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Mass evaluation pilot study as investment courage

Abstract:

Mass appraisal directly depends on the quality, transparency, and efficiency of spatial planning, cadastre, and land registry records. Recent practice shows that the fair mass appraisal or evaluation systems are intended to reduce the investment risks and encourage investment climate and banks as well as other financial organizations to offer affordable financing options. In Croatia, there are initiatives to introduce such a system, but the infrastructure is not sufficiently developed to make the system in its full value. Regardless, the existing database is the most relevant for apartments, which can be analyzed as the starting point for such consideration. The authors theoretically describe basis and readiness for applying mass evaluation in Croatia, as well as its international models and experiences. The greatest benefit for investment courage would be widening mass evaluation on each type and location of buildings, but there is lots of research for choosing the right methodologies, prototypes, and impact factors to find any application in the real sector. Respecting this fact, this paper gives pilot study for further discussions and for defining new challenges regarding the theme. The main contribution of the paper is a proposed model and opportunities for mass evaluation of residential apartments and its impact on the investment climate in Croatia.

Keywords: *mass appraisal; investment climate; investment courage*

1. Introduction

It is well known that the stability of regulations, entrepreneurship, and the real estate market contribute to health progress and development of each country and promote investment activities. While Croatia is in the 74th place out of 138 regarding the Global Competitiveness Index (WEF, 2016), the most problematic factor for doing business is insufficient government bureaucracy and tax rates. The real estate market is one of the most important issues that can stimulate and awaken an economy but can also chase investors to other locations. The most worrisome fact is that lost and missed opportunities for encouraging investments are almost impossible to calculate. On the other hand, knowing the state of the real estate market, monitoring and managing it with the ambitious behaviour of clients and investors could be fundamental for appropriate planning at the national level. It could boost competitiveness and, if not increase the interest of investors, at least reduce investors running away.

Mass appraisal (MA) is the process of valuing a group of properties as of a given date and using common data, standardized methods, and statistical testing (IAAO, 2013). MA has long been used in many developed member states of the European Union. The main purpose of MA is to determine the market value of the property as a basis for resolving property taxes. Each country builds the property tax system in a specific way, but it is essential that such a

system is in line with modern democratic and civilizational achievements. In other words, it is crucial to establish fundamental pillars of social morality: reciprocity or fairness (fair treatment) and empathy or compassion (protection of the weaker).

The morality of property tax can only be achieved if the market value of the property is used as the basis for it. Consequently, one who owns the most valuable property pays a higher tax. Regarding the earlier research results (UN Habitat, 2013), where 42 European countries were analyzed, only three (Ukraine, Poland, and the Czech Republic) use the property area as a dominant factor in calculating the tax base, not counting the countries that didn't have a certain property tax. Croatia doesn't have a practice of mass evaluation to this day, while the property tax system has recently been introduced (ZLP, 2016). This proposed system is based on the property area and doesn't fall into fair property tax systems, at least not according to the theoretical and practical known methodologies. However, according to an announcement from the Ministry of Finance, this is an interim solution that should be replaced by 2020 with a market-based system. Meanwhile, all organizational preparations should be carried out; quality property data should be provided, and the MA method (ZPVN, 2015) should be adopted.

Property taxes are not the only purpose of MA. There are many other reasons for implementing MA, such as: for estimating the real market value of property when applying for determination of ad valorem tax, for preliminary estimation of the market value before and during the sale, when assessing credit potential of the real estate portfolio or preliminary estimation of credit potential for individual real estate, for the purpose of estimating property insurance, etc.

Regardless of the MA purpose, there must be a sufficient amount of quality real estate data as a precondition for MA implementation. The procedure of selecting, data recording, and data logging is, therefore, crucial for preparedness. The paper will emphasize and select the necessary data to achieve required results. Also, a comparative analysis of the conducted research in Mostar (Žujo et al., 2013) and research for the purpose of this paper was carried out.

