.

3. Data and Methods

This paper aims to detect relatively homogeneous groups of property appraisers taking into consideration the scope of services performed by them and types of clients served. By assessing the coexistence of a particular kind of valuation services usually carried out by the researched group of respondents, it will be possible to highlight major models in property valuation services settled by the observation of business practices and verify the thesis regarding specialization in doing business in property valuation.

The data set used in this research comes from surveys conducted in 2018 as a part of statutory research at the Department of Real Estate Economics and Investment Process at the Cracow University of Economics, which were focused on detecting the institutional and economic conditions of running a business in the area of real estate services (MAŁKOWSKA, UHRUSKA 2018; KANIA, KMIEĆ 2018; NAJBAR, WĘGRZYN 2018). Property appraisers from all over Poland were asked to fill out questionnaires covering a wide range of issues important to the valuation profession. The data was gathered from practitioners belonging to professional associations of property appraisers throughout the entire country. In most cases, the survey was conducted via an online platform, except for a few questionnaires filled out in traditional, paper form. The overall research sample contains 411 completed questionnaires; however, after the removal of the responses containing deficiencies, 289 observations were finally adopted for the analysis.

A significant part of this survey referred to the problem of the scope of valuation services commonly done by respondents and their involvement level in the property appraisal business. The survey asked if property valuation is (i) the only professional activity of the respondent, (ii) the main, but not the only, profession or (iii) an occasional job. An important element in the study of specialization in the performance of professional activities is the identification of the territorial coverage of the services offered. Respondents determined the spatial range of routine valuations, indicating whether they are limited to (i) the nearest area (nearby administrative districts – Polish “poviats”), (ii) the voivodship, (iii) region (nearby voivodships), or accept orders covering (iv) the entire country. Another set of questions made it possible to distinguish the frequency of valuation types carried out, according to the (i) valuation object, (ii) valuation purpose, and (iii) client types. The answers were provided on a 5-point Likert scale, which allowed for the measurement of the majority of variables tested according to an ordinal scale. The frequency of conducted valuations was defined as follows: 1 (never), 2 (rare), 3 (average), 4 (often), 5 (usually).

A list of variables used in the analysis was divided into groups of respondents according to the territorial extent of valuation services as well as to the level of engagement in the professional activity. The descriptive statistics for respondents’ answers belonging to these groups along with statistical tests on mean differences between the groups are covered in Table 1. The first column contains a list of variables referring to property valuation and customer types. The second includes descriptive statistics of all responses (289); subsequent columns report mean responses for identified groups of respondents with the results of statistical tests on mean differences between groups.

To examine the survey data, we use cluster analysis. In scientific research, cluster analysis is dedicated to determining the natural groupings (clusters) of observations and/or variables. Different

kinds of cluster analysis methods have been intensively applied in many areas of scientific research, wherever the classification of data provide a new look into the studied phenomenon (to find examples of the use of cluster analysis see EVERITT et al. (2011) and GORDON (1999)). It has also found an application in the area of real estate studies (e.g. WHIPPLE 1995; O'ROARTY, MCGREAL, ADAIR 1998; LANGTON, SONG, PURDEY 2008; THOMSON et al. 2013).

In short, cluster analysis is a multidimensional statistical technique that allows for the division of a large group of objects into smaller and more homogeneous groups (clusters) (REIFF et al. 2016). Thus, it is possible to recognize the similarity of the structure of objects and the identification of structure types through the characteristics describing objects in separate groups (MALINA 2004). Cluster analysis offers two general types of methods: hierarchical and partition. Hierarchical methods of clustering fall into two categories: agglomerative (bottom-up) and divisive (top-down). In practice, agglomerative methods of hierarchical grouping start from each observation being treated as a separate group; then, the closest two groups are combined, and this process continues until all observations will belong to the same group. Differentiation in the agglomeration methods and disparity in the outcomes of cluster analysis are caused by the various manners of joining individual cluster pairs and the distance formulas used in clustering. Opposite to hierarchical agglomerative clustering, divisive hierarchical clustering begins with all observations belonging to one group and then splitting it into two groups, and so on until all observations create their own separate groups. In turn, partition methods of clustering divide observations into a separate number of non-overlapping groups. They require a decision to be made, a priori, regarding the number of clusters (k) which are created by using an iterative process. The most popular partition methods are k-means and k-medians.

