Evaluating the Effect of Green Certificate Building on the Condominium Price in Petaling Using Multiple Regression Analysis (MRA)

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Abstract -"Green" rating system, such as the Green Building Index's (GBI) are leading to change in the way owners, designers, and developers approach the design, construction, and operation of buildings. The features included in green design and construction may have positive and negative effects on properties price or value. The obligatory measurement of green building certificate in private dwellings seeks to encourage improvements in green building developments. Thus, this research paper aims to discuss on an examining the relationship between a green building certificate and property transaction price in the District of Petaling condominium market using Multiple Regression Analysis (MRA). In achieving these aims, the original dataset consists of 9,175 condominium properties transacted from 2016 in Petaling, Selangor. After filtration process, only 4,149 units of condominium property were available and valid to be used. The finding revealed that there is correlation between transaction price and green building certificate at r=0.29 with is a small correlation with positive direction. The results of this research show that green building certificate has a statistically significant positive correlation with transaction property price. This finding suggests that green building certificate have the potential to increase the transaction price, thereby decreasing the negative environmental impacts associated with generating green development. It shows small correlation, however, it will indicate that a considerable relatively with the condominium transaction price. Therefore, this research hopes to highlight the economic, environmental and social features of the condominium building.

Keywords: real estate valuation; condominium property; multiple regression analysis (MRA)

I. INTRODUCTION

The residential property market in Malaysia has always been an important component of the domestic economy. Housing development programs are typically used to stimulate economic activity. The increase in demand for housing and the scarcity of land for development revolving landed residential properties in major urban areas in Malaysia such as Penang, Kuala Lumpur, Selangor and Johor Bahru has resulted in the rapid development of housing, especially, high-rise residential schemes in these high-density areas. For households and businesses, residential properties have also become an attractive form of investment. Houses are investment assets that grow in value over time and are, therefore, a means of saving and wealth accumulation (Mohd Thas Thaker & Chandra Sakaran, 2016). Consequently, increasing the demands of housing also contribute to the environmental problems. The tremendous growth in economic activity across the globe is placing pressure on natural and environmental resources. It is often said that the real estate industry is a significant contributor to the global warming due to extensive emissions of greenhouse gases (GHGs) from the energy used in buildings. As such, building professionals are continually finding ways to make sure the construction industry plays its part and contribute to saving Mother Nature (Chian, 2013). Advantages of this, we can see in recent years that more property developers are joining the green movement by constructing more sustainable buildings or commonly called green buildings. However, (Chian, 2013) claimed that green feature gives additional cost to the development and may cause of increasing of the property price. The question arises: can green features be considered, like many other housing characteristics, as a housing characteristic? Traditionally the housing price has been calculated as a function of various housing attributes. Most real estate industry at this infant of green buildings may lack experience in value green building. There were many factors which have contributed to a sharp increase in the price of houses. These can be categorised as demand and supply factors. Hence, this

research seek to investigate either green building certificate are one of the factors that influence the property price.

II. LITERATURE REVIEW

A. Condominium Market in Malaysia

In recent years, the Malaysian faces physical expansion of major cities has pushed urban land uses to extend, producing a continuous urban landscape which spreads into the surrounding agricultural areas. The effect is as predicted, the conversion of more rural lands into urban-industrial complexes and buildings. The city social and cultural medleys are also rapidly changing. The new structure of residential areas has altered the pattern demography and socio-cultural set-up in the cities(Ahmad et al., 2009).

View from the end of 2000, the property outlook suggests that with land prices experiencing an upward trend, strata properties, particularly affordable and sustainable schemes, continue to receive encouraging demand in the local housing market. High-rise living in urban centres is a logical response to raise land prices. Ministry of Finance, Valuation and Property Services Department (2015) press release reported that developers continue to remain positive in the primary property market, with a higher number of new launches recorded in 2014. There were 68,351 units of new launches, up from 62,376 units recorded in 2013. The rise was partly due to the high numbers of condominiums and service apartments, which formed nearly 44.9 per cent of the new launches.

