PLANNING MALAYSIA:
Journal of the Malaysian Institute of Planners
VOLUME 17 ISSUE 1 (2019), Page 377 – 388

CAPABILITIES OF REVEALED PREFERENCE METHOD FOR HERITAGE PROPERTY VALUATION

Junainah Mohamad[1] & Suriatini Ismail[2]

[1]*Faculty of Architecture, Planning and Surveying*
UNIVERSITI TEKNOLOGI MARA, MALAYSIA

[2]*Faculty of Architecture and Ekistics*
UNIVERSITI MALAYSIA KELANTAN, MALAYSIA

Abstract

In recent years, the increasing availability of large databases on real estate transaction has opened up new research possibilities using revealed preference method. Therefore, the aim of this paper is to investigate the capability of revealed preference method of ordinary least square and rank transformation regression models in valuing shophouse heritage property. This paper has provided the first application that consider the thin market effects by comparing the ordinary least square and rank transformation regression in obtaining the market value of shophouse heritage property. The original dataset consists of 893 commercial properties transacted from 2004 to 2014 in Kota Bharu, Kelantan Malaysia. After filtration process, only 25 units of shophouse heritage property were available and valid to be used. The findings suggest that rank transformation regression model performs better than the ordinary least square model with double-log as the best model. This suggests that rank transformation regression is capable for heritage property valuation in thin market situation.

Keywords: revealed preference method, shophouse heritage property, ordinary least square, rank transformation regression, thin market

[1]Lecturer at Universiti Teknologi MARA. Email: mjunainah@uitm.edu.my

INTRODUCTION

Valuation of heritage property differs from valuation of other kinds of asset or property because heritage property is not being traded actively in the market. The uniqueness of heritage property makes it difficult to be valued using the existing conventional method. The most recent innovative methods used in valuing heritage property are the stated preference (SP) and revealed preference (RP) methods. Essentially, it is very important to assess the heritage property value in order to 1) acknowledge and respect the full worth of heritage asset, 2) appreciate the need for maintenance and preservation of heritage property and, 3) assist in responding to calls for more accountability for the sustained use of these assets. Due to absence of awareness, people think that heritage property is non-reproducible, non-economic and non-substitutable commodity (Greffe, 1998). There are challenges exist in valuing this assets which are to understand the meaning of heritage property (Holden, 2004; O'Brien, 2010; Yung, 2007), how to measure the heritage property, the existence of effective method (Aversano & Ferrone, 2012; Landriani & Pozzoli, 2013; Mason, 2002; Yung, 2007), and knowledge or expertise in conducting the heritage property valuation (Holden, 2004; Selwood, 2010).

Recently, the availability of property transaction database makes it possible to employ RP method. By collecting data on many different buildings, a regression analysis can be used to determine the correlation (relationship) of each characteristic to the transaction price – e.g. physical, historical, and spatial characteristics. Each of these correlations can be measured to determine a degree of confidence (i.e. significance) and then subsequently be used to build a regression model. The regression model can be useful to determine the intrinsic value of each attributes, as well as to predict transaction prices.

The study by Leichenko, Coulson and Listokin (2001) stated that most of past hedonic studies typically used data from one geographical area to run regression model. However, there will be a problem in data processing if the dataset does not contain at least 30 samples per independent variable to run a statistically acceptable regression model (VanVoorhis & Morgan, 2007). Consequently, 10 independent variables would require 300 samples. It is a fact that heritage property market is thin. Sometimes, only around 20 transactions are available for a period of more than 10 years. In order to overcome this thin market problem, the study by Leichenko et al. (2001) has expanded its data size by expanding the geographical boundary to encompass nine areas in Texas City. However, this means that the hedonic model being constructed is a general model. This may not be the most accurate model if the submarket existence which is a common feature of property market is considered. The study by Suriatini Ismail (2005) has suggested that statistically, a submarket-based can perform better than a general model.

Apart from thin market issue, previous studies also focused on the impact of historic designation towards increasing or decreasing the property value. To date, two studies, which are by Ruijgrok (2006), and Lazrak, Nijkamp, Rietveld and Rouwendal (2014) have empirically used hedonic model for assessing heritage property values by including historical attributes. Study by Ruijgrok (2006) in Netherlands was the first study that employed hedonic model for measuring heritage property values by taking into account the historical attributes. However, the study did not make correction for spatial dependencies nor the historical spatial pattern. Thus, the study by Lazrak et al. (2014) responded to this gap by taking spatial dependencies into account. However, both studies did not take into account the issue of thin market where the transactions of heritage property market are limited (not being traded actively). Many studies have struggled with problem of limited number of transactions and for that reason, many researchers have used SP method compared to RP method (Lazrak et al., 2014).

