

An Analysis of Office Investment Depreciation - Hedonic Modelling of Its Sources

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Abstract:

This paper attempts to develop a systematic statistical method for the analysis of office depreciation. An appropriate functional form, which avoids potential bias as well as links depreciation to physical deterioration, building and site obsolescence, is selected. A hedonic model for the city of Kuala Lumpur office rental depreciation aims to explain rather than to predict the phenomenon as the cross-section analysis of rental market in 1996 was undertaken. The perceived importance of variables in causing depreciation is identified and explained in detail. The result indicates that depreciation of offices in the city of Kuala Lumpur is largely dominated by physical deterioration and building obsolescence compared to site obsolescence.

Keywords: impact of depreciation, physical deterioration, obsolescence and hedonic modelling

Introduction

Depreciation and its impact on property investment has been the focus of many studies in the early 1980s. In the United Kingdom, the analysis of property depreciation concerns the growing awareness of property mispricing as a result of implicit analysis of its impact. This issue has raised the need for a better approach to quantify its impact as well as its capability to consider other depreciation variables apart from 'age'. The approaches to estimate depreciation have developed significantly since the last decade especially in economic (Hulten and Wykoff, 1996) and accounting. The methods progressed from a simple measurement to more complicated methods (bivariate to multiple depreciation causal) as well as the improvement of the methods with statistical tools aimed to appropriately quantify and explain property investment depreciation.

This paper aims to construct a hedonic model for office depreciation considering all possible causes of depreciation. This empirical model expands upon the previous studies (Md Yusof, 1999 and 1999a) relating the relationship between rental depreciation and three major causes of depreciation namely physical deterioration, building obsolescence and site obsolescence using the hedonic price technique. Within the context of a hedonic price model, various included variables explain the impact of depreciation, which is an alternative to the version whereby 'age' was used as a depreciation variable (Sykes, 1984; Salway, 1986; Barras and Clark, 1996 and Clapp and Giacotto, 1998). In this paper, depreciation factors, which are represented by original and an orthogonal combination of depreciation variables, are used. The original variables refer to variables collected from literature review and survey whilst orthogonal factors are variables extracted via the Principal Component Analysis (Md Yusof, 1999a). The hedonic

price for each factor is calculated and used to explain the perceived importance of each factor in office investment depreciation.

The development of the model begins with a review of related literature in the next section of this paper. This literature review is followed by the specification of the model. Data used in developing the model is presented next. Data efficiency and bias associated with the construction of the hedonic model is discussed. The empirical results are reported and the research is summarised in the final section.

Literature Review

In property investment, depreciation rate (especially for residential property) is commonly estimated by examining price data on units of various ages (for example, Barras and Clark, 1996 and Clapp and Giacotto, 1998). The rate of change of observed property prices with respect to 'age' is interpreted as a depreciation rate. Works such as Sykes (1984), Salway (1986) and Barras and Clark (1996) also quantified the property ages as the rate of depreciation. The age-life method of estimating depreciation is one method that incorporates the above information and is often used by practising appraisers (Cannaday and Sunderman, 1984). The difficulty of determining the efficient or economic life of a property has been a major inadequacy highlighted in Baum (1989) and Md Yusof (1999). 'Age' is strongly correlated to other variables (see for example, Epley, 1990); therefore the effect of other depreciation variables, such as design cannot be separated.

Md Yusof (1999 and 1999a) proposed three main sources of depreciation: physical deterioration, building obsolescence and site obsolescence (further discussion on sources of depreciation can be found in Md Yusof, 1999 and 1999a). Physical

deterioration indicates the situation of utility declining due to physical usage and the passage of time. Physical deterioration emanates from 'use' and 'action of elements', which require the passage of time, as both 'use and action of elements' occur progressively through time. Obsolescence is a decline in property utility or usefulness (Salway, 1986 and Baum, 1989), which is not directly related to physical deterioration. The property becomes obsolete as it falls in comparative status due to factors such as technology or design of a new property. Obsolescence can be classified as building obsolescence and site obsolescence

Building obsolescence refers to a degree of mismatch between a building and its use. Building obsolescence may arise from deficiency in design, building systems, services and other factors. Site obsolescence indicates a decline in the usefulness of a site (Md Yusof, 1999 and 1999a). Factors which may cause obsolescence of a particular site or location include accessibility, site-specific, planning and environmental factors.