A total of 247,251 transactions recorded worth RM82.06bn in 2014, up by 0.4 per cent in volume and 13.9 per cent in value from 2013. The residential property continued to be the main contributor to the national property market, accounting for 64.4 and 50.4 per cent of the volume and value, respectively. Selangor, Johor and Perak remained the three leading states in the residential segment, with 24.6, 15.8 and 11.0 per cent market share, respectively (Ministry of Finance, Valuation and Property Services Department, 2015).

Improvement to better living among city population and good income sources cause a high demand from the potential buyers. As the voice of demand for going green grows rapidly, the real estate industry is expected to play an increasingly active role in the realization of a low-carbon society.

B. Demand for Green Building Development

Increasing demand for condominium may cause of environment problem especially extensive emissions of greenhouse gases (GHGs) from the energy use in buildings (Chian, 2013). However, the greater awareness, especially among stakeholders, such as owners, investors, developers, occupiers and the public sector has placed the issue of sustainability as a high priority globally (Ng, 2013).

In Malaysia, this market has shown a sign of maturity, with more educated and sophisticated house buyers tend to become selective and demanding, requiring prime location, attractive features and designs, green elements, and quality finishes. Developers have responded by countering to the taste and preferences of buyers by becoming more creative and by providing contemporary features and designs equipped including green features with attractive landscape and facilities.

In other hand, development of green building is referred to as those that are of reducing the negative effects of real estate development on the environment and human health with the aim of promoting sustainable life (Aliagha, Hashim, Sanni, & Ali, 2013). The changing patterns and socioeconomic trends give an impact on the housing market. Meeting the demands of aspiring homeowners, especially first-time buyers, is expected and used as evidence that the country has successfully made the transition.The increase in income directly increases the individual purchasing power and also the demand for housing (Department of Statistic 2003).

One of the initiatives to fulfil the demand of green development, government play their role by introducing green building certificate (GBI) to the real estate industry. Several implementations included are an improvement of living standards, promoting sustainable development system, preserving and conserving the environment, and green supply management. The entire agenda is based on the implementation of Agenda 21, Sustainable Development Program United Nations (UN). Throughout the agenda, Malaysia was interested to follow the footsteps of developed countries in developing foresight in-line with the consensus with other countries as included in the World Summit on Sustainable Development (WSSD) on the planning and direction of green development in the new millennium (Elias & Lin, 2015).

C. Green Certificate (GBI) as an Indicator of Green Building

The level of social and environmental value that greenness (green labels) bring to the property is expected to be appreciated by the buyers, and this can be tested through their willingness to pay. In order for the economic benefits of green buildings to be realized in the market, it is necessary that information about the green features of real estate be disclosed and distributed (Jayantha & Man, 2013). GBI is one of the indicators to promote green building development. In general, for any development, we are always looking for ways to maximize the output of a building with a lower CAPEX and focusing on lowering the Life Cycle Cost of a building. Therefore, in the year 2009, driven by the environmental needs to make Malaysia's construction industry more sustainable in the future, the Green Building Index (GBI) was jointly founded and developed by Malaysian Institute of Architects and the Association of Consulting Engineers Malaysia (ACEM). "The GBI is Malaysia's industry recognized green rating tool for buildings to promote sustainability in the built environment and raise awareness among Developer, Architects, Engineers, Planners, Designers, Contractors and the public about environmental issues and our responsibility to the future generations" (Green building index,

2011).

Throughout the world, there are many types of green building certification, some of the well-received certifications comprise Leadership in Energy and Environmental Design (LEED), Building Research Establishment Environmental Assessment Method (BREEAM), Malaysia's Green Building Index (GBI) and Singapore's Green Mark. All the aforementioned certifying bodies are overseen by the World Green Building Council. This is to ensure that all projects will not only be sustainable, but are also people-friendly in terms of design and usability (Ahmad Fuad, 2012). According to Shimizu (2010), the first thing that is necessary to transform market participant's behaviour is to include specific information about green buildings into an information disclosure system such as GBI. The green building certification/award is such a system that can change the behaviour of the buyer. It is thus important that buyers are convinced that a particular green label (certification) is well recognized in the market and covers the whole set of the green features of a property. Green building certification, on the other hand, can assist a developer to obtain a good recognition in the property market. Thus, having a good green certification is regarded as an advantage over competitors. Recent years have witnessed an increasingly widespread green certification/label system in the real estate industry.

