Evaluation of the Application of Hedonic Pricing Model on residential Property Appraisal by Valuers in Port Harcourt Metropolis.

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ABSTRACT
Hedonic Pricing Model (HPM) in simple terms could be said to mean the assessment of the price of individual attributes in a real property so as to know the true value of the property. Real property has been described as a composite good made up of various attributes or characteristics which is priced to arrive at its true value. The hedonic pricing model is a model used to determine the various values of individual attributes that directly affects market price of goods. This model has been revealed not to be commonly used by valuers in Port Harcourt metropolis in the valuation of real estate's despite its ability to reveal the strength of all variables that determine property value. The study used 184 registered valuers out of the 340 registered valuers as recorded in the Rivers State branch of the Nigerian Institution of Estate Surveyors and Valuers Directory of 2020. The study sampled their opinions on the use of hedonic pricing model in the appraisal of residential properties and observed that the awareness level of the hedonic pricing model by valuers in Port Harcourt metropolis as a method of valuation for residential property is low. The study also observed that HPM is not used in the valuation of real property by valuers in Port Harcourt metropolis therefore making the benefits of the model to elude property developers and valuers. The study recommends the introduction of regression analysis as part of courses to be taken by estate management students in the university so as to equip them with the required skills for analysis when needed and that the Nigerian Institution of Estate Surveyors and Valuers (NIESV) in conjunction with the Estate Surveyors and Valuers Registration Board of Nigeria (ESVARBON) should introduce trainings in the Mandatory Continuous Professional Development (MCPD) on these models of valuation to equip valuers with the knowledge of using them in the valuation of real property.

KEY WORDS: Hedonic Pricing Model, Real Property, Appraisal, Valuers, Port Harcourt Metropolis, Real Property**.**

I.   INTRODUCTION
Hedonic pricing model in simple terms could be said to mean the assessment of the price of individual attributes in a real property so as to know the true value of the property. Real property has been described as a composite good made up of various attributes or characteristics which is priced to arrive at its true value. The hedonic pricing model is a model used to determine the various values of individual attributes that directly affects market price of goods.

Different scholars have given various histories as to the origin of the model. In the study of Malpezzi (2003), he opined that Court (1939) is most times cited as the "Father" of hedonic pricing model, even though the study was mainly to assess the variables that affect the demand for automobiles. He found out that more variables were needed to explain the demand for automobiles. Other studies like that conducted by Colwell and Dillmore (1999) opined that Haas (1922) and Wallace (1929) had used the model on the value of farmland. The study of Lancaster (1966) contributed to the hedonic pricing model by providing a basis for estimating the value of utility-generating housing attributes.

The hedonic equation by Sirmans and Macpherson (2003) is; the study of Rosen (1974) focused on these housing attributes with less emphasis on utility but rather more concerned on

price determination. The study of Rosen provided the basis for nonlinear hedonic pricing model.
Price = f (physical characteristics, other factors)

In this equation by Sirmans and Macpherson (2003) it simply means that the price of real property is a function of its physical characteristics like (age of building, location, number of bedrooms, other amenities and factors such as security, parks, bus stops, neighbourhood churches etc.). When these variables are regressed, the estimate got from it gives the implicit prices of each attribute. They went further to say that these estimates may not be the same for all types of houses depending on their price range. The study gave an instance that the value a bedroom would add to a house priced $500,000 might be greater than the value it would add for a $100,000 priced house. This means that the variables that are likely to influence the price of real property will vary depending on the class of the house, income and even desire.

The study aims at evaluating the application of the hedonic pricing model by valuers in Port Harcourt metropolis in the valuation of residential properties.