The study by Mohamad (2012) proved that rank transformation regression (RTR) can resolve the thin market issue. The statistical results of MSE are smaller compared to OLS. Therefore, the aim of this study is to evaluate the capability of RP method of OLS and RTR models in valuing shophouse heritage property with thin market circumstances. The use of RTR for measuring the value of historical building with consideration of thin market effect is novel. While Ruijgrok (2006) and Lazrak et al. (2014) focused on developed countries, this study provides empirical evidence from a developing country.

LITERATURE REVIEW

In real estate valuation, the goal of valuation process is to estimate the best possible value for specific property. There are three common approaches used to obtain the value of the property, which are sale comparison, cost and income capitalization approaches (Wyatt, 2013). Depending on the availability of the data and the type of property being valued, normally all of these three approaches do not produce the same figure for the value and not similarly reliable (Mattia, Oppio, & Pandolfi, 2012).

The focus of this paper is to determine the best method to be used in valuing historical building of shophouse using RP method by considering thin market effect. This study employs two approaches of RP method, which are the OLS and RTR. RP methods exploit the relationship between some forms of individual behavior (e.g. buying a house) and associated environmental, physical, neighborhood attributes to estimate the value. By definition, a thin market refers to low volume of market transaction which exists when there are only few concurrent buyers and sellers in the market and it is also associated with the behavior of the market (Anderson, Hudson, Harri, & Turner 2007; Jacobus, 2006).

Nonetheless, it is a real challenge when dealing with old property. In addition, the deteriorating condition of the heritage property and archaic services may affect the value of heritage property. Besides that, the heritage property is protected by policy and the restriction may affect the values and its marketability. The transaction of heritage property market is limited. The studies by Greffe (1998), Mohamad (2012), Selwood (2010) have argued about the ability of OLS in valuing residential property values of small sample size. Therefore, the authors have suggested the use of RTR in order to overcome the thin market issue. Furthermore, RTR can overcome the non-normal distribution problem and outliers. The value estimates produced by the RTR is more accurate and successful in statistical performance.

Hence, it is very difficult to apply OLS on heritage property since this method produces error which is suitable for large data. Therefore, we need an appropriate method to measure heritage property. Our literature indicates that the methods used in valuing heritage property such as Contingent Valuation (CV) Method, Hedonic Pricing Method (HPM), Travelling Cost Method (TCM) and others. However, this study will focus on RP method of OLS and RTR

RESEARCH METHODOLOGY

The study used a quantitative research method. As stated before, past studies often used SP method in valuing heritage property. Recently, the availability of detailed historical microdata makes it possible to value heritage property using RP method. This section first describes the OLS and RTR models followed by the study region and then continues with comprehensive discussion of the data to estimate the heritage property values using RP method.

OLS is an extension of the comparison method of valuation. OLS explains and evaluates the relationship between variables and other variables. The variables in OLS are divided into dependent variable Y (property price) and independent variables X (property characteristics). RTR is a simple procedure whereby the data are arranged in corresponding order i.e rank 1 for the largest observation and rank *n* for the smallest observation. The studies by Iman (1974) and Montgomery (2008) state that RTR is a robust and powerful tool to be used in hypothesis testing. This technique is widely used in many fields of study but yet to be explored in heritage property valuation. The RTR procedure considers the theory of property valuation to rank comparable properties from best to worst (Cronan, Epley, & Perry, 1986). The application of RTR takes the same steps as OLS. Nevertheless, the difference between the methods is that the RTR method is applied in rank form where all nominal data are converted into rank, including the dependent variable (property price). The estimate value is also produced in a rank form.