D. Factors Affecting Condominium Property Value

Factors influencing the condominium property values can be broadly divided into (5) five groups, namely transaction-related characteristics, structural characteristics, location characteristics, environment characteristic, and neighbourhood characteristics. Appendix 1 illustrates the conceptual framework of factors affecting condominium property values.

1) Transaction-related Characteristics

Sale prices are used as a control variable (dependent variable). According to Royal Institution of Chartered Surveyors, sale prices are the most reliable data source in assessing property values because it has been purely exposed to the open market value. Other- transaction related characteristics are land/building status (freehold/leasehold), year of valuation, building position, lot number and building number.

2) Structural Characteristic

The structural property characteristics data were obtained from the same sources as the sale price data. Structural characteristics in this study include lot size, main floor area, building improvement, roof material, types of floor, types of the ceiling, building material, and maintenance condition (outside/inside). To ensure the quality of structural characteristics, a site inspection was conducted to confirm all related structural characteristics, including any new renovation

3) Location Characteristics

The importance of location in determining property value has been widely discussed in the literature (McCord, McCord, McClusky, Davis, & McIlhatton, 2014; J. B. Mohamad, Ismail, Mar Iman, & Mohd, 2017). It is said that the main factors that influence property value are location, location, and location (Abidoye & Chan, 2016; Ge & Du, 2007; Messah, 2011). A demand rate for a particular property is affected by location (Kolbe & Wüstemann, 2015). This statement is supported McCord et al., (2014), who suggested that location is the dominant factor to understand property demand. Locational factors are related to accessibility to work, amenities, transportation, physical attributes, neighbourhood, and environmental quality, among others. All these factors are related to location (Abidoye & Chan, 2016). Commonly, the assessors obtain the information for the subject property based on the subjects‟ location. For instance, Location within a city is the most important factor in the property market. A substitution for the locational factor is distance, which is the length of physical separation between a property to the central business district (CBD).

4) Environment Characteristic

The green building certification/award is such a system that can change the behaviour of the buyer. It is thus important that buyers are convinced that a particular green label (certification) is well recognized in the market and covers the whole set of the green features of a property.

5) Neighborhood Characteristic

Residents of more population dense neighbourhoods located near urban centres accord greater value to the proximity of the property price, while suburban and rural residents do not seem to accord as much value (Huang, Du, & Yu, 2015). This is because an increasing density population, the demand for housing also increases. Social sustainability is based on the social aspects such as a feeling of well being, aesthetics, health and comfort, security and user satisfaction, appropriate living environment and social integration. The aspect of installation security systems within the list of fittings or specification that impacts the value of the property. Areas with high crime rates have lower property values compared to areas with low crime rate for similar properties (Jayantha & Man, 2013; McCord et al., 2014). Infrastructure development has contributed indirectly towards the house and property price as per revealed by the previous researchers. Neighbourhood facts affecting residential property value revealed that the level of infrastructure development. Most residents of the estate are attracted to the area not only because of the level of infrastructure development such as road and drainages as well as good estate plan and quality designs. Proper infrastructure in the residential area also contributes to the increase in house prices. Specifically, if a house is close to a school, shopping mall, bank, transportation facility, hospital, restaurant, church, temple, airport or any other place that can provide convenience to the people staying in that area, the house will undoubtedly possess a high housing value (J. Mohamad, 2012).

III. RESEARCH METHODOLOGY

Statistical Modeling Approaches

The secondary data on property transactions for this paper were collected in digital form from JPPH Shah Alam.

The data contained records of condominium property transactions in District of Petaling, Selangor for 2016. The data used have been provided by JPPH Shah Alam and concerned prewar condominium transactions for 2016. Therefore, the observation was still valid as green condominium property is classified as limited transactions.

