

Determinants of Elderly Housing Prices in the Bangkok Metropolitan Region based on Hedonic Pricing Model

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— *Review of* —
**Integrative
Business &
Economics**
— *Research* —

ABSTRACT

This study aimed to analyze the factors affecting elderly housing prices in 2021. The data were obtained from 114 areas in the Bangkok Metropolitan Region (BMR). The hedonic pricing model was used to identify the determinants of elderly housing prices based on different attributes. Findings revealed that the estimated prices were determined by two attributes (i.e., structural and locational attributes). Specifically, structural attributes had a stronger impact on prices than locational attributes. In addition, contracts based on ownership type and period were the most crucial factor influencing price changes in elderly housing. For instance, if the elderly were tenants, then prices would be about three times higher than if they were homeowners. In addition, short-term tenants would cost more than long-term tenants owing to the economy of scale. In terms of nursing services, high prices were paid for immediate nursing services owing to care services and health status. The policy implication is that the government should encourage individuals to save for housing before their retirement because the results show the elderly's increasing expenditures owing to nursing services.

Keywords: Demand for elderly housing, Hedonic pricing model, housing price.

Received 16 February 2023 | Revised 20 April 2023 | Accepted 1 May 2023.

1. INTRODUCTION

The age structure of the Thai population changed dramatically in the past 50 years, from young people to old people. In 1970, Thailand's elderly population (individuals aged 60 years or over) was only 1.7 million or 4.9% of the total population, but in 2020, the elderly population increased to 12 million, accounting for 18.10% of the total population. In 2022, Thailand became "a completely aged society," which means that it took Thailand 17 years, from 2005, to become an aging society. Moreover, Thailand experienced a tsunami of births between 1963 - 1983 (in 1963, the number of births exceeded a million), and those born in the first year of that period will be among the elderly in 2023 (Situation of the Thai Elderly Report, 2020).

Meanwhile, the Thai aging population will continue to increase, whereas the young population (0–14 years) and working-age population (15–59 years) will continue to decline. The proportion of young people (0–14 years) in the total population is expected to decrease from 16.90% to 12.80% by 2040. Similarly, the proportion of the working-age population in the total population declined from 65% to 55.80% (NESDC, 2019).

Therefore, a study on appropriate elderly housing for the late elderly in need is crucial for the aging population. The elderly who live alone, including patients, demand elderly housing at the end of their life. In addition to the living conditions and health status of the elderly, which can determine their need for housing, one crucial factor affecting their decision to avail of elderly housing is price. The price of housing is part of the elderly's decision making, who choose suitable housing for themselves based on their health status and ability to pay.

In general, housing is a type of heterogeneous goods in the market and will result in different prices based on the housing characteristics. The price of housing is determined by related factors such as the type of operator (government or nongovernment), location, surrounding environment, housing structure, and so on. However, housing for the elderly is different from public housing because the elderly require physical care and assistance in their daily activities owing to their changing physical condition. Therefore, elderly housing prices derive from not only the factors mentioned above but also embedded nursing services and long-term care.

Furthermore, researchers are interested in examining the factors involved in housing pricing for the elderly and how such factors will affect the prices of elderly housing differently from those of residential homes. Such research can also serve as a guideline for the elderly in preparing for potential housing service expenses in the future.

This study intends to analyze the factors influencing elderly housing prices in the Bangkok Metropolitan Region (BMR) based on the hedonic pricing model (HPM). The BMR refers to six provinces, consisting of the Bangkok Metropolitan Administration and five adjoining provinces, namely, Nonthaburi, Pathum Thani, Samut Prakan, Nakhon Pathom, and Samut Sakhon.

This study aims to present the literature on demand for elderly housing and identify the determinants of elderly housing prices in the BMR. The rest of this paper is organized as follows: Section 2 reviews the literature and introduces the theoretical framework, Section 3 describes the data and methodology, Section 4 reports the results, Section 5 summarizes the conclusion, Section 6 provides a discussion, and Section 7 offers recommendations.

2. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Literature review

2.1.1 Stages of life cycle

The human body changes significantly from childhood to adulthood, including in old age. Changes in physical characteristics are the most important determinants of human life demand, which depend on age (The Human Life Cycle, 2020).

2.1.2 Conditional health states and elderly preferences

Classification of the elderly is suitable for long-term health promotion activities, covering target and potential groups, according to the Department of Health, Ministry of Public Health, and network partners and experts. Such classification is applied based on the criteria for assessing ability to carry out activities for daily living (ADL) of the Barthel ADL index, with a total score of 20 points, as follows:

- Elderly group No. 1 refers to the elderly who are self-reliant and can help others in the community and society (also called the “social group”), with a total ADL score of 12 points or higher.

- Elderly group No. 2 refers to the elderly who can take care of themselves in certain situations (also called the “home group”), with a total ADL score ranging from 5 to 11 points.
- Elderly group No. 3 refers to the elderly who are not self-reliant and are unable to help themselves or handicapped (also called the “bedridden group”), with a total ADL score ranging from 0 to 4 points.

2.1.3 Type of elderly housing

Many Thai elderly live in their family home. However, they may move to an institutional or nursing home because of changing life conditions, such as their health, family status, and so on. Residential homes can be divided into several types, as presented in Table 1 (Department of Business Development, Ministry of Commerce, 2021).

2.1.4 Type of operator

2.1.4.1 Institutional government housing for elderly

The first government-sponsored home for senior citizens in Thailand is Bang Khae Home, which opened in 1953. Over time, Bang Khae Home expanded its function from offering primary housing to the elderly to providing comprehensive social services. Potential residents must be a Thai citizen aged 60 years or older who voluntarily wish to reside in the home and have no other viable means of support. Residents must also be free of dangerous infectious diseases, severe disabilities, or mental illnesses. Most of its residents consider the home as their last resort. The home also strictly enforces numerous regulations for its residents (Situation of the Thai Elderly report, 2015).

In Thailand, the Department of Social Development and Welfare manages facilities for the elderly who are homeless, impoverished, abandoned and lacking care providers of their own, and suffering from challenging circumstances. Residency in such facilities is voluntary, and the department has expanded its support to providing social services, recreation, clinical care, physiotherapy, and so on. Currently, such facilities are referred to as Service Center for Older Persons or Social Welfare Development Center for Older Persons. The Ministry of Social Development and Human Security (MSDHS) is directly responsible for elderly welfare. The MSDHS delivers services to the elderly through regional elderly social development and welfare centers. At present, 12 provinces have an MSDHS Social Welfare Development Center for Older Persons.

2.1.4.2 Private housing for elderly

Entrepreneurs have taken an interest in the implications of an aging society and identified the market potential of goods and services tailored to the elderly. For example, some businesses developed planned communities for senior citizens, home-based care services, geriatric clinics, and so on. However, alternative housing and care in the private sector may entail considerable costs. Prospective elderly consumers and their families must weigh the costs and benefits of such facilities/services (Situation of the Thai Elderly report, 2015). Therefore, private residential homes for the elderly are an alternative option for those with adequate income to purchase such convenient facilities.

In the business sector, the number of private residential homes for the elderly increased following the aging society situation. The Department of Business Development of the Ministry of Commerce (2021) reported that many entrepreneurs are involved in providing long-term care services. Since 2018, when elderly care businesses

were first established, they have increased continuously. In 2019, the number of such businesses grew by more than 50% compared with that in the previous year. During the first quarter of 2021, the number of such businesses increased by more than 79% compared with that in the first quarter of 2020. Total business revenues also grew continuously from 2017 to 2019. In 2019, such businesses earned a profit of THB 11.05 million, which was an increase of 1.6 times from the earned profit in 2018.