Our research strategy approach is twofold: in order to find what the general models of business extent area and to provide the answer to whether or not appraisers specialize in valuation services, we follow a two-step procedure. First, we use the agglomerative cluster method to divide the types of valuation services and appraisers' clients (variables) to find groups of similar valuation services, representing the main models of business extent in property appraisals. We also verify these results by using k-means cluster analysis. Second, we apply k-means partition methods to find relatively homogenous groups of respondents, taking into consideration the frequency of carrying out particular types of valuations and clients served.

Table 1

The average frequency of valuation types carried out by respondents – survey results¹

VARIABLES		SPATIAL COVERAGE OF VALUATION SERVICES						FORMS OF APPRAISERS' INVOLVEMENT IN VALUATION				
		Total respondents (obs = 289)	Neighboring poviats (obs = 111)	One voivodship (obs = 68)	Region (obs = 43)	Poland (obs = 67)	Kruskal-Wallis ANOVA by Ranks	Sole professional activity (obs = 168)	Basic, but not a sole professional activity (obs = 61)	Additional professional activity (obs = 60)	Kruskal-Wallis ANOVA by Ranks	
		Mean*	Std. Dev	Mean	Mean	Mean	Mean	ANOVA results	Mean	Mean	Mean	ANOVA results
V1	VALUATION OBJECT - RESIDENTIAL UNITS	3.70	1.04	3.83	3.75	3.77	3.40	[F(3, 285) = 5.96, p=0.1135]	3.83	3.49	3.55	[F(2, 286) = 6.81, p=0.0332]
V2	VALUATION OBJECT - COMMERCIAL UNITS	2.83	0.94	2.62	2.91	2.86	3.07	[F(3, 285) =11.71, p=0.0084]	2.86	2.87	2.70	[F(2, 286) = 1.19, p=0.5504]
V3	VALUATION OBJECT - LAND FOR DEVELOPMENT	3.90	0.82	3.79	3.99	4.12	3.85	[F(3, 285) = 4.49, p=0.2132]	3.93	4.00	3.72	[F(2, 286) = 3.38, p=0.1841]
V4	VALUATION OBJECT -	3.85	0.89	3.86	3.96	4.07	3.60	[F(3, 285) = 7.90,	4.02	3.67	3.57	[F(2, 286) = 13.08,