The registered sale price was the actual price paid for the condominium property. Thus, the price data used in this study research were transaction price. However, during the filtration process, the developer's transaction price has been excluded. Some additional transaction-related characteristics were used as control variables such as the date of the transaction taken. The structural characteristics include main floor area, an age of the building, property type, number of bedrooms, and Floor. Environment characteristics included green building certificate or award (GBI). Neighbourhood characteristic was comprising population density (area classification), security (area condition), and infrastructure development.

Appendix 2 shows the filtering process of the original set of data from 2016 in which only 4,149 observations of condominium remained in this study. The green condominium is 214 observation, while non-green condominium is 3,937 observations. The data were examined for completeness and usefulness to develop the MRA. There were four steps involved in discarding "problematic" data, namely; 1) removing all incomplete data, such as those without information on the floor, main floor area, age, selling price, and others. This study research employed to enter the regression to run the analysis using IBM SPSS statistic (Chris Brooks & Sotiris Tsolacos, 2010). Appendix 3 shows the descriptive analysis of the final dataset used in this study research.

IV. RESULT AND DISCUSSIONS

A. Variance Inflation Factors (VIF)

VIF is a popular method used to detect multicollinearity. There are two opinions in indicating high multicollinearity using VIF. First, O'Brien, (2007) stated that a VIF value below 10 indicates low multicollinearity, and Des Rosiers, Thériault, & Villeneuve, (2000) and Thériault, Des Rosiers, Villeneuve, & Kestens, (2003) stated that a VIF value below 5 indicates low multicollinearity. However, according to Ismail & MacGregor, (2006), there is no theoretical basis for choosing which VIF value (either below 10 or below 5) in order to detect multicollinearity. Therefore, this study research adopts the value of 10 in detecting suspicious variables regarding multicollinearity. The VIF value of each variable is shown in Appendix 6.

B. Choice of Functional Form

Commonly, the generic features of a real-estate market are nonlinearity (Moro & Tol, 2011; Wilson, 1993) because the property market is heterogeneous; the price of a real-estate property is influenced by many variables. Therefore, in developing the MRA, this study research considered different functional forms, the purpose being to choose which functional form fits the data in hand best in order to explain the characteristics of the data. This study research used three types of functional forms: linear, semi-log, and log-log. The enter regression involved a dataset of 27 (in-sample) observations is shown in Appendix 4 with condominium transaction prices(sq.m.) as the dependent variables and 26 independent variables. The independent variables comprise the following 22 dummy variables, five continuous variables. The following subsection presents the result of linear, semi-log and log-log functional forms of the MRA models.

Appendix 5 shows the functional form. The preliminary linear regression analysis as shown in Appendix 5 that the level of explanation between the variable. The results indicate that the standard linear regression model form comprises the highest predictive explanation between variable. Determination of the functional form of the dependent variable was therefore undertaken to accurately apply the best model fit. The natural log (logn) of price was compared with the linear form. Relevant plots of residuals and predicted values were examined for normality, linearity, and homoscedasticity.

C. Normality Result

The statistic data analysis about 4,149 for each of the 27 variables. The range is the difference between the maximum and minimum values and as such measures the spread of the test scores. The normality test important to be checked to various aspects of the distribution of scores and the nature of the underlying relationship between the variables.

The result of the data above describes as normal distribute because both values as skewness and kurtosis for transaction price per sq.m is small which is 0.843 and 1.402. The data that are approximately normally distributed where both skewness and kurtosis indicates at ±1.96. That means each variable know as normal distributed, the value skewness and kurtosis should around between -1.96 dan + 1.96. Values for skewness and kurtosis are zero of the observed distribution is exactly normal (Andy Field, 2009).

According to Appendix 6 shows the distribution of property's transaction price. The transaction price is a dependent variable in this research. The transaction price is normally distributed because the highest pick is inside the curve. The data is beautifully distributed. However, other researchers, Fletcher et al. (2000) in (J. Mohamad, 2012) mentions that who contended that transaction prices are not usually normally distributed.

Besides, visual inspection of the p-p plot shows there is an excellent possibility that the data may normally be distributed. The closer the points are in the line, the greater the probability of normality. In addition, the scatterplot of the standardized residuals displays the residuals will be roughly rectangularly distributed with most of the scores concentrated in the centre which is along the 0 point.