The attempt to incorporate different sources into the analysis of depreciation has resulted in the application of statistical tools. In Baum (1989), Hulten and Wykoff (1996), Khalid (1992) and Md Yusof (1999), a multiple regression analysis and its extension hedonic price model has been used to explain rather than predict the impact of depreciation on property investment especially when the data is analysed cross-sectionally. The main concern here is to review the causes of depreciation using the hedonic price technique. The technique has been used as a better alternative to explain different sectors in property investment analysis. The application of hedonic price technique to determine rental and house prices and the impact of the countryside characteristics on values of residential can be seen in some

cases, for example, Garrod and Willis, 1991 and 1993. In addressing the impact of depreciation, numerous studies have measured house depreciation by the coefficient on age in the hedonic regression, for example, Palmquist (1979), Linneman (1980) and Chinloy (1980). The most recent is a rational expectation framework for interpreting the coefficient on age in a standard hedonic model developed by Clapp and Giacotto (1998) for the residential sector.

In office investment, the models used to measure office performance can be linked to the analysis of depreciation as it is largely related to property performance. Hough and Kratz (1983) and Vandell and Lane (1989), for example, consider the price of good architecture in the rental determination of offices by hedonic price technique, which can be linked to depreciation in terms of method and variables used. Dunse and Jones (1998), include factors such as physical characteristics, tenure and location as those which determine the value of offices in the United Kingdom, which is also appropriate to the analysis of depreciation.

Hedonic regression is an extension of Multiple Regression Analysis (MRA), which can be applied to a series of property values, together with their associated characteristics to identify and quantify the significant determinants of value and consequently depreciation. Hedonic multivariate regression is a technique for measuring price while controlling for the quality of the heterogeneous commodities. Hedonic price is the implicit price of each attribute possessed by those goods. Each attribute contributes to the values of the good as the model specified that the good per se, does not affect the level of their utility to a consumer, but instead the good possesses attributes that increase or decrease the utility (Rosen, 1974). The interpretation suggests that the price paid for a particular good is the sum of the implicit prices of the associated attributes as the hedonic price equation is a reduced-form equation reflecting both the demand

and supply influences (Halvorsen and Pollakowski, cited by Edmond, 1984).

In this study, the hedonic model is based on the assumptions that an office user's utility is a general function of a dimensional vector of characteristics which encompasses locational and physical characteristics, the market price is known for any offices and each user maximises utility, subject to a budget constraint. In the office unit, Z , is composed of n attributes (Dunse and Jones, 1998) where $z_1, \dots, z_n$ is a vector of n attributes for which rent depends upon the quantities of the various attributes associated with Z . The rent function can be expressed as $R(Z) = f(z_1, z_2, \dots, z_n)$. The hedonic equation is estimated using regression analysis to obtain a price measure, $R(Z_k)$, the corresponding z_k for the k^{th} property which forms the equation of:

$$R(Z_k) = \beta_0 + \sum_{i=1}^n \beta_i Z_{ik} + \varepsilon_k$$

The hedonic price function may increase, decrease or be constant depending on the functional form of $R(Z)$. Despite the various advantages of hedonic analysis, some issues require careful consideration. Caution must be taken to ensure that included characteristics must be restricted to those which pertain to the good itself. A proper set of characteristics of demand and supply should be carefully examined. Other issues relate to the underlying factors that cause depreciation to vary and whether the importance of these factors will vary cross-sectionally. This is also the subject of interest that requires accurate measure of prices on a standardised bundle of office services for each locality considered. More importantly, the appropriate functional form for a hedonic price equation cannot in general be specified on theoretical grounds and the lack of a firm basis for the choice of functional form is unfortunate. This, nonetheless, does not prevent the application of hedonic price model in other studies as well as in this study.