2.1.4.3 Nongovernment organizations (NGOs)

Many residential projects for the elderly have been implemented in Thailand, such as “swang-ka-ni-ves,” which are elderly homes under the supervision of the Thai Red Cross Society, which is a charitable organization. An example of such projects is Bang Pu in Samut Prakan, whose facilities resemble typical condominiums, with 300 multiperson residential units (Situation of the Thai Elderly report, 2015).

2.1.5 Price decomposition of housing

According to the markets concept, an entrepreneur’s target is to determine the consumer’s need and want to meet more effectively and efficiently than the competitors (Samut et al., 2023). Typically, the price is derived from the consumer’s need and the entrepreneur’s target. The entrepreneurs set up the price according to the several factors. This is the same concept in the housing market as well. Some studies examined the factors influencing housing prices and conducted housing economic valuation using the HPM. By contrast, several studies employed other methods such as quantile regression (Özsoy and Şahin, 2022; Mora-Garcia et al., 2019) or the classification and regression tree approach (Özsoy and Şahin, 2009). Theoretically, the HPM consists of three attributes that can affect housing prices: structural characteristics, social and natural environmental characteristics, and locational characteristics (Bowen et al., 2001).

Structural characteristics (i.e., age of the housing, existence of a central heating unit, number of rooms, type of room, number of floors, total floor area, land size, living area, owner’s business, facilities, safety systems, and so on) were found to be statistically significant (Owusu et al., 2019; Özsoy and Şahin, 2009; Kaluntakasuwan, 2017; Eag-ark et al., 2006; Bunjam and Nilbai, 2015). However, in some studies, the age of the housing and existence of central heating and parking were insignificant (Özsoy and Şahin, 2022). The structural characteristics of housing can affect prices. For instance, the prices of large-scale projects are lower than those of small-scale projects owing to the economy of scale (Eag-ark et al., 2006). Social and natural environmental characteristics (i.e., views, rivers, seas, natural community surroundings, nature of the land, inclusion in an industrial promotional zone, and so on) were also determined to be statistically significant (Nutsarabut, 2017; Wutthicharoenkit, 2018; Aziz et al., 2021). Locational characteristics (i.e., floor level, distance from a hospital/school/park/central business district (CBD) proximity to the road, and so on) were also found to be statistically significant. Location is also a crucial factor that can determine housing prices (Czinkan et al., 2019; Owusu et al., 2019). For example, municipalities have higher prices than other areas, because they expect to have a large population in the future (Czinkan et al., 2019).

In addition, in terms of the psychological aspect, the regional characteristic of the inflow area are also important factors. Cities with higher-administrative levels, larger populations, sufficient medical resources, etc., are more attractive to migrants. However, in terms of culture aspect, elderly care in their hometowns also tend to reside in cities (Xu et al., 2023).

In terms of operators (sellers), their pricing behavior was examined to explain housing sale prices using the HPM and its spatial extensions (Ozhegov et al., 2021).

Moreover, sellers have become prone to inferring asking prices based on prior housing sales within the vicinity (Lo et al., 2021).

Table 1. Type of elderly housing based on elderly type and level of care

No.	Housing Type	Description	Type of Elderly	Level of Care
1	Residential home	ADL assistance Nonregular nursing care Accommodation and food Services	Self-reliant Living alone	Low
2	Assisted living	Daily task assistance Non-regular nursing care Accommodation and food Services	With physical limitations With a disability	Moderate
3	Nursing home	Long-term care 24-hour nursing care ADL and mobility assistance Individual care Rehabilitation Accommodation and food Services	With chronic illness With a disability Suffering from mental deterioration With cognitive impairment	High
4	Long-term care hospital	Hospitalization Medical team and nursing services	Recovering after surgery	Highest
5	Hospice care	Medical team and nursing services Spiritual care Alternative care	Cancer patient With dementia	Highest

Source: Department of Business Development, Ministry of Commerce, 2021

Moreover, there are many external factors influencing housing prices such as the competitors in the market, government regulation, economic condition, building material cost, etc., (Rahadi et al., 2018). In terms of the competitors in the market, they still have affected the price of the same enterprise. The high competition among the companies in the market that provide the same product and services is going to be high. Thus, intensive competition in the industry makes a limited space to make the higher profitability (Riswanto & Wickasono, 2021).