II. STUDY AREAS

The study used valuer's practicing in Port Harcourt metropolis which consist of Port Harcourt city and Obio Akpor local government areas. Port Harcourt is the capital of Nigeria's Rivers State. It is located in the Niger Delta, along the Bonny River. The Port Harcourt urban area has a population of 1,382,592 people, according to the 2006 census. Before 1912, the area that became Port Harcourt was part of the Diobu village group of the Ikwerre ethnicity's farmlands. The port was developed by the British colonial authority of Nigeria to transport coal from the Enugu collieries, which were located 243 kilometers (151 miles) north of Port Harcourt and connected by the Eastern Line, which was also built by the British.
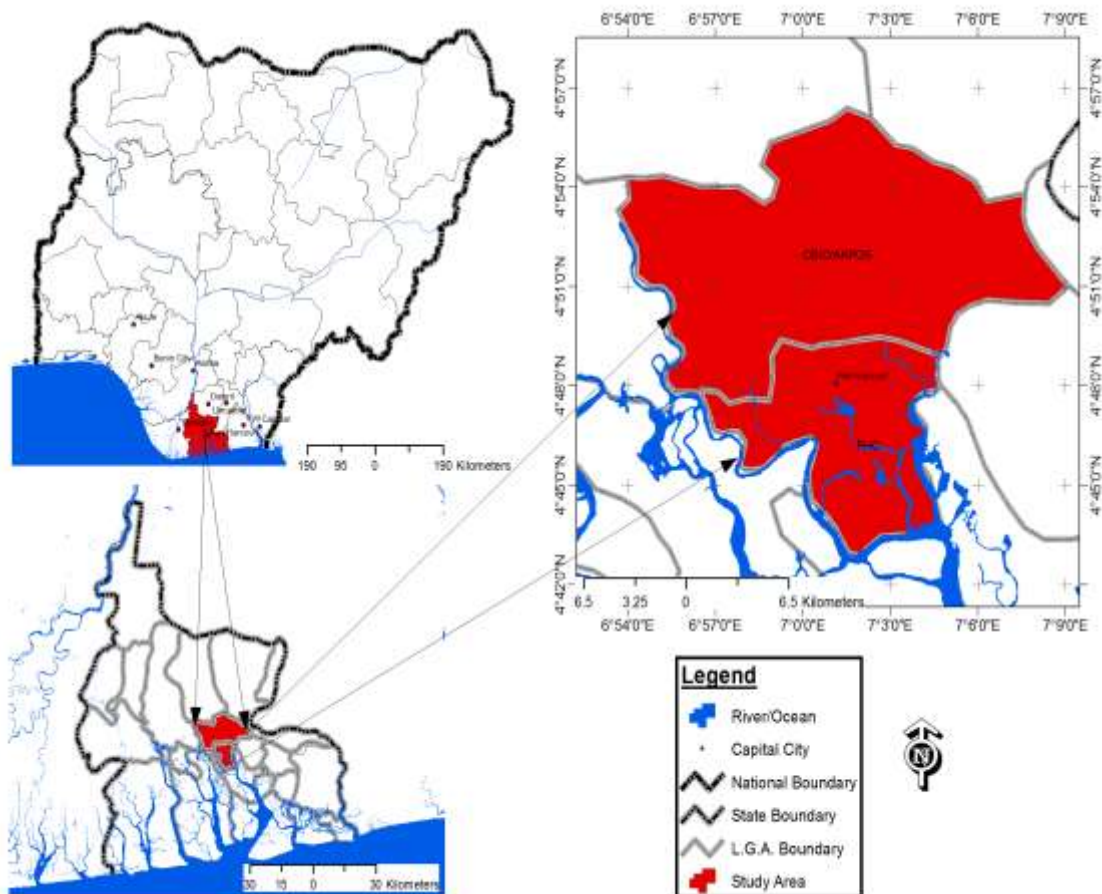

Figure 1.1:Map of Nigeria showing Rivers State (fig.1.1a), map of Rivers State showing Port Harcourt metropolis (1.1b) and map of Port Harcourt metropolis (1.1c)
Source: URP GIS LAB. RSU, PORT HARCOURT, 2021

III. LITERATURE REVIEW

Hedonic pricing model is used to assess the price of individual attributes by using multiple regression analysis on a pooled variables of different dwellings. From the findings of Sirmans and Macpherson (2003) it is assumed that investors in real property derive satisfaction from the various housing attributes which in turn defines value. This means that the value derived from such satisfaction can also be priced to get the true value of the building in totality.

Due to the importance attached to real property investment, it is relevant to assess the value of real property in order to give its true value to both the investor and the consumer. This importance has led to several researches on the determinants of real property values using the hedonic pricing mode around the world. The model assesses the prices of the characteristics that are present in a property so as to arrive at its true value and also assess the levels of impacts of these determinants on real property values. The model was recommended by Rosen (1974) to show the way market for differentiated goods which real estate is one works.