Methodology and Research Design

This research is designed to explain the impact of depreciation on rental for offices in the city of Kuala Lumpur. It is aimed to show the perceived importance of each variable in depreciation by regressing dependent variables (rental depreciation) against two sets of independent variables; non-transformed and transformed variables. Non-transformed variables consist of original variables, which are significantly associated with rental depreciation. The transformed variables consist of factors extracted via the Principal Component Analysis. Full discussion on Principal Component Analysis performed on the similar dataset can be found in Md Yusof (1999a).

The stepwise selection is used as the method refines and combines both forward and backward selection. In stepwise method, the variables are reassessed at every stage as opposed to forward and backward where as variables are entered, they remain in the equation. The modelling process involves identifying data for analysis, building a hedonic model, specifying model and assimilating of the whole process to explain the impact of depreciation.

The Specification of the Model

The model specification includes selection of the dependent and independent variables and determining the overall functional form of the model. As mentioned earlier, two forms of hedonic model are developed in this paper. The highest rental achieved in the market is selected as a benchmark. In 1996, the prime rent was RM5.80 per square feet. The rate of depreciation is arrived as follows:

$$\text{RentalDepreciation}(\%) = \frac{[\text{PrimeRent} - \text{OfficeRent}]}{[\text{PrimeRent}]} \times 100$$

Dependent variable is the difference in rental between equivalent new, modern and prime and the subject property, consistent with other studies (Baum, 1989; Khalid, 1992; and Barras and Clark, 1996).

Selection of independent variables for the model attempts to incorporate all physical deterioration, building obsolescence and site obsolescence variables that would be required to minimise specification bias. Therefore, the selection of variables is guided by the results of previous studies and the availability of data.

A testable form of equation related to depreciation begins with a standard cross-sectional hedonic model (Rosen, 1974):

$$Y = a + b_1x_1 + b_2x_2 + \dots + b_nx_n \quad \text{or} \\ Y_i = a + b_1x_{1i} + \dots + b_nx_{ni} + e_i$$

$$\text{DepR} = a + b_1(x_1) + b_2(x_2) + b_3(x_3) + \dots + b_n(x_n)^{\text{th}} + e,$$

where the rate of depreciation at any particular time, R is a function of physical deterioration, building obsolescence and site obsolescence for the i^{th} offices. The intercept 'a' represents that portion of rental depreciation for each office that may be attributed to the overall level of depreciation. The coefficients on 'b₁' to 'b_n' are allowed to change over time. Any unexplained variation is captured by the random error e .

i) Model with original variables

In the model, rental depreciation is a function of a set of original variables

$$\text{DepR} = a + b_1(V_1) + b_2(V_2) + b_3(V_3) + b_4(V_4) + \dots + b_n(V_n) + e_i$$

ii) Model with orthogonal factors

$$\text{DepR} = \text{Constant} + b_1(\text{Fac1}) + b_2(\text{Fac2}) + b_3(\text{Fac3}) + b_4(\text{Fac4}) + b_5(\text{Fac6}) + b_7(\text{Fac7}) + b_8(\text{Fac8})$$

Any violation of the model is observed carefully. Problem of multicollinearity, normality error, linearity or heteroscedasticity is analysed through appropriate statistics. Tolerance level, for example, shows the proportion of variability which cannot be explained by other variables. The smaller the

tolerance, the larger the standard errors of the coefficient. Large standard errors of coefficient cause computational problems and are always associated with multicollinearity. The determination of the importance of the variables in the equation can be difficult if the model is affected by multicollinearity.

Data

Data for this study is derived from information on forty-nine offices in the city of Kuala Lumpur. The average rental for these offices ranged from RM3.10 to RM5.80 per square foot in 1996. The offices are located in three traditional commercial areas: Golden Triangle Area (GTA), Central Business District (CBD) and Decentralised Area (DCA). The GTA is the prime area in the city followed by the Central Business District and Decentralised Area. Rental depreciation as the dependent variable is denoted as the percentage rental difference between subject and prime offices. 'Prime' is used to indicate the highest rental achieved in the market based on the consumer theory; a good is paid the highest price for the highest utility offered (Lancaster, 1966). The selection of property characteristics or attribute is guided by the analysis of sources of depreciation. Variables selected are linked to physical deterioration, building obsolescence and site obsolescence. A total of 51 variables were collected. Nonetheless, only 31 variables, which are significantly associated with rental depreciation, are used for further analysis. The specific information on the broad categories compiled for each property is summarised under the categories of location, age of the offices, physical characteristics, services available in the building, building systems and building design according to the city of Kuala Lumpur, 'Guideline on Office Classification' (DBKL).