2. State of the art and practice

There have been many types of research and practice about MA techniques and practice (see Table 1). Today's trend is directed towards developing and applying more efficient and sophisticated hybrid techniques, which allows overcoming the shortages of the existing techniques and results that are result oriented more than ever.

Table 1. Analysis of MA techniques (source: McCluskey and Anand, 1999)

Technique	Authors	Strengths	Weaknesses
Comparative method	Wiltshaw (1991)	Ease of use; intuitive; internationally accepted method	Lacks a firm methodological structure; subjective
Multiple regression analysis	Rosen (1974); Meacham (1988); Mark and Goldberg (1988); Fibbens (1995)	Based on valid statistical assumptions; industry benchmark	Problems relate to functionality, multicollinearity, and transparency; data-hungry

Adaptive estimation procedure	Carbone and Longini (1977); Renwick and Flaherty (1996)	Iterative curve tracking process	Lacks model transparency; data-hungry
Expert systems	Scott and Gronow (1989); Nawawi and Gronow (1991); Nawawi et al. (1997)	Based on knowledge elicitation; simulation of expertise	Lacks robustness; rigidity of models
Case based reasoning	Barletta (1991); O'Roarty et al. (1997)	Reasons from past cases; objectivity; explainability	Requires considerable data; limited software availability
Artificial neural networks	Borst (1992); Evans et al. (1992); McCluskey and Borst (1997); Lenk et al. (1997)	Excels at pattern recognition; identifies underlying trends	Stability of models; functional form; black box approach; data hungry
Abductive network models	Borst and McCluskey (1996)	Can capture complex Relationships within data	Limited explainability; functional form of model; Lack of transparency

MA is used worldwide as support for determining the annual property tax, the tax on the imputed rent that owner-occupiers of residential properties pay themselves as their own landlords (which is part of income tax), the tax on landlords with ten or more residential properties, the tax on residential properties not permanently occupied by the owner, inheritance tax, and the water system charges levied by polder boards. They are the basis for setting maximum rents for social housing and are also used by notaries, banks, and insurance companies for the prevention of mortgage and real estate fraud (Kuijper and Kathmann, 2015). For those purposes, there are two common MA-selecting techniques: the method that is related to the market value and method that is based on surface area of the property. It is generally accepted that the first one has an advantage because of fair distribution of the tax burden, according to the market value, rather than the size and the area of the property unrelated to its value on the market (Uhlir & Majčica, 2016). Furthermore, it is proven that mass valuations for value-based property taxes are an important part of creating a virtuous circle in which investors have access to reliable property market data, banks are willing to release capital tied up in property, and taxpayers recognize the legitimacy of the taxes they are required to pay (Grover et al., 2015).

Mass appraisal requires complete and accurate data, effective valuation models, and proper management of resources. Valuation schedules and models should be consistently applied to property data that are correct, complete, and up-to-date (Grover et al., 2015; IAAO, 2013; Uhlir & Majčica, 2016).

Many authors point out significant cost reductions and shortening procedures after MA application (Almy, 2015; Buzu, 2015; Grover et al., 2015; Kuijper & Kathmann, 2015). Regardless of differences in defining those benefits in detail, it definitely has a positive impact on transparency and investment climate. The analysis of some years of experience shows that the appearance of the mass valuation system of land and construction structures, which was originally associated only with the real property tax reform, stimulated the interest of the society, public, and municipal institutions in values estimated by mass valuation approach (Bagdonavicius & Deveikis, 2011).

There are three most referencing challenges concerning MA: modern technology that has to support its design and application, the market (in which MA operates), and people, whose decisions directly form values and create systems from bottom up. In the process of decision making, the customer usually behaves intuitively, which is certainly not the best way to solve his housing problems (Žujo et al., 2013). But it has to be included as reality in establishing an MA system as well.