The secondary data on property transactions for this paper were collected in digital form from Kota Bharu State Valuation and Property Services

Department (VPSD Kota Bharu). The data contained record of commercial property transactions in Kota Bharu, Kelantan from 2004 to 2014. The data used have been provided by VPSD Kota Bharu and concerned pre-war shophouse transactions from 2004 to 2014. Over 11 years, only 25 transactions involved the pre-war shophouse. Comparing with previous studies by Lazrak et al. (2014), the total transaction data used for the study was 51 for a period of 22 years from 1985 to 2014. This paper involved a period of 11 years from 2004 to 2014 with total transaction of 25. Therefore, the observation was still valid as heritage property is classified as special property with limited transactions. The VPSD Kota Bharu has provided data on numerous transactional and structural characteristics of each transactions. The data were enriched with information obtained from Kota Bharu Municipal Council (MPKB) and site inspections especially in order to improve the data regarding historical characteristics.

The registered sale price was the actual price paid for the shophouse. Thus, the price data used in this study was transaction price. However, during filtration process, only arm's length transaction is considered. Some additional transaction-related characteristics were used as control variables such as the year of the transaction taken. The structural characteristics include floor area, land area, building improvement, building material, maintenance of the building, type of ceiling. Historical characteristics included façade status, architectural style, ensemble and authenticity.

Table 1 shows the filtering process of the original set of data from 2004 to 2014 in which only 25 observations (pre-war shophouse) remained for this study. The data were examined for completeness and usefulness to develop the RP models.

Table 1: Record of data cleaning process

No.	Notes	Number of Records Left
1	Original data from 2004-2014 for commercial property received from VPSD Kota Bharu	893
2	Excluding non shophouse property	617
3	Excluding terrace plots	406
4	Excluding incomplete and redundant data	365
5	Excluding property transaction record based on street's name. Choose only; *Jln Ismail, Jln Temenggong, Jln Che Su, Jln Dato Pati, Jln Hilir Pasar, Jln Gajah Mati, Jln Hulu Pasar, Jln Ismail, Jln Padang Garong, Jln Pos Office Lama, Jln Suara Muda, Jln Tg Putera Semerak, Jln Tok Hakim, Jln Maju*	70
6	Excluding records with share	51
7	Excluding property outside listed heritage property under Kota Bharu Municipal Council	47

8	Excluding records with incomplete or confusing information	25

RESULTS AND DISCUSSION

In this section, the results of RP method are presented and discussed, whereby the focus is to select the best model for heritage property valuation for thin market. Based on literatures, most past research found a positive impact of heritage property on property prices. In our opinion, OLS is suitable to be used for large sample; therefore, the OLS may not be the best method as transaction of heritage property is limited.

Table 2 summarised the results of OLS and RTR for functional form selection. The stepwise method was used in estimating the OLS and RTR models. Three functional forms were tested in choosing the best form of value-estimating model for shophouse heritage property. These functional forms were linear, semi-log and double-log. The tests were divided into two, which are with or without historical characteristics. The purpose is to examine whether the historical characteristics give positive or negative impacts toward property value. The result shows that the historical characteristics have significant positive effect to the property values.

The results indicate that double-log form of RTR model with historical characteristics is the best model in valuing shophouse heritage property with the highest Adj R^2 (98.7%) compared to double-log form of OLS with historical characteristics (89.6%). The SSE for RTR model is lower by 4% compared to OLS. A reduction of 17% in LL value of the OLS to the RTR model also indicates an improvement in the model's goodness of fit. A value of more than 3 indicated by AIC and AICc for the RTR model signifies an improvement to that of the OLS.

Table 3 shows the multicollinearity test for OLS and RTR models. The results indicate that the VIF values for all independent variables below 5 indicating that there was no serious multicollinearity among them (Suriatini Ismail, 2005). Table 3 also shows the significant variables for OLS and RTR models using t-test values. Both models have difference significant variables. If the variables have t-values greater than ±2 the variable considered significant (Brooks & Tsolacos, 2010). The overall t-values in RTR model were greater than those in the OLS model. It shows that the statistical performance of RTR model was better compared to the OLS model. There were five significant variables for OLS model which are year of 1) valuation taken in 2006, 2) year of valuation taken in 2013, 3) T*emenggong* road, 4) MFAlog is main floor area transform into log and 5) architectural functionalistic is referring to historical characteristics. While, for RTR models there were eight significant variables included 1) year of valuation taken in 2004, 2) year of valuation taken in 2006, 3) year of valuation taken in 2013, 4) RLAlog referring to land area transform into raking form and log, 5) maintenance_outside referring to condition outside of the property, 6)

Ensemble_harmony referring to historical characteristics, 7) freehold is referring to building tenure and 8) Floor_pergo_syntetic) is referring to type of floor material.