2.2 Theoretical framework

This study intends to investigate the determinants of elderly housing prices using the HPM to show the economic valuation of elderly housing.

Theoretically, the HPM consists of three attributes that can affect housing prices, that is, structural characteristics, locational characteristics, and social and natural environmental characteristics (Bowen et al., 2001). This study identifies structural characteristics and locational characteristics as the two attributes affecting elderly

housing prices and excludes social and natural environmental characteristics from the model, because most elderly housing entrepreneurs are not concerned about environmental factors when choosing the location of their business and focus instead on structural factors. In addition, current data on such attributes are unavailable. Therefore, given the appropriately measured variables in the two categories, the proper specification of the hedonic price function is as follows:

$$P = f(S, L). \quad (1)$$

Equation (1) represents the hedonic pricing function, which determines price based on structural characteristics and locational characteristics. The hedonic pricing regression model is typically used to empirically estimate the prices of such attributes, as follows:

$$P_i = \beta_1 + \beta_S X_{Si} + \beta_L X_{Li} + \varepsilon_i, \quad (2)$$

where P represents the observed cross-sectional sales prices of housing units on the market, X_{Si} is the vector of the structural attributes, X_{Li} is the vector of the locational attributes, and ε_i represents the stochastic disturbance term (error term) from classical regression theory. In addition, β_S and β_L are the coefficients for estimating the corresponding implicit marginal prices.

3. DATA AND METHODOLOGY

3.1 Data collection

The primary and secondary data are obtained from 114 elderly housing projects located in the BMR. The collective data are divided into two groups: (1) primary data obtained from the questionnaires via phone interviews, email, field visits, and face-to-face in-depth interviews and (2) secondary data obtained from elderly housing project websites and social media, including those of related organizations in Thailand.

According to Table 2, more than half of elderly housing projects are in Bangkok, with the rest located within the vicinity. Nearly all of the projects are from the private sector, and more than half are nursing homes.

Table 2. Summary of elderly care and housing in BMR according to business type

Variable	Location		
	Bangkok	Vicinity	Total
Type of business			
Nursing home	22 55.00%	18 45.00%	40 100%
Residential home and other	46 62.16%	28 37.84%	74 100%
Total	68 59.65%	46 40.35%	114 100%

Note: Residential home and other consist of residential home, assisted living, long-term care hospital, and hospice.

3.2 Data analysis

HPM

The HPM is a prevalent method for examining and learning about how the prices of certain goods are determined by the aggregated value of a set of attributes or characteristics. Multiple regression analysis is the primary statistical method used in the empirical HPM, and previous econometric studies on the determinants of housing prices divided value-contributing factors into different major categories by accessing numerous free-market housing transactions, in which the transaction price reflects the market value determined through a bundle of characteristics (Song et al., 2019).

Hedonic equations as one-way housing expenditures can be decomposed into measurable prices and quantities to predict and compare rent for different dwellings or identical dwellings in different areas. At its simplest, a hedonic equation is a regression of expenditures (rent or value) on housing characteristics. The independent variables represent the individual characteristics of a dwelling, and the regression coefficients may be transferred to the estimates of the implicit prices of such characteristics (Malpezzi, 2003).

This study employs the HPM to analyze elderly housing prices, as follows:

$$P_{ij} = \beta_0 + \beta_1 X_{1ij} + \beta_2 X_{2ij} + \beta_3 X_{3ij} + \dots + \beta_k X_{kij} + \varepsilon_{ij}, \quad (3)$$

where P_{ij} is the price of the i th elderly housing according to the type of room, β_i is the coefficient of the independent variable, ε_{ij} is the disturbance term (error term), and X_{kij} is the independent variable k th factors ($k = 1$ to 9) according to the i th elderly housing and j th type of room ($j = 1$ to 4).