3. Research

The main research question was: *What are criteria that impact decision making when buying a residential apartment for a living?* The target group was investors and real buyers of these particular properties in Zagreb. Therefore, research was conducted through Udruženje poslovanja nekretninama (engl. Real Estate Business Association), whose representatives randomly proposed five real estate agencies for participating.

There are 44 responses in total, equally distributed by each real estate agency. Respondents were real clients that are now in the buying process and trying to find appropriate residential apartments for their living purposes. The research was conducted by interviews with only one question to answer: *"What criteria (without numerical or any other limitations), in order of importance, are important for you when deciding exactly which property to buy?"* On average, there were eight respondents from each real estate agency.

All real estate agents were given the same guidelines, not to make suggestions to respondents in any way. All respondents were in the buying process of the apartment for the purpose of resolving the housing issue. So the type of property and the region (Zagreb) for all respondents were common.

There were, on average, five criteria per respondents (average was 5,3). Only one respondent listed eight criteria. The unlimited numbers of criteria enable assuming that the listed criteria for each respondent forms 100% of the decision impact factors when buying a residential apartment. In the end, there were 20 impact factors for decision making regarding buying the apartment and two main constraints that are common for 95% of respondents: the amount of investment or price and the orderly property documentation.

There is one impact factor that has two-way meaning: *the need for renovation*. Some respondents see it as an opportunity and some as a disadvantage. The need for renovation can be positive and directly related to lower property price, which is important, as predetermined constraint with usually no flexibility. Furthermore, its benefits are manifested in the ability to arrange flooring space, furnishings, and equipment according to their own needs. Those respondents who see need of renovations as a disadvantage are those who are more concerned with finding immediately available and ready-to-move-in solutions and are compensated at a higher price. Most commonly, it is associated with the flexibility of time that they have to find an adequate solution.

Very rare criteria (quality of construction, friendly neighborhood, and existence of funds for building maintenance) are neglected from further analyses, because only 2% of respondents mentioned them, and with low priority.

Determining the weight of each particular criterion was the first issue to consider with research-collected data. As the initial and fundamental part of research, it can be set up in

several methodological ways. The weight of the criteria was not in question for respondents, but the order of importance was.

The listed criteria were weighted by order of importance, assuming that the differences between the ranking criteria are determined by the number of criteria set and made 100% for each respondent separately. In other words, the ranked values are normalized to 100% by respondent. Weighted factors ($f(c_i)$) for each criterion are obtained as follows:

$f(c_i) = \frac{n+1-c_i}{1+2+..+n} * 100$, where:

$f(c_i)$ is the weighted factor for criteria c_i;

c_i is the listed criteria as a member of the whole set of proposed criteria by each respondent;

n is a number of proposed criteria by each respondent;

{c_1, c_2, …c_i, ..c_n}is set of proposed criteria of each respondent.

For each respondent, $f(c_1) + f(c_2) + \cdots + f(c_i) \ldots + f(c_n) = 100(\%)$. In this way, it is ensured that formulation follows the fact that each respondent gave the whole set of important criteria, which closes 100% impact factors for decision making.

4. Results and discussion

After coding and initial data processing, two main analyses were provided: comparison with earlier research results (Žujo et al., 2013) and the statistical analysis for conducted research results. During the coding and computing of statistical data, it was important to establish a system for weighting impact factors of the proposed criteria. Descriptive analysis of results was done at the beginning of the analysis (see Table 2).