In addition to the original variables, eight components are also used to explain the impact of depreciation based on three sources of depreciation: physical deterioration, building obsolescence and site obsolescence. The components, which were extracted via the Principal Component Analysis, represent the underlying constructs of thirty-seven office characteristics collected (Md Yusof, 1999a). Principal Component Analysis is performed on 31 variables, aimed to summarise and reduce the number of independent variables. The use of a large number of independent variables can create a number of problems such as multicollinearity. Principal Component Analysis, however, eliminates multicollinearity problem, which can be easily observed when variables are strongly linked to each other. The problem of multicollinearity may cause difficulty in determining causal variables in the model, as the independent variables are closely associated among themselves.

Eight orthogonal factors derived in the Principal Component Analysis are:

- i. The quality of building (BldQty),
- ii. Size and efficiency (SizeEff),
- iii. Design and lay-out (DesLay),
- iv. Location (Locat),
- v. Appearance (Appear),
- vi. Complementarity (Compl),
- vii. Facilities (Facil),
- viii. Parking services (Park).

Empirical Findings

The first stage of the analysis involve performing different methods of selecting variables. Stepwise selection provides extra advantages over forward selection and backward elimination. The included independent variables are reassessed at every step of the model development, ensuring the significant variables remain.

Two models with different sets of independent variables are presented as follows:

Model with original variables

Only variables which are statistically significantly associated with rental depreciation are selected for further analysis. Thirty-seven variables are regressed with rental depreciation. Eight variables included in the model are 'Age', 'Bay_rate', 'Ex_fin', 'Fl_fin', 'Plratio', 'Schrg', 'Stry' and 'Ty_con'. The model is developed using eight variables, which explain 82.86 per cent of variation in DepR. The adjusted R^2 of the model is 79.25 per cent. The equation can be rewritten as:

$$\text{DepR} = 49.27 + 0.34 (\text{Age}) - 2.02 (\text{Bay_rate}) - 1.02 (\text{Exfin}) - 2.534 (\text{Fl_fin}) - 0.557 (\text{Plratio}) - 21.491 (\text{Schrg}) - 0.161 (\text{Stry}) + 2.72 (\text{Ty_con})$$

There is no site-related factor included in the equation, which means that the aim to consider site obsolescence may not be achieved. Further statistical tests are carried out and relevant statistics are observed. The associated F-test shows that there is a significant relationship between the dependent and the entire set of independent variables. With eight variables, the model explains 82.86 per cent of variation in DepR. Adjusted R^2 is used to compare equation fitted not only to a specific set of data and two or more entirely different sets of data. In this case, adjusted R^2 fall to 79.25 per cent, which indicates the ability of the model as decreasing.

The equation can be read as, for example, one unit of 'age' contributes 0.34 per cent of rental depreciation. The largest variation in rental depreciation is due to 'Schrg', which means that as increases, charges will increase. The main concern here is that 'service charges' neither represents nor indicates any depreciation factors.

Furthermore, although most variables indicate correct magnitude of association (the better quality of variables minimise depreciation), 'Ty_con' displays different pattern of association. An error is suspected in the model. There is no variable related to site hence there is no scope to consider the impact of site obsolescence. In addition to this, it is shown that the equation is seriously affected by multicollinearity (see Exhibit 1.0A). Low tolerance level indicates the problem. As a result, the model with original factors/variables is not favoured in the study.

