Applying Information Quantity Analysis to Sold Price of Real Estate

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Abstract. The register of real estate sold price can successfully inhibit investors from speculating illegally on the real estate market. Due to the advantages of conference and confidentiality of traditional questionnaires, the purpose of this study aims to investigate and compare the various factors that influence the sold price of real estate by means of Fuzzy Delphi Method. In addition, various professionals, including real estate marketers, university professors and relevant government officials, take part in the questionnaire for our analysis.

Keywords: Realestate deal · Register of sold price · Fuzzy Delphi Method

1 Introduction

The current study is aimed to investigate and analyze the various factors that influence the sold price of real estate by means of Fuzzy Delphi Method and in-depth interviews. In Taiwan, the real estate trade used to be off-the-books deal, which caused problematic tradings. Now, it is necessary to register and to announce the sold price when a deal of real estate is done. We will conclude and analyze the various factors by reviewing relevant literature, by employing Fuzzy Delphi Method, and by in-depth interviews with real estate representatives, professors and government officials. The findings will be of great significance to future research relevant to the trading of real estate and to the development and implementation of certain government laws and policies on real estate.

2 Literature Review

According to the Civil law, number sixty-six, in Taiwan, the definition of real estate: The meaning of real estate refers to the land itself and the constructions built on the specific territory. According to the Law of real estate agency management, the definition of real estate means the land itself and the constructions built on the specific territory, houses, and other transferable rights. Furthermore, according to the stock exchange law on real estate, number 4, item 1, the definition of real estate refers to land, remodeled buildings, roads, bridges, tunnels, railway, piers, parking lots and any constructions that

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are of value, and facilities that are set up on the land, but the buildings, facilities, and constructions become valueless if taken away from the land. In addition, the value of the land, that of the facilities, and that of the constructions become depreciated because of the deprivation of the land. Thus, these are what the real estate means.

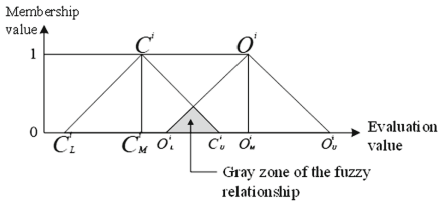
3 Methodology

3.1 Setting up the Factors and Criteria

The objective of this study is to investigate and compare the various factors that affect the register of real estate sold price by means of Fuzzy Delphi Method. To maintain the authenticity of the current study and to keep its originality of the multi-criteria decision making, we invited real estate marketers, university professors, government officials, and experts to talk at interviews and to take part in our questionnaire. After collecting and analyzing these relevant factors, we used Fuzzy Delphi Method for quantification and description.

3.2 Fuzzy Delphi Method

Fuzzy Delphi Method was proposed by Ishikawa et al. [1, 2], and it was derived from the traditional Delphi technique and fuzzy set theory. Delphi method can direct measure perception of service, performance service quality measurement [3]. Noorderhaben indicated that applying the Fuzzy Delphi Method to group decision can solve the fuzziness of common understanding of expert opinions [4]. As for the selection of fuzzy membership functions, previoous research was usually based on triangular fuzzy number, trapezoidal fuzzy number and Gaussian fuzzy number. This study applied the Two Triangle Fuzzy Numbers method and the Gray statistics method theory to solving the group decision [5]. This research applied FDM for the screening of alternate factors. The fuzziness of common understanding of experts could be solved by using the fuzzy theory and could be evaluated on a more flexible scale. The efficiency and quality of questionnaires could be improved. Thus, more objective evaluation factors could be screened through the statistical results. The scores we got will fall on a continuum between the smallest value and the largest value. The latter is called the most optimistic value whereas the former is called the most conservative value.



Two Triangle Fuzzy Numbers Method Source：Zheng Changbin, 2001

Table 1. Scores obtained by screen results of evaluation under the "Function" dimension

Evaluation item	Conservative value		Optimistic value		Single value		Geeometric mean			Verification value			Expert consensus
	Min	Max	Min	Max	Min	Max	C^i	O^i	a^i	M^i	Z^i	M^i-Z^i	G^i
Leasing	5	8	9	10	5	10	6.70	9.32	8.03	2.62	−1.00	3.62	8.01
Residence	3	9	8	10	6	10	6.10	9.38	7.59	3.28	1.00	2.28	8.32
Shop	3	8	8	10	6	10	6.21	9.10	7.79	2.89	0.00	2.89	7.66
Investment	5	8	8	10	7	9	6.21	8.65	7.7	2.44	0.00	2.44	7.43