Table 2. Descriptive analysis of factors (N=44)

	Maximum	Mean		Std. Deviation
	Statistic	Statistic	Std. Error	Statistic
Location	66,67	25,4791	2,21910	14,71984
Floor plan efficiency	40,00	17,3270	2,03689	13,51121
Elevator (if applicable)	30,00	8,2257	1,48649	9,86028
Adoptation need	30,00	6,9739	1,64499	10,91161
Terrace / Balcony	30,00	6,4661	1,22619	8,13365
Property age	33,33	5,8534	1,44342	9,57457
Close to public tranport	28,57	5,6870	1,40289	9,30575
Certain floor as condition	33,33	5,2814	1,41743	9,40214
Parking	20,00	3,1402	,98657	6,54417
Quantity of light	40,00	2,6841	1,24603	8,26525
Greenery proximity	20,00	2,3268	,79208	5,25404
Orientation	19,05	2,2889	,79247	5,25664
Warehouse space existence	20,00	1,7314	,69804	4,63026
Urban morphology	23,81	1,6466	,70975	4,70798

Close to main living facilities	20,00	1,5061	,73916	4,90304
Property size	26,67	1,0607	,74913	4,96918
Positive impression (good feeling)	23,81	1,0175	,63797	4,23182
Speed marketability	23,81	,9470	,66886	4,43672
Floor plan flexibility	10,71	,7032	,39706	2,63378
Heating solution	6,67	,3032	,21187	1,40542

4.1 Comparative analysis of earlier research

A comparison to an earlier survey conducted by Žujo et al. (2013) was made to answer the research question: *Are the criteria equal to the same types of properties in all geographic regions?*

Data collection method was the same for both surveys, and the identified criteria are classified into the analog criteria groups (CG), to ensure comparison possibilities.

In earlier research (Žujo et al., 2013), four main CG were identified (location, technical quality, architecture, and living comfort). After setting the same CG for conducted research (see Table 3), there were five criteria in the CG named Location, four criteria in Technical quality, eight criteria in Architecture, and three criteria in Living comfort.

Table 3. Criteria and their CG alignment

	Group of criteria			
	Location	*Technical quality*	*Architecture*	*Living comfort*
This research	Location Close to public transport Urban morphology Close to main living facilities Marketability speed	Elevator (if applicable) Need for adaptation Property age Heating solution	Floor plan efficiency Floor plan flexibility Terrace / Balcony Certain floor as condition Parking Greenery proximity Warehouse space existence Property size	Orientation Positive impression (good feeling) Quantity of light

Earlier research (Žujo et al, 2013)	Micro-location (city centre, other urban areas, suburban areas) The position of the building within the micro-location (traffic jam, traffic noise) Insolation (per individual rooms) Utilities Public area Neighbourhood (proximity of adjacent buildings, stories of adjacent buildings)	Construction type (monolithic, semi-prefabricated, prefabricated) Building materials (natural, artificial) Building equipment (lift, antenna system, multimedia networks, computer networks, video surveillance, alarm system, blinds) Building Elements (roof, facades, windows and doors, flooring) Heating, cooling, ventilation	Rooms in the apartment (number of rooms, layout, size of the rooms, isolation) Geographic location (population density, green areas) Number of stories (number of floors in the building, the location of the apartment in the building, number of floors in the apartment) Parking space (uncovered, covered, closed)	Sound insulation (sound in the air, sound in object) Thermal insulation Natural light (per individual rooms)

Before considering weight ratio of criteria in two different regions (Mostar in Bosnia and Herzegovina and Zagreb in Croatia), it is interesting to notice comparatively equal identified criteria. CG are deployed here according to comparative study, even if the criteria are not completely equal. The original aligning criteria into CG are not considered but are retrieved to obtain comparable results. Descriptive analysis of data from conducted research is given in Table 4.

Table 4. Descriptive analysis of CG

	N	Mean		Std. Deviation
	Statistic	Statistic	Std. Error	Statistic
Location	44	35,2659	2,34091	15,52784
Technical Quality	44	21,3561	2,35432	15,61681
Architecture	44	38,0368	2,72167	18,05353
Living comfort	44	5,9905	1,72903	11,46912
Valid N (listwise)	44			

It is evident that Location is evaluated similarly in both surveys (see Table 5). *Technical quality* is also very close (4%), while *Architecture* and *Living comfort* have greater differences concerning the opinion of respondents in two comparable regions. The first one has 18% greater weight of importance in the conducted research than in earlier research, while the second one shows 14% less importance than in comparable research. Overall, it can be assumed that the importance factors vary by regions and types of properties, which can be further explored by including more regions.