	BUILT-UP LAND WITH A RESIDENTIAL BUILDING							p=0.0481]				p=0.0014]
V5	VALUATION OBJECT - BUILT-UP LAND WITH A NON- RESIDENTIAL BUILDING	3.10	1.00	2.69	3.16	3.28	3.60	[F(3, 285) = 38.62, p=0.0000]	3.13	3.28	2.83	[F(2, 286) = 6.25, p=0.0439]
V6	VALUATION OBJECT - AGRICULTURA L OR FOREST LAND	2.57	1.03	2.45	2.56	3.05	2.49	[F(3, 285) = 8.79, p=0.0322]	2.62	2.74	2.28	[F(2, 286) = 6.77, p=0.0339]
V7	VALUATION PURPOSE - LOAN SECURITY	3.70	1.14	3.88	3.53	3.53	3.66	[F(3, 285) = 6.42, p=0.0927]	3.86	3.52	3.42	[F(2, 286) = 8.73, p=0.0127]
V8	VALUATION PURPOSE - MARKET SALE	3.42	1.03	3.32	3.37	3.77	3.42	[F(3, 285) = 6.18, p=0.1030]	3.41	3.39	3.48	[F(2, 286) = 0.30, p=0.8621]
V9	VALUATION PURPOSE - PUBLIC REAL ESTATE SALE	2.53	1.21	2.45	2.51	2.98	2.39	[F(3, 285) = 6.40, p=0.0935]	2.51	2.59	2.53	[F(2, 286) = 0.18, p=0.9141]
V10	VALUATION PURPOSE - SETTING AND UPDATING OF PERPETUAL USUFRUCT FEES	2.26	1.06	2.05	2.38	2.65	2.25	[F(3, 285) = 12.64, p=0.0055]	2.27	2.31	2.20	[F(2, 286) = 0.63, p=0.7281]
V11	VALUATION PURPOSE - BETTERMENT LEVY (ADJACENT FEES) AND/OR PLANNING FEES	1.98	1.03	1.92	2.10	2.09	1.88	[F(3, 285) = 2.96, p=0.3978]	1.97	2.03	1.95	[F(2, 286) = 0.77, p=0.6800]
V12	VALUATION PURPOSE - EXPROPRIATIO N	2.03	1.11	1.79	2.09	2.47	2.09	[F(3, 285) = 13.61, p=0.0035]	1.95	2.25	2.03	[F(2, 286) = 3.02, p=0.2204]
V13	VALUATION PURPOSE - DIVISION OF PROPERTY	2.81	1.09	2.75	3.04	2.79	2.69	[F(3, 285) = 5.88, p=0.1174]	2.96	2.79	2.42	[F(2, 286) = 11.06, p=0.0040]
V14	CLIENTS - INDIVIDUAL	3.40	1.10	3.64	3.24	3.30	3.22	[F(3, 285) = 8.87, p=0.0311]	3.46	3.30	3.33	[F(2, 286) = 1.12, p=0.5714]
V15	CLIENTS - ENTREPRENEU RS (EXCEPT FOR DEVELOPERS AND BANKS)	3.15	1.04	2.85	3.19	3.23	3.57	[F(3, 285) = 22.31, p=0.0001]	3.23	3.21	2.87	[F(2, 286) = 5.32, p=0.0701]
V16	CLIENTS - BANKS AND FINANCIAL INSTITUTIONS	2.74	1.22	2.62	2.75	2.74	2.93	[F(3, 285) = 3.07, p=0.3812]	2.90	2.72	2.32	[F(2, 286) = 11.48, p=0.0032]
V17	CLIENTS - DEVELOPERS	2.16	1.06	1.82	2.32	2.12	2.57	[F(3, 285) = 8.24, p=0.0000]	2.21	2.26	1.90	[F(2, 286) = 5.43, p=0.0663]

V18	CLIENTS - COURTS	2.42	1.41	2.15	2.56	2.56	2.64	[F(3, 285) = 7.93, p=0.0475]	2.52	2.59	1.97	[F(2, 286) = 8.63, p=0.0134]
V19	CLIENTS - BAILIFFS	2.08	1.28	1.88	2.29	2.26	2.09	[F(3, 285) = 6.93, p=0.0740]	2.17	2.16	1.75	[F(2, 286) = 7.61, p=0.0222]
V20	CLIENTS - THE STATE TREASURY AND/OR LOCAL GOVERNMENT UNITS	2.76	1.35	2.65	2.79	3.19	2.63	[F(3, 285) = 5.45, p=0.1416]	2.69	2.89	2.82	[F(2, 286) = 1.08, p=0.5823]

* The mean of answers in the 5-point Likert scale: 1 (never), 2 (rare), 3 (average), 4 (often), 5 (usually)

¹The table shows the average frequency of valuation types (relating to valuation objects, valuation purposes, and client types) according to responses of extracted groups of respondents with statistical tests on mean differences between groups. A mean level of over 4 generally indicates that the particular type of valuation, by averaging results, is done very often. The reverse situation, i.e. if the mean results are around 1, signals that the specific type of appraisal is never or rarely carried out in this group of respondents.

Source: own study.