Pace, Sirmans and Slawson (2001) opined that "traditional hedonic pricing models, based upon an impressive corpus of statistical and economic theory often exhibits prediction errors with a standard deviation in the range of 28-50%." They observed that for the hedonic pricing approach to perform optimally, a reasonable number of independent variables should be analyzed with the dependent variable to produce nearly independent regression residuals in large samples. The study went further to note that primarily, hedonic pricing involves the use of many variables which can affect the quality of its predictions. The use of many variables at the same time can lead to the regression prediction. Study conducted by Soderberg (2001) reveals that the hedonic technique is a tool that is well grounded for the determination of property prices for single-family housing.

Hedonic Pricing Model was first applied in property price appraisal in the early 1920s (Abidoye and Chan 2017). It is worthy of note that the hedonic pricing model though widely applied in other real property markets of the world was first applied in Nigeria (Megbolugbe, 1986) using the city of Jos, Nigeria. Abidoye and Chan (2017) observed that most of the valuers who applied or know about the HPM are academics and proposed a need to bridge the gap between theory and practice.

The results that emanate from the application of the hedonic pricing model are usually specific to a particular location thereby difficult to generalize across different geographic locations but can help in establishing the housing attributes that consistently affect values positively or negatively. The need to access the attributes that influence values of real property has led to many researches and notable amongst the researches is the study done by Tse and Love (2000) on "Measuring Residential property values in Hong Kong". Using the hedonic pricing model, the study identified four groups of attributes that determines real property values and they are structural, physical, neighbourhood characteristics and environment. Most of the researches carried out observed different attributes that influence real property values. The hedonic pricing model therefore can be said to help an investor in real property gain insight on the workings of a particular market or area. It has been useful in addressing some issues in housing valuation. Hedonic Pricing Model has the ability to reveal the strength of all variables that determine property value which may be of interest to real estate investors and other real estate stakeholders

IV. METHODOLOGY

The survey design was employed for information gathering from the respondents. The study applied 5 point Likert scale questionnaire and it was ranked as Never-1, Rarely-2, Sometimes-3, Often-4, Always-5 and Not at all aware-1, slightly aware-2, somewhat aware-3, Moderately aware-4, Extremely aware-5. The sample size for this study was 180 registered valuers in Port Harcourt metropolis but 140 questionnaires retrieved and relevant to the study were actually used for analysis. The data so obtained were analyzed for all purpose and understanding. In the analysis of the quantitative data collected, descriptive statistical tools like tables, cumulative means, frequencies and percentages were used.

V. FINDINGS AND INTERPRETATION

In order to ascertain the reliability of the respondents answers to the research questions, the years of experience of the valuers were sought.

Table 1 Years of practice as professional valuer.

Years of practice	Frequencies	Percentages
0-5	17	12.1
6-10	39	27.9
11-15	57	40.7
16-20	16	11.4
20+	11	7.9
Total	140	100

Source: Field survey (2021)

The responses on table 1 reveals that the valuers who had 0-5 years of experience were 17 in number been 12.1% and valuers who had 6-10 years of experience were 39 and those with 11-15 years of experience were57 in number. This indicates that the valuers are well experienced and vast in real estate practice to give reliable information.

Table 2: Awareness of valuers on use of the Hedonic Pricing Model.

Level of awareness	Frequency	Percentage
Not at all aware	86	61.5
Slightly aware	10	7.1
Somewhat aware	8	5.7
Moderately aware	16	11.4
Extremely aware	20	14.3
Total	**140**	**100**

Source: field survey (2021)

From table 2, the responses of the valuers indicates that 61.5% representing 86 respondents are not aware of what hedonic pricing model is while 20 been 14.3% of the respondent valuers claimed to be extremely aware of the hedonic pricing model. This finding indicates that valuers in the study area do not even know what the hedonic pricing model represents. However, 20 of the valuers which represent those respondents who agreed to be extremely aware were found to be academics and these findings corroborates the findings of Abidoye and Chan (2017) who also proposed a need to bridge the gap between theory and practice.