In addition, linear and log-linear models are used to analyze the factors influencing elderly housing prices according to the HPM.

$$\ln P_{ij} = \beta_0 + \beta_1 X_{1ij} + \beta_2 X_{2ij} + \beta_3 X_{3ij} + \dots + \beta_k X_{kij} + \varepsilon_{ij}, \quad (4)$$

where $\ln P_{ij}$ is the natural log of the price of the i th elderly housing according to the type of room. The details of each variable are presented in Table 4.

In Table 3, the two attributes (structural and locational characteristics) are categorized into five groups, including (1) type of contract, (2) type of room, (3) type of operator, (4) type of service, and (5) location. In this study, such factors are assumed to affect elderly housing prices. In addition, three models consisting of linear and log-linear HPMs are estimated according to the different factors to analyze the estimation of elderly housing prices.

“Linear model” refers to the linear HPM, in which price is the dependent variable. The independent variable consists of ownership, period, type of room, level of room, type of operator, branch, type of business, location, population density, and distance to the CBD.

“Log-linear model 1” refers to the log-linear HPM. The natural log of price is the dependent variable, and the independent variable is the same as that in the “linear model.”

“Log-linear model 2” refers to the log-linear HPM. The natural log of price is the dependent variable, and the independent variable is the same as that in the “linear model” and “log-linear model 1,” except for the population density and distance to the CBD variables.

Table 3. Description of variables in HPM according to related attributes

No.	Variable Group	Variable	Description
1	Type of contract	Type of ownership	1 = tenant, 0 = owner
		Period	1 = daily care, 0 = monthly and long-term care

2	Type of room	Type of room	1 = single, 2 = double, 3 = share, 4 = private house
3	Type of operator	Type of operator	1 = private, 2 = government, 3 = private-government, 4 = NGO/charity organization
		Branch	1 = more than 1 branch, 0 = no branch
4	Type of service	Type of business	1 = residential home, 2 = assisted living, 3 = nursing home, 4 = long-term care hospital, 5 = hospice care, 6 = all of above
5	Location	Location	1 = Bangkok, 0 = Vicinity
		Population density	1 = in the municipality, 0 = outside the municipality
		CBD	Km.

Source: Categorized by the authors.

4. RESULTS

The results can explain the descriptive statistics of the attributes (structural and locational characteristics), which are categorized in Table 4. The table also presents the results of the dependent and independent variables in the HPM. The price of elderly housing is approximately THB 30,700 (around USD 930; USD 1 = THB 33). The average price of a private house (monthly) is higher than that of the different types of rooms, among which a single room has the highest price, followed by a double room and shared room. The price of a private house is about 2.5 times higher than that of a shared room.

In Table 5, the estimated results of the three models reveal that a log-linear model is more suitable than a linear model, specifically, log-linear models 1 and 2 are more appropriate than the linear model. In the linear model, the main issue is the value of the dependent variable (price), which is different from the value of the independent variable (dummy variable), causing the base price to have a negative value. In addition, log-linear model 2 is more suitable than log-linear model 1, because two correlated variables (i.e., population density and distance to the CBD) are dropped from this model. Therefore, log-linear model 2 is the most appropriate model for this study.

According to Table 6, the details of the determinants of elderly housing prices can be explained based on the group of each attribute.

1. The base price of elderly housing is USD 145.24 per month. Further expenses are based on the type of contract, type of service, and type of room. For instance, assuming that most of the elderly residents are tenants, they will pay a price higher than the base price, that is, USD 225.78 per month. The base price is used, which combines ownership types (tenants vs. owners), to explain the results. Thus, the base price is USD 371.02 per month.