Table 5. Comparison analysis results

Group of criteria	Earlier research (Žujo et al., 2013) [%]	Conducted research [%]	Difference
Location	35	35	=
Technical quality	25	21	↓ 4%
Architecture	20	38	↑ 18%
Living comfort	20	6	↓ 14%

4.2 Interpretation of results

Interpreting the results begins with the crucial issue of applying the research results to the whole population. This concerns criteria weights to choose an appropriate residential apartment to buy, in the region of Zagreb in Croatia. The point (see Table 2) and interval evaluation of population mean are conducted. Data distributions are analyzed, after which, the appropriate statistical methods are chosen.

The smaller the standard error is, the more confidence we can have in the mean of the sample. The standard deviation of the population is never known, and therefore, the standard error is measured. So, the standard error of mean is obtained by standard deviation of sample and sample size. The standard error depends on the standard deviation of population and sample size, while its evaluation (of standard error) depends on sample parameters instead of population:

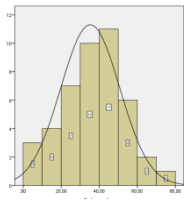
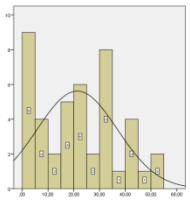
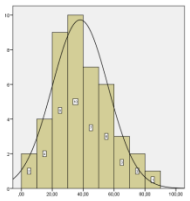
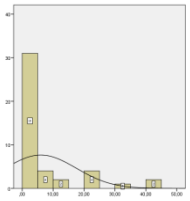
$$SE_m = \frac{s}{\sqrt{n}} \qquad (1)$$

Where SE_m is standard error of mean evaluation, S is standard deviation of sample, and *n* is the sample size.

Defining the interval of confidence is a precondition for determining the interval assessment of population mean. This interval is calculated as sample mean ± margin of error. The margin of error is a product of a certain quantization from Student's t-distribution and a standard error evaluation for the mean.

The choice of the interval of confidence depends on how much risk (α) is acceptable so as not to include in the interval. The most commonly used confident intervals are α=0,05 and α=0,01; 95% confidence interval is defined as $M \pm t_{0.975} * SE_m$; while 99% confidence interval is defined as: $M \pm t_{0.995} * SE_m$. The following table (Table 6) presents basic statistical data that can be used with 95% confidence to assess the mean of each CG in the population.

Table 6. Statistical analysis of criteria's confidence intervals and distribution

Group of criteria	Statistical parameter		Value
Location 	95% Confidence Interval for Mean	Lower Bound	30,5450
		Upper Bound	39,9868
	5% Trimmed Mean		35,2257
	Median		33,3300
	Variance		241,114
	Interquartile Range		14,29
	Skewness		-,122
	Kurtosis		,244
Technical quality 	95% Confidence Interval for Mean	Lower Bound	16,6082
		Upper Bound	26,1041
	5% Trimmed Mean		20,9681
	Median		20,0000
	Variance		243,885
	Interquartile Range		26,66
	Skewness		,103
	Kurtosis		-1,045
Architecture 	95% Confidence Interval for Mean	Lower Bound	32,5480
		Upper Bound	43,5256
	5% Trimmed Mean		37,6624
	Median		33,3300
	Variance		325,930
	Interquartile Range		23,93
	Skewness		,350
	Kurtosis		-,430
Living comfort 	95% Confidence Interval for Mean	Lower Bound	2,5035
		Upper Bound	9,4774
	5% Trimmed Mean		4,3953
	Median		,0000
	Variance		131,541
	Interquartile Range		7,92
	Skewness		2,009
	Kurtosis		3,189

It is shown that, with 95% certainty, the mean of the population for this sample is:

- Location, between 31 and 41;
- Technical quality, between 16 and 26;
- Architecture, between 32 and 43;
- Living comfort, between 2,5 and 9,4.