D. The Performance of Functional Form

The linear, semi-log and log-log functional forms of the MRA models that have been estimated are shown in

Appendix 5. For MRA model, the linear functional form has the highest Adjusted R2 of 29.4% compared to the other two (28.7% for semi-log and 27.0% for log-log). In conclusion, the highest Adjusted R2 for MRA is a linear functional form with 29.4% was taken as the best equation models that reflects to the property price.

Highest Adjusted R2 is quite normal in time-series data. In addition, high Adjusted R2 with a few variables and the small sample can be indicative of serial correlation. Therefore, this can be concluded that the value of Adjusted R2 for MRA of this study is acceptable.

E. The Best Functional Form of MRA Models

Based on the functional form selection, the best functional forms are linear of MRA and semi-log of MRA models. Hence, this section applies the selected models into observation data to estimate the predictive value of the models. The equations of semi-log MRA and is:

MV=*-90310.290* + MFA**7.579* + Floor**42.581* + Bed**-344.297* + Age**-15.743* + Date**6.937E-006* + **GC1*11429.571*** + PT2**-341.571* + PT5**1217.987* + PT6**553.912* + AC3**444.435* + AC4**319.768* + BC2**-1149.089* + BC3**623.081* + SELL1**-1669.447* + SELL3**-368.969* + SELL5**-770.981* + BUY2**-473.149* + BUY4**-426.186*.

Where; MV is referring to market value

V. CONCLUSION

Studies on green building certificate and the impact on residential property value have received considerable attention in research and industry in recent years. Justification of positive monetary impact has been deemed necessary to gain greater acceptance and adoption of sustainability and green practices in the real estate sector. This study research focuses on the residential which is condominium property and this study research providing quantitative analysis of certified green buildings and the positive impact on condominium property value. J. Mohamad, (2012) mentions that the sale comparison methods are most preferable and accepted methods by Malaysian valuers in valuing condominium property even though there is a limitation in applying this method that associated with limited market evidence for green condominium property. Having regard to the weaknesses of the traditional method of sale comparables, this study research test the applicability of the statistical method of analysis to conduct an assessment for green condominium property valuation i.e. n. The statistical methods are multiple regression analysis (MRA). The use of MRA in estimating real estate values has been shown widely in the appraisal literature. However, this technique needs a large amount of data. The results indicate that green building certificate gives an effect to the condominium property value as 29.4%.