4. Empirical results

4.1. Initial analysis of the diversification of property appraisers' activities – survey results

As mentioned before, the analyzed part of the survey covered three groups of questions about: (i) the territorial extent of valuation services usually provided by the respondents, (ii) the forms (level) of appraisers' involvement in the valuation business, (iii) the regularity of particular types of valuation services usually carried out by respondents and frequency of specific types of clients served. The third group of questions included a total of twenty valuation categories (variables), the first six characterize different valuation objects, the next seven relate to different valuation purposes and the last seven - to different types of clients. Answering these questions, respondents pointed out the frequency of carrying out each kind of valuation on a 5-point Likert scale. Table 1 presents the descriptive statistics of the answers and ANOVA statistical tests on mean differences between groups. The highest mean values, calculated based on the answers of all analyzed respondents (Column 3), show that the most frequently valued objects are: residential units, land for development, built-up land with residential buildings, built-up land with non-residential buildings. The most commonly valued purposes are: loan securities and market sales. Among clients most frequently served are: individuals (households) and entrepreneurs (except for developers and banks).

Analyzing the same answers within seven categories - four differentiating the spatial scope of valuation services and three describing distinct forms of involvement in the valuation business, we can conclude that, in some cases, there are significant statistical differences in the mean measure results between extracted groups of respondents (Table 1). Regarding the spatial extent of valuation services, we can observe that appraisers working locally most often serve individual clients. On the contrary, appraisers who operate on a broader area - regionally or nationally, most often cooperate with the institutional clients such as entrepreneurs, developers, and courts. The same applies to certain types of valuation objects and valuation purposes. Professionals accepting orders from various parts of the country as compared to appraisers acting locally more often estimate the value of commercial units, built-up lands, agricultural or forest land, as well as dealing relatively frequently with exceptional kinds of valuation purposes - such as perpetual usufruct fees and expropriations.

The second classification factor is the scope of involvement in the valuation business. The first group of respondents performs valuations as the sole professional activity. The second group of respondents treats valuations as a primary job but expands the range of business by offering additional services, such as property management, real estate brokerage, investment consulting, market analysis, legal advice, services in constructions and others. For the last group of respondents, doing valuations is an additional source of income. Concerning the level of involvement in the valuation business, we find that appraisers who are solely involved in the valuation business, more often deal with almost all types of valuations and clients compared to those professionals, who treat property appraisals as an additional job. For instance, people who do property valuations as an extra

job rarely (some of them never) provide services for such clients as banks, courts, and bailiffs.

4.2. Finding similarities in valuation services - cluster analysis results

We have begun searching for patterns in the scope of the property valuation business from the clustering of twenty previously analyzed variables, first by using the agglomerative method. The dendrogram presents the grouping of outcomes for property valuation types and clients using Ward's method and Euclidean distance.

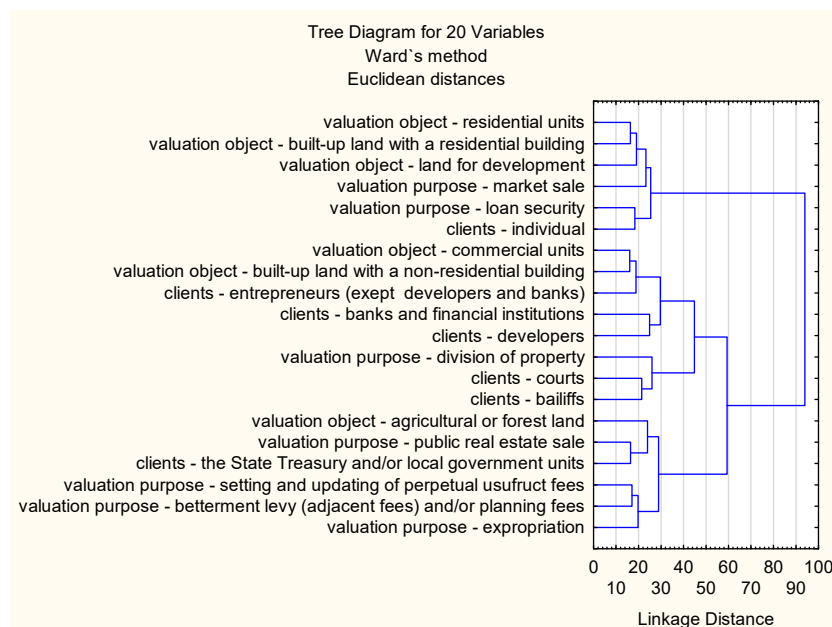


Fig. 1. Dendrogram for property valuations and customer types based on agglomeration cluster analysis. *Source:* own study