Table 3 Indicates valuers response to valuation methods used to access Value of Land and Building

	Never	Rarely	Sometimes	Often	Always	Total
	N percent	N percent	N percent	N percent	N percent	100.0
Comparable Sale Method (COMPM)	0 0.0	0 0.0	63 44.8	61 43.8	16 11.4	100.0
Depreciated Replacement Cost (DRC)	0 0.0	0 0.0	3 2.1	66 46.9	71 51.0	100.0
Income Capitalization Method (INCM	0 0.0	28 19.8	19 13.5	90 64.6	3 2.1	100.0
Discounted Cash Flow Method(DCF)	21.4	3 2.1	5438.5	80 57	1 1.0	100.0
Hedonic Pricing Method (HPM)	7251.4	32 22.9	0 0.0	3625.7	0 0.0	100.00
	Combine Cumulative Average for Never,		Combine	Cumulative		

Rarely and Sometimes 38.74	Average for Often and Always 60.8

Source: Field Data, 2021

Table 3 above indicates that none of the valuers accepted that they never used Comparative method, Depreciated Replacement Cost method, and Income method to value for land and building. This revealed that valuers are comfortable with the conventional valuation method. The respondents said they never use the Income method to value land and building.

For the use of the Hedonic Pricing Model (HPM), 51.4% representing 72 responses agreed to never using the HPM, 22.9% representing 32 respondents said they rarely used the method while none of the respondents admitted to using the method sometimes or always. On the use of the method often, 25.7% of the valuers representing 36 of the respondents agreed that they use the method often. This reveals that the valuers in Port Harcourt metropolis do not frequently use the hedonic pricing model in their valuation of land and building.

Table 4 Showing ranking of responses on valuation methods used.

Valuation method	Never	Always	Rank
COMPM	0	140	1st
DRC	0	140	1st
INCM	28	112	2nd
DCF	5	135	3rd
HPM	104	36	4th

Source: Field Data (2021)

Table 4 above ranked the responses of the valuation methods used by valuers on two extremes of "Never" and "Always". It indicates that the 140 respondents agreed to using the Comparable Sale method and the Depreciated Replacement Cost method always and these two methods rank 1st. The responses indicate that 28 responses agreed to never using the Income approach to value land and building, 112 of the responses indicates to using the Income approach always. The Income method rank 2nd position. The DCF and HPM ranked 3rd and 4th respectively. This finding is indicative of the lack of use of HPM as a method in the valuation of residential real property and this could be as a result of majority of the respondents not being aware of the HPM and the use of computer analysis for its computation which some respondents may not want to go through which should not be so at this computer age.

Table 5 Valuers responses on whether the hedonic pricing model should be adopted or the current methods used to be continued.

	Strongly (1) N	Disagree %	Disagree (2) N %	Neutral(3) N %	Agree (4) N %	Strongly agree (5) N %	Mean
Adopt Hedonic Pricing Model	20 14.3		10 7.1	81 57.9	24 17.1	5 3.6	2.89
Current valuation methods used are adequate	0	0	13 9.3	23 16.4	70 50	34 24.3	3.89

Source: Field Data (2021)

The study also sought to know if the valuers would like to adopt the HPM or continue with the existing valuation methods used, their responses are as seen on table 5 abovewhich reveals that 50% representing 70 of the valuersagreed that the current methods used in the valuation of land and building is adequate and should be continued. While 3.6% representing 5

responses indicates that the hedonic pricing model should be adopted. It is observed that 57.9% of the respondents representing 81 of the valuers gave neutral responses on if the hedonic pricing model should be adopted. This study reveals that the valuers are comfortable with the current valuation methods used and would prefer to continue with them. The reasons may be due to the statistics involved in its application which valuers are not conversant with as such cannot be adopted easily by valuers in Port Harcourt metropolis.

VI.   CONCLUSION
The study noted that the awareness level of the hedonic pricing model by valuers in Port Harcourt metropolis as a method of valuation for residential property is low. It also observed that the HPM is not applied in the valuation of real property by valuers in Port Harcourt metropolis, thereby making the benefits of the model to elude property developers and valuers.

VII.   RECOMMENDATIONS
This study recommends that there should be development of research capability by the valuers to ascertain real property attributes required by buyers since value is mostly affected by what the buyer of real property requires which will increase the price of the property. It also recommends the introduction of regression analysis as part of courses to be taken by estate management students in the university to equip them with the required skills and rudiments for analysis when desired.

Finally, the study recommends thatthe Nigerian Institution of Estate Surveyors and Valuers (NIESV) in conjunction with the Estate Surveyors and Registration Board of Nigeria (ESVARBON) should introduce trainings in the Mandatory Continuous Professional Development (MCPD) on these models of valuation to equip valuers with the knowledge of using them in the valuation of real property.

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