2. In terms of the structural characteristics, several findings are revealed.

2.1 The elderly tenants must pay a higher price than the homeowners of USD 225.78 per month. Moreover, daily care is more expensive than monthly care, at USD 414.53 per month, which is a percentage change of 111.73% from the base price.

2.2 The elderly must pay a nursing service price of USD 218.40 per month, which is a percentage change of 58.86% from the base price.

2.3 The price of government-operated elderly housing is lower than that of elderly housing managed by other types of operators. The price of government-subsidized

elderly housing is USD 85.22 per month, which is a percentage change of -22.97% from the base price. In addition, if the elderly housing has a branch in more than one location, then the price will decrease to USD 23.80 per month, which is a percentage change of -6.41% from the base price.

2.4 The price of a single room is higher than that of a shared room, at USD 54.31 per month, which is a percentage change of 14.64% from the base price.

2.5 With regard to the locational characteristics, the findings reveal that the elderly housing price within the vicinity is lower than that in Bangkok, at USD 43.47 per month, which is a percentage change of -11.72% from the base price.

Table 4. Bivariate analysis of prices categorized according to each attribute

Variable	Observation	Average Price (per month)	
		THB	THB 33 = 1 USD
Dependent Variable (Price)	219	30,700	930
Type of room			
- Shared room	107	22,938	695
- Double room	38	33,776	1,024
- Single room	61	38,236	1,159
- Private house	13	50,231	1,522
Type of contract			
Type of ownership			
- Tenant	218	30,786	933
- Owner	1	12,000	364
Period			
- Daily	4	58,875	1,784
- Long-term care	215	30,176	914
Type of operator			
Type of operator			
- Private	205	30,875	936
- Non-private	14	28,143	853
Branch			
- Branch	78	27,449	832
- Non-branch	141	32,499	985
Type of business			
- Nursing home	86	29,852	905
- Residential home and other services	133	31,248	947
Location			
Location			
- Bangkok Metropolis	142	34,904	1,058
- Vicinity	77	22,948	695

Population Density			
- Municipality	206	31,106	943
- Non-municipality	13	24,269	735

Source: Calculated by the authors.

Table 5. Determinants of elderly housing price according to each model

Variable	Linear Model	Log-linear Model 1	Log-linear Model 2
Constant (Base Price)	-2,398.73	8.4863 ***	8.4749 ***
<u>Type of contract</u>			
Tenant vs Owner	22,088.85	0.9256 **	0.9379 **
Daily care	27,777.52 **	1.2249 ***	1.3491 ***
<u>Type of room</u>			
Single Room	10,094.25 ***	0.3116 ***	0.3177 ***
<u>Type of operator</u>			
Government	-9,465.47	-0.8565 ***	-0.8837 ***
Branch	-5,779.85 **	-0.1765 ***	-0.1789 ***
<u>Type of service</u>			
Nursing services	16,388.13 **	0.9812 ***	0.9178 ***
<u>Location</u>			
Location	-11,865.44 ***	-0.3502 ***	-0.3557 ***
Population density	2,074.01	0.0392	
Distance to CBD	-752.48 **	-0.0211 **	
<hr/>			
N	219	219	219
RSS	5.03E+10	39.5991	40.3853
F-test	9.0899	16.0727	19.8697
R-squared	0.2813	0.4090	0.3973
Adjusted R-squared	0.2504	0.3836	0.3773