The tree diagram shows two general groups of similar variables, the first may be described as a housing valuation cluster and the second includes the other types of property valuations. If we look more closely into the second group, we can see that, within it, there are two or three additional clusters. One of them addresses commercial valuations, the next comprises public property valuations, and the final- smallest one - contains judicial valuations (Figure 1). According to the results obtained from hierarchical clustering, we picked $k=4$ to run cluster analysis using the k-means method. The outcomes of k-means clustering have been presented in Table 2.

Table 2

Objects of clusters by k- means cluster analysis method ($k=4$)

Cluster no. 1	Cluster no. 2
valuation object - residential units	valuation object - commercial units
valuation object - land for development	valuation object - built-up land with a non-residential building
valuation object - built-up land with a residential building	clients - entrepreneurs (except developers and banks)
valuation purpose - loan security	clients - banks and financial institutions
valuation purpose - market sale	clients - developers
clients - individual	
Cluster no. 3	Cluster no.4
valuation purpose - division of property	valuation object - agricultural or forest land
clients - courts	valuation purpose - public real estate sale
clients - bailiffs	valuation purpose - setting and updating of perpetual usufruct fees
	valuation purpose - betterment levy (adjacent fees) and/or planning fees
	valuation purpose - expropriation
	clients - the State Treasury and/or local government units

Source: own study.

We received four clusters combining valuations and client types based on their similarity, which reflect the models of property valuers' activity as follows:

(Cluster No. 1) *market-oriented housing valuation model* - focuses mostly on residential properties and land for development, valuations are conducted for market purposes, often sale and loan security for individual clients;

(Cluster No. 2) *market-oriented commercial valuation model* - focuses mostly on commercial units and non-residential properties and land valuations for entrepreneurs, banks and financial institutions and developers;

(Cluster No. 3) *non-market-oriented judicial valuation model* - supports litigation solutions. The primary purpose of these valuations is the division of property, which is strictly linked with clients to whom these services are delivered - courts and bailiffs.

(Cluster No. 4) *non-market-oriented public valuation model* - associates public properties, public purposes, and public clients. The one exception in this group is agricultural or forest land valuation; however, this kind of valuation model is often connected to the municipal government needs of valuation.

These results coincide entirely with the previous agglomerative grouping outcomes. Moreover, they support an intuitive point of view on the functioning of the valuation service industry providing empirical evidence on the direction of property appraisers specializations in Poland.

4.3. Finding similarities in analyzed sample of property appraisers - cluster analysis results

To answer the question regarding property appraisers' specialization in Poland, we applied k-means cluster analysis to discover relatively homogenous groups of respondents, taking into consideration the frequency of carrying out, previously described, types of property valuations and clients served. We run an analysis for total observations (respondents). Four relatively homogenous groups of professionals are presented in Table 3. Each extracted cluster is described by the mean frequency of the particular types of valuations according to the respondents' declarations. To interpret the results, we take into consideration the mean level of a particular sort of valuation's frequency and its interpretation according to the Likert scale, as well as comparing those mean levels between groups.

Cluster No. 1, covering 61 out of 289 respondents, brings together real estate appraisers characterized by a wide range of activities and the highest frequency in valuing all types of real estate. This group cooperates with corporate and institutional clients, in particular with entrepreneurs, banks, and developers. They also serve individuals and appraise residential properties. The primary purposes of valuations are loan security and market sales. Thus, because of the broadest scope of services offered, this group links all-round appraisers with **no clear specialization profile**. However, it is worth noticing that, compared to others, these professionals relatively often appraise commercial real estate as well as cooperate with institutional clients.