Table 2: OLS and RTR summary for functional form selection

Model Selection			Linear	Semi Log	Double Log
Without historical characteristics	OLS	R^2	0.804	0.804	0.803
		Adj R^2	0.765	0.764	0.764
		SSE	96088.865	0.16306	0.163
		LL	-242.702	9.745	9.716
		AIC	495.403	-9.491	-9.433
		AICc	500.019	-4.876	-4.817
	RTR	R^2	0.948	0.987	0.949
		Adj R^2	0.921	0.977	0.930
		SSE	1.5686	0.12071	0.213
		LL	-31.147	14.322	6.029
		AIC	78.294	-10.644	1.942
		AICc	92.694	9.356	12.124
With historical characteristics	OLS	R^2	0.804	0.862	0.896
		Adj R^2	0.765	0.822	0.856
		SSE	96088.865	0.14157	0.128
		LL	-242.702	13.086	15.775
		AIC	495.403	-14.171	-17.550
		AICc	500.019	-7.171	-7.369
	RTR	R^2	0.839	0.987	0.987
		Adj R^2	0.793	0.977	0.977
		SSE	2.545	0.12071	0.123
		LL	-41.807	14.322	19.026
		AIC	95.614	-10.644	-18.051
		AICc	102.614	9.356	9.449

Table 3: Summary of multicollinearity test

OLS Model			RTR Model		
Significant Variable	VIF	T-Test	Significant Variable	VIF	T-Test
Y06	1.151	-7.769	R_luaslot_log	2.554	7.119
Temenggong	3.572	5.966	Y2013	2.243	-9.464
MFA_log	1.947	5.329	Y2004	1.358	9.043
Architectural_functionalistic	3.472	-2.827	Pegangan	1.061	-6.812
Y13	1.198	2.255	Floor_pergo_syntetic	2.998	-6.272

			Ensemble_harmony	3.385	2.381
			Y2006	1.343	4.686
			Maintenance_outside	2.114	-2.326

Revealed Preference Method of OLS and RTR

Based on the functional form selection, both models of OLS and RTR indicate that double-log equation produces the best results. Hence, this section applies the selected model into observation data in order to investigate which model is better to use in thin market situation. The equation for double log-RTR and double log-OLS models are as follows:

a) The OLS model is given by:

MV = 9.848 - 0.795(Y06) + 0.235(Y13) + 0.668 (temenggong) + 0.630(MFAlog) – 0.350(architectural_functionalistic)

Where;
MV is market value
Y06 is year of valuation taken in 2006
Y04 is year of valuation taken in 2013
Temenggong is referring to road name where the shophouse heritage property is located
MFAlog is main floor area transform into log
Architectural functionalistic is referring to historical characteristics

b) The RTR model is given by:

MV = 2.305 + 0.965(Y04) + 0.497(Y06) - 1.298(Y13) + 0.407(RLAlog) – 0.883(freehold) – 1.367(Floor_pergo_syntetic) – 0.310(maintenance_outside) + 0.255(ensemble_harmony)

Where;
MV is market value
Y04 is year of valuation taken in 2004
Y06 is year of valuation taken in 2006
Y13 is year of valuation taken in 2013
RLAlog is referring to land area transform into ranking form and log
Maintenance_outside is referring to condition outside of the property
Ensemble_harmony is referring to historical characteristics
Freehold is referring to building tenure
Floor_pergo_syntetic) is referring to floor type

In order to determine the better prediction model considering thin market issue, both equations were applied to the out-of-sample observations. Table 4 and 5 show the results of MAPE's OLS and RTR according to types of observation in-of-sample and out-of-sample observations. Table 6 shows the comparison of

predictive capability between the OLS and the RTR models. The RTR model has predicted the property prices with much lower percentage of error compared to OLS model for both in-sample and out-sample. About 90% of the total number of predictions of in-of-sample and 100% out-of-sample data using the RTR model fell within 10% of the original shophouse heritage prices. According to Joslin (2005) the parameters of a sale price within another assessments should not lease ±5% to ±10% differences. Based on Table 6, it can be concluded that the RTR model is a better predictive model compared to the OLS model in valuing shophouse heritage property with thin market effect.