Model with orthogonal factors

The DepR model is developed with seven orthogonal factors.

$$\text{DepR}_{\%} = 15.61 - 5.202 (\text{BldgQty}) - 3.438 (\text{SizeEff}) - 1.557 (\text{DesLay}) - 3.143 (\text{Locat}) - 1.947 (\text{Compl}) - 1.587 (\text{Facil}) - 1.515 (\text{Parking})$$

i. Classification

In Md Yusof (1999 and 1999a), it is suggested that physical deterioration is related to the normal wear and tear of mechanical and electrical systems. The rate of deterioration depends on the level of use and the quality of the materials used. In the analysis, the components 'BldgQty' (Building Quality) and "SizeEff" (Size and Efficiency) can be classified as physical deterioration-related factors. "Design, Facil and Park" can be building obsolescence factors. Nonetheless, it is important to realise that this is not an ultimate classification, as 'SizeEff' and 'BldgQty' may also influence building obsolescence and vice-versa. The only possible difference between them is that physical deterioration is concerned with wear

and tear but obsolescence is more related to qualities which correspond to changes in demand. In the study, site obsolescence is described by 'Compl' (Complementarity) and 'Locat' (Location). The factors can be used to show the relative impact of site obsolescence.

ii. Variables inclusion

The model incorporates multiple variables which is different from Sykes (1984), Harker (1985) and Salway, (1986). In these studies, 'Age' is the only explanatory variable. A summary of the model is shown in Exhibit 1.0A.

The first factor entered into the equation is 'Building Quality'. 'BldgQty' explains 32.22 per cent of variation in rental depreciation for the selected offices in the city of Kuala Lumpur in 1996. This further shows that rental depreciation was reduced by 5.2 per cent with an increase in one unit of 'BldgQty', as shown in the DepR model.

An increase of 15.19 per cent of variation in DepR is caused or explained by 'SizeEff'. Here, the size of the space and the level of efficiency offered by the property influence more than 15 per cent of office rental depreciation. In other words, high-rise buildings with efficient services are preferred and, therefore, a higher rental could be expected (hence low rental depreciation). In the model, a unit increase in 'SizeEff' decreases rental depreciation by 3.44 per cent.

Additional variables such as 'Locat' and 'Compl' explained a further variation in rental depreciation. Although the contribution of each

component is still considered significant, it is obvious that as more variables enter the equation, the marginal contribution of each decreases steadily. The role of each factor in minimising depreciation becomes less. Exhibit 1.0B summarises the contribution of factors in the model.

The above discussion shows that with seven factors or components, 73.78 per cent (adjusted to 69.07 per cent) of variation in rental depreciation in 1996 is explained. The remaining 26.22 per cent (adjusted to 30.93 per cent) is however due to factors which were collected but are not in the equation or were not collected or observed during the proforma survey. This includes the micro aspect of location, which could explain further variations in rental, and consequently depreciation.

iii. Violations checking

The model is checked for any violations that may result in inconsistent findings. The following have been undertaken:

Heterogeneous Variance: It is always assumed that errors of variance of regression models are homogeneous. The assumption of a homogeneous error of variance, as suggested by Myers (1989), is often violated in practical situations. This occurs because as numbers of either dependent or independent variables increase, the variation around the trend of fitted models becomes larger. To investigate if the error variance is homogeneous, One-Way ANOVA was performed and is discussed. With the one-way test of equality of variance, the hypothesis

is that all residuals from which the random samples are taken must not only be normal but must also have the same variance. Here, if the significance levels are relatively large, the hypothesis that the populations have the same variance cannot be rejected. In case of DepR, the result of the test indicates a significance level of 0.2022. Thus, for the model there is no danger of violation in terms of equality of variance.

Non-normal error: In regression analysis, the error is assumed to be normally distributed. Kolmogorov-Smirnov and Shapiro-Wilks tests check the normality assumption. Again, although it is possible to test normality using a histogram of standardised residual to visualise the error distribution, it has poor resolution in the tails or wherever data are sparse.

The Kolmogorov-Smirnov test is used to test how well a random sample of data fits a particular distribution (uniform, Normal and Poisson). It is based on the comparison of the sample cumulative distribution function to the hypothesised cumulative distribution function. If the D statistic is significant, then the hypothesis that the respective distribution is normal should be rejected. The result of the test indicates high significance levels, D-statistics for DepR model (0.9379) suggesting that error terms for the models are normally distributed. The normality error distribution is further justified by a high significance value of Shapiro-Wilks as another test of normal distribution. The Wilks statistic is 0.5327 for DepR and the result of the test proves that the error for the model is normally distributed.