Those intervals mostly depend on the size of the sample and data distribution of criteria. Because of the nature of coding data, these numbers are weight values (in %) of decision-making impact criteria for buying a residential apartment in the region of Zagreb.

In order to select the appropriate statistical method for data analysis, it is necessary to verify the assumption of the data distribution normality for a population of the sample. Due to the recommended commonly known values and conditions (see Table 7), a Shapiro-Wilk's test was performed and proved that the all criteria in the sample are not normally distributed (see Table 8).

Table 7. Verifying the hypothesis of normality distribution tests

Required size of samlpe	Statistic	Value for rejecting the hypothesis
> 100	Standard skewness Standard Kurtosis	> 1,96
> 2000	Jarque-Berat stat.	> 6
> 1000	Lilieforsova mod. of Kolmogorov-Smirnovljev test	p < 0,05
> 30	Shapiro-Wilkov test	p < 0,05

Table 8. Shapiro-Wilk's test of normality

	Shapiro-Wilk	
	Statistic	Sig. (p)
Location	,974	,424
Technical_quality	,933	,013
Architecture	,969	,276
Living_comfort	,597	,000

Correlates between criteria were determined by Kendall's and Spearman's coefficients (see Table 9).

Table 9. Correlation results

			Location	Technical quality	Architecture	Living comfort
Kendall's tau b	Location	Correlation coefficient	1,000	-,205	-,234*	-,190
		Sig. (2-tailed)	-	,065	,033	,119
	Technical quality	Correlation coefficient	-,205	1,000	-,437**	-,032
		Sig. (2-tailed)	,065	-	,000	,790
	Architecture	Correlation coefficient	-,234*	-,437**	1,000	-,209
		Sig. (2-tailed)	,033	,000	-	,082
	Living_comfort	Correlation coefficient	-,190	-,032	-,209	1,000
		Sig. (2-tailed)	,119	,790	,082	-
Spearman's rho	Location	Correlation coefficient	1,000	-,295	-,320*	-,243
		Sig. (2-tailed)	-	,052	,034	,112
	Technical quality	Correlation coefficient	-,295	1,000	-,604**	-,046
		Sig. (2-tailed)	,052	-	,000	,765
	Architecture	Correlation coefficient	-,320*	-,604**	1,000	-,268
		Sig. (2-tailed)	,034	,000	-	,078
	Living_comfort	Correlation coefficient	-,243	-,046	-,268	1,000
		Sig. (2-tailed)	,112	,765	,078	-

* Correlation is significant at the 0.05 level (2-tailed)
** Correlation is significant at the 0.01 level (2-tailed)

Based on Kendall's and Spearman's coefficients, there is a monotone correlation between CG: Architecture and Technical quality. Concerning the individual criteria, related samples of Kendall's coefficient of Concordance are conducted (Kendall's W is 0,307) and suggested to reject the null hypothesis that there is no correlation between the series of criteria ranks.

Related samples of Kendall's coefficient of Concordance for CG are conducted and suggested also to reject the null hypothesis that there is no correlation between the series of CG ranks. (Kendall's W is 0,392; degree of freedom is 3; test statistic = 51,736). Each node of the figure shows the sample average rank (see Figure 1). In a pairwise comparison of sample distributions, there is a significant difference between criteria that are marked with the yellow color and a smaller difference highlighted with the black color.

Figure 1. Pairwise comparisons of the sample's distributions: Kendall's coefficient of Concordance

The hypothesis that the distributions of categories drawn above are the same has to be rejected. This means that, in deeper analysis of the results, those criteria that are highlighted black might have analog method for analysis, but others not.