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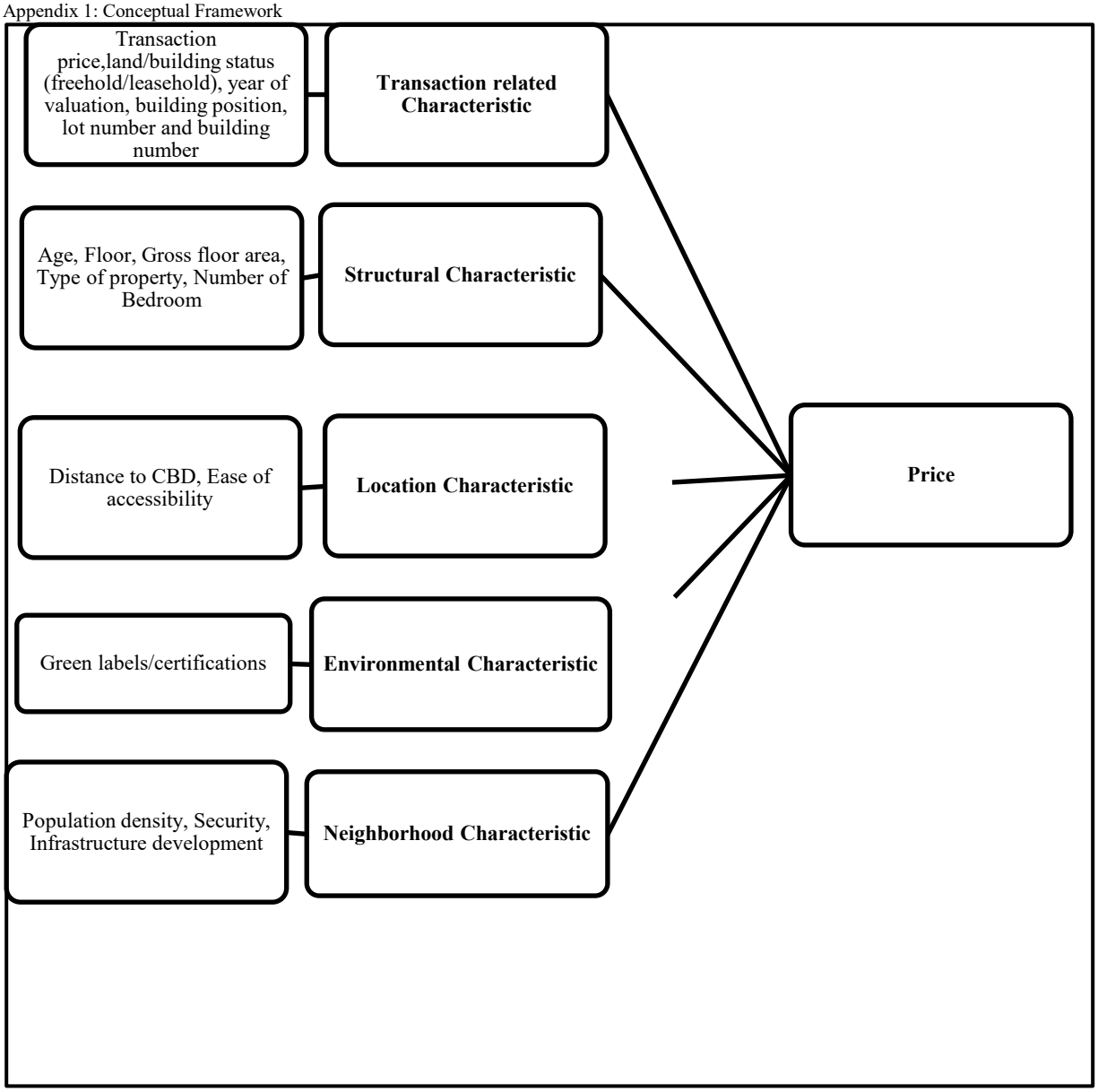
Appendix

Appendix 1: Conceptual Framework



Appendix 2: Data Cleaning

Data	Number of records left	
Original data 2016 for condominium in Selangor	9,175	
Excluding incomplete property data	7,331	
Excluded land use for business	7,330	
Excluding value from developer	4,149	
Green building that registered with GBI	214	4,149
Non green building	3,937	

Appendix 3: Descriptive Analysis

Descriptive Statistics									
	N	Min	Max	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Transaction Price	4149	10000	3800000	404479.00	287341.741	3.167	.038	17.626	.076