Outliers: Outliers are problems of individual data points that do not fit the trend set by the balance of the data. The model violations may produce a suspicious data point on two occasions, (i) there is a breakdown in the model at the i th point, producing a location shift, $E(e_i) = D_i \neq 0$, which is known as the mean shift outlier model, and (ii) there is a breakdown in the model at the i th point and $\text{Var}(e_i)$ exceeds the error variance at the other data locations. In the statistical package, the outlier cases are those with residuals greater than ± 3 . However, in this study, a standard deviation of ± 2.5 has been used as well as ± 3 . There are no outliers for DepR in both, when ± 2.5 and ± 3 , standard deviations were used.

Appropriate statistical tests have been performed to detect any violation in the model. There is no evidence to suggest that violations exist in the model thus it can explain depreciation based on the information collected.

Conclusions and Recommendation

The analysis of rental depreciation indicates that for the selected Kuala Lumpur offices, the levels of depreciation ranged from 1.2 per cent to 33.6 per cent in 1996. The study shows that the level of risk associated with the city's offices is a function of changes in demand for and supply of better quality offices. The study of decline or loss in value, in terms of rental was undertaken in 1996, aimed to explain the impact of depreciation based on three sources of depreciation: physical deterioration, building obsolescence and site obsolescence. Although the attempt to model each factor separately has not been successfully undertaken, the hedonic price model shows that physical deterioration and

building obsolescence have been the major causes of depreciation for offices in the city of Kuala Lumpur. This, nonetheless, does not negate the importance of site obsolescence in the city's office depreciation. When the offices are considered based on location, the analysis shows less systematic influence of the site factor but there is scope for cancelling the severe impact of building obsolescence and deterioration for offices in the Golden Triangle Area only, as the impact of site obsolescence is low.

The study indicates that Kuala Lumpur office depreciation is greatly influenced by differences in building characteristics. The differences are attributed to variations in construction technology to respond to changes in working styles. The requirements of office occupiers change over the 1980s where demand for modern offices became significant. The finding of this study is similar to some tenant's survey (for example, Valuation and Property Services, 1992) where the building components were rated above location or site-related variables. This indicates that the role of site becomes less dominant as evident from by hedonic pricing for site related factors, which are less significant, compared to those related to building. It was found that good locations might not necessarily lower the level of depreciation. However, the combination of good location and good buildings may decrease the impact of rental depreciation.

Nonetheless, as the study has been undertaken cross-sectionally, the effect of temporal variation has not been considered. The level of the general economy, for example, may change the perceived importance of variables selected in the model discussed earlier. Further research should be undertaken to test the validity of the depreciation model under the current economic scenario.

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EXHIBIT 1.0

1.0A A Summary of Stepwise Selection

DEPENDENT VARIABLE: DepR

Multiple R 0.91026
R Square 0.82858
Adjusted R Square 0.79249
Standard Error 4.08027

Variable	B	SE B	Beta	Tolerance	VIF	T	Sig T
Age	0.3404	0.138	0.245	0.457	2.189	2.465	0.0183
Bay-Rate	-2.0231	0.862	-0.187	0.789	1.267	-2.477	0.0178
Ex_fin	-1.0167	0.587	-0.172	0.457	2.184	-1.732	0.093
Fl_Fin	-2.535	0.571	-0.332	0.855	1.169	-4.437	0.0001
Pl_Rat	-0.557	0.252	-0.171	0.754	1.329	-2.215	0.0328
S_Chrg	-21.492	4.06	-0.452	0.617	1.621	-5.289	0.0000
Stry	-0.161	0.078	-0.184	0.573	1.744	-2.073	0.0450
Ty_con	2.717	1.052	0.260	0.443	2.253	2.582	0.0138
Constant	49.273	5.116				9.631	0.0000

Notes:

- 1) B is regression coefficient- the relative importance of variables
- 2) SE B is Standard Error of Coefficient
- 3) Beta is the standardised regression coefficient
- 4) Tolerance -Variance of Estimators
- 5) VIF- Variance Inflation factor
- 6) T statistic
- 7) Sig T - observed significance level