Cluster No. 2, including 60 respondents, contains property appraisers quite often dealing with all types of real estate, mainly to support litigation solutions. They carry out appraisals mainly for the purpose of property division. Dominating clients for this group of professionals are courts and bailiffs. Their specialization may be referred to as a *non-market-oriented judicial valuation model*.

Cluster No. 3, with 60 respondents, can be described as a group of property appraisers often dealing with valuations for public purposes like a public real estate sale, setting and updating of perpetual usufruct fees, betterment levies (adjacent fees), planning fees and expropriation. Generally, they provide services for the State Treasury and local government units. Their specialization type refers to a *non-market-oriented public valuation model*.

Cluster No. 4, is the largest group. It contains 108 respondents, who carry out valuations for loan security more often than others, and quite often for the purposes of market sale. They usually cooperate with individual clients by valuing residential units. The type of their specialization may be described as a *market oriented-housing valuation model*.

Evaluating the results of cluster analysis, we can see some differences in the directions of valuations performed by the surveyed appraisers. Our interpretation is based mainly on the features that most distinguish each cluster. We find evidence of specializations within the professional activity. Although the differences in the frequency of a particular types of valuations declared by respondents concentrated within the four clusters are quite explicit, does not change the fact that most of the appraisers offer a wide range of valuation services and serve all kinds of clients.

5. Discussion and conclusions

This article aims to examine whether there is a specialization of services in the professional activities of property appraisers in Poland and what type of specialization models we can observe. Based on the survey results conducted in 2018 and covering the answers of property appraisers from all over Poland to a questionnaire regarding a wide range of issues connected to valuation profession, it was possible to pinpoint the major models in property valuation services and to verify the thesis regarding specialization in the business of property valuation.

Table 3

Appraisers' grouping and cluster specification by k-means cluster analysis method (k=4)

Variable	Cluster Means				ANOVA					
	Cluster No. 1	Cluster No. 2	Cluster No. 3	Cluster No. 4	Between	df	Within	df	F	signif.
	Obs = 61	Obs = 60	Obs = 60	Obs = 108						
valuation object - residential units	4.16	2.52	2.4	2.81	52.26	3	204.43	285	24.28	0,000
valuation object - commercial units	3.59	3.68	4.17	3.69	18.69	3	173.4	285	10.24	0,000
valuation object - land for development	4.23	3.57	3.43	3.96	31.51	3	195.09	285	15.35	0,000
valuation object - built-up land with a residential building	4.34	3.03	2.78	2.91	41.88	3	246.21	285	16.16	0,000
valuation object - built-up land with a non-residential building	3.82	2.52	2.82	2.1	54.02	3	250.63	285	20.47	0,000
valuation object - agricultural or forest land	3.23	2.77	2.73	4.45	185.74	3	189.46	285	93.13	0,000
valuation purpose - loan security	4.21	2.77	3.47	3.54	36.96	3	267.53	285	13.13	0,000
valuation purpose - market sale	3.82	1.88	3.55	1.85	179.27	3	240.73	285	70.75	0,000
valuation purpose - public real estate sale	3.36	2.07	3.2	1.61	111.93	3	212.08	285	50.14	0,000
valuation purpose - setting and updating of perpetual usufruct fees	2.69	1.62	2.82	1.4	105.68	3	202.19	285	49.65	0,000
valuation purpose - betterment levy (adjacent fees) and/or planning fees	2.54	1.9	3.1	1.39	116.94	3	237.78	285	46.72	0,000
valuation purpose - expropriation	2.25	3.35	2.1	2.56	77.9	3	264.63	285	27.96	0,000
valuation purpose - division of property	3.43	2.72	2.57	3.94	118.04	3	231.2	285	48.5	0,000
clients - individual	3.93	2.92	2.52	3.29	52.85	3	256.46	285	19.58	0,000
clients - entrepreneurs (except developers and banks)	3.77	2.15	2.05	3.17	84.72	3	346.81	285	23.21	0,000
clients - banks and financial institutions	3.25	1.8	1.75	2.29	35.6	3	288.39	285	11.73	0,000
clients - developers	2.67	3.83	1.85	1.49	274.21	3	298.29	285	87.33	0,000
clients - courts	3.25	3.1	1.47	1.51	143.99	3	330.01	285	41.45	0,000
clients - bailiffs	2.7	2.03	4.48	1.83	328.37	3	198.67	285	157.02	0,000
clients - the State Treasury and/or local government units	3.41	2.52	2.4	2.81	52.26	3	204.43	285	24.28	0,000