4.3 Link between MA and investment courage

The conducted research and its implications are just the beginning of a long journey to achieve the main goal: to establish a transparent and objective system for mass valuation that has a comprehensive impact. It includes investment climate impact as well. It is a long-term effect, and it should be confirmed. The authors of this paper consider that the research focus of MA should be intensified for its impact on investment climate rather than only to tax policies and amounts.

Specifically, in Croatia, the first four most problematic factors for doing business are: inefficient government bureaucracy (I=20,8), tax rate (I=15,3), policy instability (14,2), and tax regulations (11,7), which come before corruption (I=9,4) and access to financing (I=6,2) (WEF, 2016). It is obvious that MA is directly related to the first four most problematic factors for doing business, which are not followed by the appropriate attention of researchers and practitioners.

4.4 Discussion

Buyers' preferences can only be found through conversation with them. The conducted survey, which didn't impose any restrictions to respondents, indicates crucial impact factors for residential apartment purchases. Not least, it also gave secondary indicators that tell us about respondents' education and the lack of information on residential apartments in official public records.

Considering buyers' education, there is the absolute absence of energy retention as the first place that stands out. According to the survey, no prospective buyer showed interest for the energy class of the residential apartment to buy. And at the same time, it is well known that this life decision (buying an apartment) is mainly related to long-term credit lending. It can be interpreted as more efforts needed for education about the energy efficiency of Croatian citizens and the lack of awareness, regardless of the efforts made so far. Particularly, this concerns also the quality of energy efficiency certification implementation.

Declarative commitment for building energy certification and absence of: (a) Quality assurance of energy certification system, (b) Verification of ownership of it in the process of property transactions, (c) Disallowance of property transaction without proceeding energy certification system, and (d) Including required details of energy certificate in documentation (e.g., in sales contracts, with marking the particular energy class, etc.) lead to results such as observed in the survey.

Furthermore, the final list of criteria is too modest. In this part, a national programme of excellence and culture of construction, called *Apolitika*, should play a major role. Poorly educated citizens don't encourage quality, for building as well for urban and housing issues, which impacts the society as the whole.

The chronic lack of real estate data in public records is a serious obstacle to MA as well as to good quality taxes and decisions of public administration. It is apparent that a large part of the identified criteria that are interesting to the residential apartment buyers (and affect the market value of properties) are not included in e-Nekretnine (official national database, eng. e-RealEstate). Creating this database was the result of cooperation with the Ministry of Finance – Tax Administration of Croatia. They have never given priority to collecting those data. A possible solution is available at the local level, where it would be necessary to supplement the properties' records and establish a high-quality system of collecting required data. It can be recommended for further population census to re-examine, design, and conduct questionnaires about properties, in accordance with best practice of developed countries. For collecting and prepearing the missing data, it is necessery to apply the principles of the project management (control of costs, quality, and deadlines) (Uhlir & Majčica, 2016).

It is clear that there is a need for a synergy of public administration and real estate market, as the inherited state is not appropriate for the demands of the modern economy and administration.

5. Conclusion

There is a set of criteria that are repeated minimally in two surveys in a different region (Mostar and Zagreb), which plays as a decision impact factor for buying residential apartments.

If the grouping of criteria into CG is kept from the comparative research of Žujo et al. (2013), then the impact factors and their weight for the region of Zagreb are Location (35%), Technical quality (21%), Architecture (38%), and Living comfort (20%). In section 4.2 of this paper, the certainty for those numbers regarding the whole population is discussed. The main constraint of this research is related to the sample size, which was taken into account in the analyses.

This paper pointed to the lack of public records on properties, the low educational level of citizens, and their awareness regarding real estate market. Both issues are first preconditions to stop inertia and to improve doing business indicators, as the main investor courage motivator.

Further research has to be conducted to improve given grouping criteria into CG and to spread the research results to other regions and property types. Also, research methodology of defining the relative importance of each listed criteria could be discussed further.

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