Transaction Price/ sq.m	4149	104	12264	4012.26	1683.235	.843	.038	1.402	.076
Distance (KM)	4149	.1	30.0	6.552	5.4810	1.699	.038	2.637	.076
Main Floor Area	4149	30.8	480.2	96.983	36.4556	2.854	.038	13.401	.076
Floor	4149	.1	39.0	7.704	5.8984	1.135	.038	1.355	.076
Number of Bedroom	4149	1	7	2.93	.385	-1.905	.038	14.962	.076
Age	4149	1	42	11.35	5.560	.279	.038	.164	.076
Transaction Date	4149	01/04/2016	12/30/2016	06/28/2016	104 23:37:53.29 9	.027	.038	-1.212	.076
GC1	4149	.00	1.00	.0516	.22120	4.056	.038	14.461	.076
PT1	4149	.00	1.00	.2384	.42614	1.229	.038	-.491	.076
PT2	4149	.00	1.00	.0304	.17162	5.476	.038	27.995	.076
PT3	4149	.00	1.00	.0007	.02688	37.162	.038	1379.664	.076
PT4	4149	.00	1.00	.4018	.49032	.401	.038	-1.840	.076
PT5	4149	.00	1.00	.0521	.22218	4.034	.038	14.282	.076
PT6	4149	.00	1.00	.2767	.44742	.999	.038	-1.003	.076
OWN1	4149	.00	1.00	.4628	.49867	.149	.038	-1.979	.076
CA1	4149	.00	1.00	.8431	.36376	-1.887	.038	1.563	.076
CA2	4149	.00	1.00	.0048	.06927	14.304	.038	202.700	.076
CA3	4149	.00	1.00	.1521	.35915	1.938	.038	1.758	.076
AC1	4149	.00	1.00	.0063	.07892	12.518	.038	154.771	.076
AC2	4149	.00	1.00	.7370	.44029	-1.077	.038	-.840	.076
AC3	4149	.00	1.00	.0554	.22886	3.887	.038	13.115	.076
AC4	4149	.00	1.00	.2013	.40099	1.491	.038	.223	.076
BC1	4149	.00	1.00	.9896	.10129	-9.673	.038	91.611	.076
BC2	4149	.00	1.00	.0043	.06573	15.089	.038	225.778	.076
BC3	4149	.00	1.00	.0060	.07740	12.770	.038	161.162	.076
CLASS1	4149	.00	1.00	.9923	.08749	-11.259	.038	124.816	.076
CLASS2	4149	.00	.00	.0000	.00000	.	.	.	.
CLASS3	4149	.00	1.00	.0077	.08749	11.259	.038	124.816	.076
SELL1	4149	.00	1.00	.0080	.08884	11.083	.038	120.882	.076
SELL2	4149	.00	1.00	.5850	.49279	-.345	.038	-1.882	.076
SELL3	4149	.00	1.00	.2393	.42673	1.222	.038	-.506	.076
SELL4	4149	.00	1.00	.0034	.05800	17.134	.038	291.713	.076
SELL5	4149	.00	1.00	.1644	.37066	1.812	.038	1.283	.076
BUY1	4149	.00	1.00	.6847	.46467	-.796	.038	-1.368	.076
BUY2	4149	.00	1.00	.2904	.45402	.924	.038	-1.147	.076
BUY3	4149	.00	1.00	.0017	.04105	24.293	.038	588.426	.076
BUY4	4149	.00	1.00	.0231	.15036	6.346	.038	38.290	.076

Appendix 4: Variable Classification

Variable	Name	Description	Type
Transaction Price/ft	Price/ft	Sales price/ft	C
Building Classification	Class	Not smart building	B
Transaction Date	Date	Transaction Date	C
Green Certificate	GC1	Dummy variable value equals one if property is green; Dummy variable value equals zero if property is not green certificate	B
Property Type	PT1	Dummy variable value equals one if property type is grant	B
Property Type	PT2	Dummy variable value equals one if property type is other	B
Property Type	PT3	Dummy variable value equals one if property type is lease of state	B
Ownership	OWN1	Dummy variable value equals one if property ownership is leasehold; Dummy variable value equals zero if property ownership is freehold	B
Catogery Area	CA1	Dummy variable value equals one if property is in good area	B
Catogery Area	CA2	Dummy variable value equals one if property is in not good area	B
Catogery Area	CA2	Dummy variable value equals one if property is in moderate area	B
Area Classification	AC1	Dummy variable value equals one if property is in secondary city center	B
Area Classification	AC2	Dummy variable value equals one if property is in main city center	B