Source: own study.

Firstly, it was assessed whether the manner of conducting professional activity, in terms of the territorial extent of valuation or the level of engagement in a professional activity, diversifies the type or frequency of appraisals carried out by respondents. It turns out that the measurements of the average frequency of valuation types in these groups reveal some significant differences. Increasing the territorial scope of professional activities and combining them with other professions may be recognized as a diversification strategy of doing business. We find that appraisers accepting orders with less territorial limits also deal with more demanding clients and business cases. We can

formulate a similar conclusion regarding the second splitting criterion, i.e. the level of engagement in a professional activity. Property appraisers who treat this job as an additional source of income and carry out valuations occasionally rarely cooperate with demanding clients like entrepreneurs, developers, courts or bailiffs. However, due to the lack of a sharp diversity of activities of the above groups, in further analysis, we decided to search for the evidence of specialization in the appraisers' business based on total respondents, not within previously extracted sub-groups.

In turn, to find the answer to whether or not appraisers specialize in valuation services and what the general models of professional activity are, two methods were applied. Firstly authors used the agglomerative cluster method and k-mean method to divide the types of valuation services and appraisers' clients in order to find groups of similar valuation services and represent the main models of a business path in property appraisals. As a result, four clusters combining valuations and client types based on their similarity and coexistence were distinguished. They reflect the models of property valuers' activity, such as (1) a market-oriented housing valuation model, (2) market-oriented commercial valuation model, (3) non-market-oriented judicial valuation model, and (4) non-market-oriented public valuation model.

Secondly, the k-means partition method was applied to find relatively homogenous groups of respondents taking into consideration the frequency of carrying out the particular types of valuations and clients served. As a result, we received four clusters indicating three main directions of professional specialization in the area of valuation in Poland as well as a group of all-round appraisers with no clear specialization profile. These findings are partially in line with the results of the first stage of the analysis.

By conducting the research, it was possible to confirm the presence of specialization in real estate valuation services in Poland, which concerns a significant percentage of professionals, although not all of the surveyed appraisers. In general, property appraisers are diversified mostly by the purpose of the valuation and client type. Identified clusters reflect the areas of the professional activity of appraisers oriented towards supporting either market or non-market transactions. Among market transactions, primary valuation purposes are a market sale and loan security, usually ordered by banks, developers, entrepreneurs, and individual clients. According to the type of property appraised, professional activity fields may concern both groups of properties – housing and commercial real estate. In turn, the valuation services provided in order to support non-market transactions are usually ordered by the courts for litigation solutions and by public entities for public asset management purposes and fiscal matters.

Although the areas of specialization of valuation services are evident, they are indeed not the sole type of services provided by respondents. For profit, most surveyed professionals indicate a wide range of valuations, for different properties, purposes and clients. Areas of specialization usually appear over time as a result of gaining knowledge, acquiring satisfied clients and achieving professional experience.

Finally, our results should be regarded as substantial for the Polish valuation industry. Firstly, we believe that the results will be interesting for academic and educational institutes responsible for educational requirements and the training offered to current and future property appraisers. Secondly, for regulators and professional standards committees, knowledge regarding the specialization of real estate valuation services may become a valuable input in introducing future institutional and legal regulations. Thirdly, the results of our research may be interesting to valuers themselves in managing their business strategy and finding the potential areas of their competitive advantage.

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