1.0B A Summary of Multiple Component Regression Analysis

DEPENDENT VARIABLE: DepR					
Multiple R	0.85893				
R Square	0.73776				
Adjusted R sq.	0.69069				
Standard Error	4.98157				
Analysis of Variance					
	DF	Sum of Squares	Mean Squares		
Regression	7	2722.80374	388.97196		
Residual	39	967.82435	24.81601		
F = 15.67424	Signif F = .0000				
Variable	B	SE B	Beta	T	Sig T
(Fac1-BldgQty)	-5.203	0.741	-.576	-7.016	.0000
(Fac2-FffSize)	-3.438	0.729	-.387	-4.718	.0000
(Fac3- DesLay)	-1.557	0.720	-.177	-2.164	.0366
(Fac4- Locat)	-3.143	0.727	-.355	-4.323	.0001
(Fac6- Compl)	-1.947	0.728	-.219	-2.674	.0109
(Fac7- Facil)	-1.587	0.733	-.178	-2.167	.0364
(Fac8- Parking)	-1.515	0.720	-.172	-2.104	.0419
Constant	15.614	0.728		21.452	.0000

1.0C A List of Variables in The Study

Labels	Description
1. Ac_sys	Air-conditioning system in the building. The variable is measured by score with higher values for better and modern systems.
2. Ac_fl	The variable indicates whether the air - conditioning system is equipped with the latest feature of system; Variable Air Volume. The score is indicated by Yes or No.
3. Access	The variable used to describe the accessibility of the property from the main road and public transport
4. Age	Age of the building
5. DepR	Annual Depreciation on Rent
6. Dep Y	Annual depreciation on Yield
7. Bas	Explains the state of the building automation system of the building.Modern or best system denoted by higher scores.
8. Bay	Number of parking spaces provided in the building
9. Bay_rate	Indicates percentage provision of parking spaces based on floor area and space ratio
10. Big_spac	The biggest space occupied by a single tenant in the building
11. Bigs_ten	Number of bigger tenants occupying space of 5,000 square feet and above
12. Ce_high	Measured floor to ceiling height, more or less than 10 feet
13. Comm	Telecommunication system in the building
14. Cm_ref	Shows whether a common refreshment area is available in the building
15. Conf	Conference hall or room in the building
16. Cr fin	The state of architectural finishes of lift car
17. Dine	Dining facility
18. Ex_fin	External finishes of the building

19. Fn_com	Tenants profile - Finance Companies
20. Fire	Fire prevention system of the building
21. Fl_area	Gross floor area of the building, denoted by several categories
22. Fl_fin	Building floor finishes
23. Gen_com	Type of the ownership -general commercial
24. Govtagen	Tenants profile -Government agency
25. Gym	Gynmasiumfacility
26. Int car	Car interval movement
27. Lascap	The state of landscape in the building
28. Ld_area	Land area of the property
29. Lif car	Number of lift cars
30. Lif_con	The control system for the lift
31. Locat	Location of the property - Three commercial areas in Kuala Lumpur used
32. Mj_Inst	Type of ownership - Major institution
33. Numten	Number of tenants in the building
34. Occrate	Occupancy rate of the building
35. Owrel	Relationship to owner
36. Plratio	Plot ratio of the property
37. Profser	Tenants profile - professional service
38. Prox	Proximity to other uses such as retail
39. Rd_fr	Is the property situated on road frontage
40. Re_count	The state of reception counter in the building
41. Refur	Any refurbishment undertaken
42. Rnt_rev	Rent review interval
43. Schrg	Service charge, measured as a fraction of gross rent
44. Security	Security system of the building
45. Sp-utl	The space utilisation (Column free, etc.)
46. Spd_car	The speed of the lift cars
47. Stck_br	Tenants profile -Stock broker
48. Stry	Number of storeys
49. Trdagen	Tenants profile - Trade agent
50. Ty_bay	Type of bay provided in the building
51. Ty_con	Type of construction - modern, transitional or traditional
52. Use_lev	The intensive use, based on type of business and number of tenants
53. Wait_car	The average waiting time during peak hours