Based on the analysis, double-log RTR model is the best model for measuring shophouse heritage property. Therefore, the discussion is based on this model. Based on the models, there are eight significant variables affecting the value of shophouse heritage property. The significant variables are year of valuation (Y04, Y06, Y13), land area in rank form with natural log, building tenure (freehold), type of floor (pergo synthetic), outside maintenance and historical characteristic (ensemble harmony). However, year of valuation (Y13), tenure, type of floor (pergo synthetic) and outside maintenance have negative effects.

Table 4: The results of MAPE OLS and RTR according to types of observation in-of-sample observations

Sample	Price (000)	OLS in-sample	Price estimated	MAPE (OLS)	Rprice	RTR in-sample	Rprice estimated	MAPE (RTR)
1	850	13.62	824661	3%	3	1.16	3.18	-6%
2	510	13.10	488507	4%	14	2.70	14.95	-7%
3	550	13.28	583307	-6%	12	2.52	12.48	-4%
4	420	12.96	426451	-2%	18	2.89	17.98	0%
5	250	12.59	294410	-18%	19	2.95	19.15	-1%
6	530	13.10	490536	7%	13	2.55	12.87	1%
7	600	13.22	553564	8%	10.5	2.30	9.97	5%
8	800	13.59	801601	0%	6.5	1.96	7.09	-9%
9	800	13.45	694559	13%	6.5	1.87	6.51	0%
10	800	13.56	777503	3%	6.5	2.07	7.92	-22%
11	500	13.20	542321	-8%	16	2.73	15.36	4%
12	900	13.73	919826	-2%	2	0.63	1.88	6%
13	810	13.52	746486	8%	4	1.39	4.03	-1%
14	500	12.95	421579	16%	16	2.76	15.83	1%
15	600	13.56	777503	-30%	10.5	2.07	7.92	25%
16	800	13.45	694559	13%	6.5	1.87	6.51	0%
17	500	13.22	551050	-10%	16	2.70	14.95	7%

18	640	13.32	609803	5%	9	2.24	9.40	-4%
19	1,050	13.93	1119303	-7%	1	0.00	1.00	0%

Note: Cells shaded in grey indicate the MAPE values exceed ±10% differences for in-of-sample

Table 5: The results of MAPE OLS and RTR according to types of observation out-of-sample observations

Sample	Price (000)	OLS out-sample	Price estimated	MAPE	Rprice	RTR out-sample	Rprice estimated	MAPE
1	650	12.78	357513	45%	9.5	2.30	9.97	-5%
2	650	12.78	357513	45%	9.5	2.30	9.97	-5%
3	700	13.39	658116	6%	10.5	2.44	11.50	-10%
4	700	13.48	718059	-3%	10.5	2.44	11.50	-10%
5	807.12	13.15	514657	36%	3	1.11	3.04	-1%

Note: Cells shaded in grey indicate the MAPE values exceed ±10% differences for out-of-sample

Table 6: OLS and RTR predictive performance

Prediction Errors	OLS		RTR	
	In-of-sample	Out-of-sample	In-of-sample	Out-of-sample
MAPE				
≤ ± 10%	14	3	17	6
≥ ± 10%	5	3	2	0
In-sample; N =19 Out-sample; N = 6				

The historical characteristic of ensemble harmony also appears to be significant, while the reported coefficients have the expected sign and magnitude (positive). Ensemble harmony variables is defined as left, right and cross-facing neighbors of the prewar shophouse of the same architectural style.

There are two models involved in the development of RP method, which are OLS and RTR. The comparisons are made between these two methods because of thin market issue. As mentioned, the heritage property market involved limited transaction over the years. Based on previous study, OLS is widely used in real estate research. The study by Mohamad (2012) found that the property market is thin when it is divided based on submarket. This fact is also agreed by Suriatini Ismail (2005) in which she suggested, research should be conducted to identify the appropriate method and tools to be used in real estate valuation by taking into account the issue of thin market.

Therefore, this study suggests the use of RTR in capturing the thin market issue. By taking similar steps and statistical tests with OLS where the differences

are only on dependent and independent variables where those variables are in ranking form (from best to worst).

CONCLUSION

This paper has managed to establish an innovative model for valuing shophouse heritage property considering thin market effect by incorporating the ranking element in the model specification, as the RTR is the best model. The implications of this study towards real estate valuation are:

i. This study has adapted and implemented the RP method of OLS and RTR in valuing Grade II heritage property with special consideration of active market with limited transaction.
ii. It considers thin market effects and historical characteristics in valuing heritage property for more accurate, reliable and practical results.