Table 2. Scores obtained by screen results of evaluation under the "Management" dimension

Evaluation item	Conservative value		Optimistic value		Single value		Geeometric mean			Verification value			Expert consensus
	Min	Max	Min	Max	Min	Max	C^i	O^i	a^i	M^i	Z^i	M^i-Z^i	G^i
Public	4	10	7	10	6	10	6.30	8.41	7.53	2.11	3.00	−0.89	7.83
Private	6	10	7	10	6	9	8.82	8.42	7.22	−0.40	3.00	−3.40	8.64

Table 3. Scores obtained by screen results of evaluation under the "Content" dimension

Evaluation item	Conservative value		Optimistic value		Single value		Geeometric mean			Verification value			Expert consensus
	Min	Max	Min	Max	Min	Max	C^i	O^i	a^i	M^i	Z^i	M^i-Z^i	G^i
Size of building	5	8	9	10	5	10	6.64	9.32	8.03	2.68	−1.00	3.68	7.98
Price of building	5	9	9	10	6	10	7.51	9.59	7.65	2.08	0.00	2.08	8.55
Location of building	3	8	8	10	6	10	6.21	9.38	7.79	3.17	0.00	3.17	7.80
Age of building	5	8	6	10	7	9	6.21	8.35	7.7	2.14	2.00	0.14	7.14

Table 4. Scores obtained by screen results of evaluation under the "Category" dimension

Evaluation item	Conservative value		Optimistic value		Single value		Geeometric mean			Verification value			Expert consensus
	Min	Max	Min	Max	Min	Max	C^i	O^i	a^i	M^i	Z^i	M^i-Z^i	G^i
Land	4	10	8	10	5	9	6.01	9.10	7.53	3.09	2.00	1.09	8.43
Building	5	9	8	10	7	9	6.51	9.18	8.05	2.67	1.00	1.67	8.32
Studio apartment condo	4	10	6	10	5	9	7.73	8.40	7.07	0.67	4.00	−3.33	8.06
Townhouse	6	9	8	10	7	9	8.08	9.24	7.97	1.16	1.00	0.16	8.57
Shop	4	10	7	10	5	9	8.49	8.55	7.25	0.06	3.00	−2.94	8.52
Commercial business buildings	3	10	7	10	5	10	6.06	9.02	7.98	2.96	3.00	−0.04	7.81
Factory office	4	10	6	10	5	10	6.18	8.85	7.72	2.67	4.00	−1.33	7.71
Barn storage	3	9	7	10	6	10	5.78	8.61	7.70	2.83	2.00	0.83	7.67

Source This study

4 Questionnaire

Based on the previous studies related on the register of real estate sold price, before the designing of our questionnaire, we also take into the consideration the criteria, the appropriateness, the feasibility and legislation of the register system. We divided the questionnaire into four primary themes or categories. They are functions of real estate, managements of real estate, contents of real estate, and types of real estate, each focusing on the specific areas in which experts might consider register of real estate sold price distinctively from government officials.

5 Data Analysis and Results

The focus of this study targets to investigate and compare the various factors that influence the sold price of real estate by means of Fuzzy Delphi Method. Due to the special knowledge in real estate occupation, various professionals, including real estate marketers, university professors and relevant government officials, take part in the questionnaire for our analysis. Next, the analysis of our questionnaire is as following (Tables 1, 2, 3 and 4).

6 Conclusion

The purpose of this study is to investigate and compare the various factors that influence the sold price of real estate. Based on the previous analyses, the findings revealed that the factors of "residence", "privacy", "townhouse", and "reasonable price" are the most significant factors stimulating the register of real estate sold price. This finding is of major importance to the lawmaking and policy making with regards to the real estate, which requires long-term observation and flexible evaluation.

References

1. Ishikawa, A., Amagasa, M., Shiga, T., Tomizawa, G., Tatsuta, R., Mieno, H.: The max-min Delphi method and fuzzy Delphi method via fuzzy integration. Fuzzy Sets Syst. **55**, 241–253 (1993)
2. Shiau, T.-A., Liu, J.-S.: Developing an indicator system for local governments to evaluate transport sustainability strategies. Ecol. Indic. **34**, 361–371, Nov (2013)