Building Condition	BC1	Dummy variable value equals one if property is in new building	B
Building Condition	BC2	Dummy variable value equals one if property is in good condition	B
Seller Status	SELL1	Dummy variable value equals one if seller status is not citizen	B
Seller Status	SELL2	Dummy variable value equals one if seller status is citizen	B
Seller Status	SELL3	Dummy variable value equals one if seller status is local company	B
Buyer Status	BUY1	Dummy variable value equals one if buyer status is not citizen	B
Buyer Status	BUY2	Dummy variable value equals one if buyer status is citizen	B
Buyer Status	BUY3	Dummy variable value equals one if buyer status is foreign individual	B
Buyer Status	BUY4	Dummy variable value equals one if buyer status is foreign company	B
Distance (KM)	Distance (KM)	Distance to CBD	C
Main Floor Area	MFA	Main floor area	C
Floor	Floor	Floor	C
Number of Bedroom	Bed	Number of bedroom	C
Age	Age	Age	C
LogDistance	logDist	Dummy variable value equals one if buyer status is	C
LogMFA	logMFA1	Natural log of main floor area	C
LogFloor	logFloor1	Natural log of floor	C
LogBedroom	logBed1	Natural log of number of bedroom	C
LogAge	logAge1	Natural log of age	C
Log Transaction Price/ft	logPrice2	Natural log of sales price/ft	C
B=binary		C=continues	

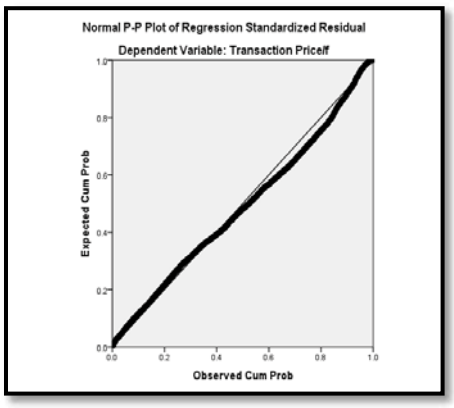
Appendix 5: Explaination of level

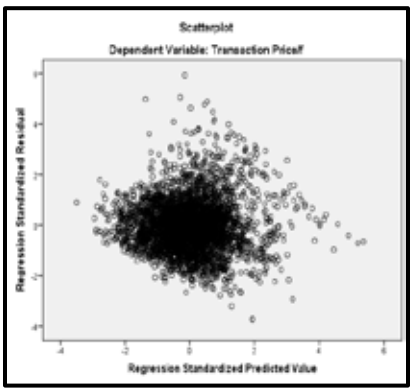
Attribute	MRA model			
	R	R^2	Adj R^2	Sig
Linear	0.545	0.297	0.294	0.000
Semi-Log	0.535	0.287	0.284	0.000
Log-Log	0.522	0.272	0.270	0.000

Appendix 6: Coefficients Analysis

Coefficientsa								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-90310.290	33264.382		-2.715	.007		
	Main Floor Area	7.579	.643	.164	11.788	.000	.878	1.139
	Floor	42.581	4.056	.149	10.498	.000	.843	1.186
	Number of Bedroom	-344.297	58.166	-.079	-5.919	.000	.962	1.039
	Age	-15.743	4.161	-.052	-3.783	.000	.901	1.110
	Transaction Date	6.937E-006	.000	.037	2.854	.004	.992	1.008
	GC1	1429.571	102.503	.188	13.947	.000	.938	1.066
	PT2	-341.571	133.564	-.035	-2.557	.011	.918	1.089
	PT5	-1217.987	102.368	-.161	-11.898	.000	.933	1.072
	PT6	-553.912	52.267	-.147	-10.598	.000	.882	1.134
	AC3	-444.435	98.653	-.060	-4.505	.000	.946	1.057
	AC4	319.768	57.421	.076	5.569	.000	.910	1.099
	BC2	-1149.089	336.770	-.045	-3.412	.001	.984	1.016
	BC3	623.081	287.048	.029	2.171	.030	.977	1.023
	SELL1	-1669.447	251.061	-.088	-6.650	.000	.970	1.031
	SELL3	-368.969	64.394	-.094	-5.730	.000	.639	1.565
	SELL5	-770.981	63.982	-.170	-12.050	.000	.858	1.166
	BUY2	-473.149	59.596	-.128	-7.939	.000	.659	1.518
	BUY4	-426.186	148.131	-.038	-2.877	.004	.972	1.028
a. Dependent Variable: Transaction Price/f								

Appendix 7: Normality Test


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: Transaction Pricelf
Expected Cum Prob
Observed Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0


Scatterplot
Dependent Variable: Transaction Pricelf
Regression Standardized Residual
Regression Standardized Predicted Value