Finally, it is very important to identify a new empirical approach that can provide a unique opportunity to make significance improvement in establishing an effective method for valuing heritage property with consideration of thin market issue. Furthermore, establishing proper historical characteristics of heritage property would be recommended for future research.

ACKNOWLEDGEMENT

The authors express gratitude to the Valuation and Property Services Department of Kota Bharu and Kota Bharu Municipal Council for providing the data and the Ministry of Education Malaysia, Higher Education for funding the research (FRGS: FRGS/1/2018/WAB03/UITM/03/1). Our gratitude also goes to the anonymous and suggestions on the early draft of this paper.

REFERENCES

Anderson, J. D., Hudson, D., Harri, A., & Turner, S. (2007). A new taxonomy of thin markets. In *Southern Agriculture Economics Association Annual Meeting, Mobile, AL*.

Aversano, N., & Ferrone, C. (2012). The accounting problem of heritage assets. *Advanced Research in Scientific Areas 2012*, (3.-7), 574-578.

Brooks, C., & Tsolacos, S. (2010). *Real estate modelling and forecasting*. Cambridge University Press.

Cronan, T., Epley, D., & Perry, L. (1986). The use of rank transformation and multiple regression analysis in estimating residential property values with a small sample. *Journal of Real Estate Research*, *1*(1), 19-31.

Greffe, X. (1998). *The economic value of heritage*. *Colloquio di Ahmedabad*. National Trust of India.

Holden, J. (2004). *Capturing cultural value*. London: Demos.

Iman, R. L. (1974). A power study of a rank transform for the two-way classification model when interaction may be present. *Canadian Journal of Statistics*, *2*(1-2),

227-239.

Jacobus, C. J. (2006). *Real estate principles*. Mason (Ohio): Thomson/South-Western.

Joslin, A. (2005). An investigation into the expression of uncertainty in property valuations. *Journal of Property Investment & Finance*, *23*(3), 269-285.

Landriani, L., & Pozzoli, M. (2013). *Management and valuation of heritage assets: A comparative analysis between Italy and USA*. Springer Science & Business Media.

Lazrak, F., Nijkamp, P., Rietveld, P., & Rouwendal, J. (2014). The Market value of cultural heritage in urban areas: An application of spatial hedonic pricing. *Journal of Geographical Systems*, *16*(1), 89-114.

Leichenko, R. M., Coulson, N. E., & Listokin, D. (2001). Historic preservation and residential property values: An analysis of Texas cities. *Urban Studies*, *38*(11), 1973-1987.

Mason, R. (2002). Assessing the values of cultural heritage. In M. de la Torre (Ed.), *Assessing values in conservation planning: Methodological issues and choices*. Los Angeles: The Getty Conservation Institute.

Mattia, S., Oppio, A., & Pandolfi, A. (2012). Testing the use of contingent valuation method in real estate market: First results of an experiment in the city of Milan. *Aestimum*, 721-734.

Mohamad, J. (2012). Assessment of property values in thin market using rank transformation regression and multiple regression analysis. Universiti Teknologi Malaysia, Faculty of Geoinformation and Real Estate.

Montgomery, D. C. (2008). *Design and analysis of experiments*. John Wiley & Sons.

O'Brien, D. (2010). *Measuring the value of culture: A report to the Department for Culture Media and Sport*.

Ruijgrok, E. C. M. (2006). The three economic values of cultural heritage: A case study in the Netherlands. *Journal of Cultural Heritage*, *7*(3), 206-213.

Selwood, S. (2010). *Making a difference: The cultural impact of museums; an Essay for NMDC*.

Suriatini Ismail. (2005). Hedonic modelling of housing markets using geographical information system (GIS) and spatial statistics: a case study of Glasgow, Scotland. University of Aberdeen.

VanVoorhis, C. R. W., & Morgan, B. L. (2007). Understanding power and rules of thumb for determining sample sizes. *Tutorials in Quantitative Methods for Psychology*, *3*(2), 43-50.

Wyatt, P. (2013). *Property valuation*. John Wiley & Sons.

Yung, H. K. (2007). *Architectural heritage conservation in Hong Kong: an empirical analysis*. *HKU Theses Online (HKUTO)*. The University of Hong Kong (Pokfulam, Hong Kong).

Received: 28th October 2018. Accepted:1st March 2019