Note: *significant at 0.1, **significant at 0.05, ***significant at 0.01

Table 6. Estimated results of Log-linear HPM

Variable	Log-linear Model (2)	Unit Price	
		THB 33 = USD 1	% Change from Base Price
Constant (Base Price)	8.4749 ***	145.24	
<u>Type of contract</u>			
Tenant vs Owner	0.9379 **	225.78	100.00%
Daily care	1.3491 ***	414.53	111.73%
<u>Type of room</u>			
Single Room	0.3177 ***	54.31	14.64%
<u>Type of operator</u>			
Government	-0.8837 ***	-85.22	-22.97%
Branch	-0.1789 ***	-23.80	-6.41%
<u>Type of service</u>			
Nursing services	0.9178 ***	218.40	58.86%
<u>Location</u>			
Location	-0.3557 ***	-43.47	-11.72%
N	219		
RSS	40.3853		
F-test	19.8697		
R-squared	0.3973		
Adjusted R-squared	0.3773		

Note: *significant at 0.1, **significant at 0.05, ***significant at 0.01

5. CONCLUSION

This study categorizes the factors affecting the prices of elderly housing located in Bangkok and within the vicinity by dividing them into two attributes (structural and locational attributes) and employing the HPM. According to the results, each issue can be explained.

The log-linear models are employed more than the linear model to estimate the unit price of the elderly housing, because the magnitude of the price is higher than that of the independent variable. Thus, in this study, the log-linear model is suitable for analyzing elderly housing unit prices.

Structural attributes have a stronger impact on prices than locational attributes, and the estimated prices are determined by three groups of variables (type of contract, type of operator, and type of service). Furthermore, type of contract, based on ownership type and period, is the most crucial factor influencing price changes in elderly housing.

In terms of nursing services, a high price is paid for the business type, which refers to the health status of older people and the level of care.

Elderly housing with more than one branch will have lower prices than those with only one branch, because the former may increase the economy of scale, and operators can reduce the cost of running their business. Thus, large businesses have more advantages than small businesses.

6. DISCUSSION

Typically, locational attributes are the most crucial factors affecting housing prices; however, they do not have the same impact on the prices of elderly housing. The results show that location is not the main factor affecting the prices of elderly housing. Nursing services, rather than locational attributes, are the main factors affecting elderly housing prices. This finding implies that the elderly require nursing services and assistance when they are no longer able to do things by themselves near the end of their life. They may not need to move to the city for housing, because they are satisfied with their current housing near their family and hometown.

Although the results reveal that room type has a stronger effect on prices than the other factors, room type (especially a private house) refers to luxury rooms with facilities that may not be necessary for the elderly. Thus, luxury rooms do not reflect accurate prices. By contrast, this study is concerned about future government subsidies and nursing services, because the results show the government's inadequate subsidy for the elderly and the elderly's increasing expenditures owing to nursing services.

The quantitative analysis reveals that the two attributes (structural and locational attributes) can determine elderly housing prices based on the constructed HPM. In addition, health status can determine prices owing to the various types of equipment required to treat the elderly in routine check-ups as well as the additional services necessary to cure the elderly of their illnesses.

The policy implication of this study is that governments should encourage people to take better care of their health. Suppose people are in poor health or unable to support themselves at the end of life. In that case, they will pay more for their caregivers according to their health level because the study found that the elderly housing facilities with the highest level of care for their clients. If the elderly cannot help themselves or are bedridden, such services will charge higher care fees. On the other hand, if the elderly can help themselves, they would have fewer self-care costs. In addition, Governments should also promote more outstanding preparation for end-of-life expenses. Because if the elderly have good financial planning after retirement. It will allow those who want to use the service to have more options for using the convenient service.

7. RECOMMENDATIONS

Data on social and natural environmental attributes (i.e., pollution, crime- and disaster-prone areas, and so on), which are among the three attributes in the HPM, could not be obtained for this study. As such information is unavailable, the data for the analysis are insufficient. Most Thai entrepreneurs may not be concerned about such attributes, unlike those in other countries, and may focus instead on structural attributes. Therefore, future studies should consider social and natural environmental attributes in analyzing the determinants of elderly housing prices.

Appendix

Survey questionnaire on elderly housing in the BMR

1. What is the ownership type of your business?
2. What type of business do you operate?
3. How old is your business (years/months)?
4. What are the characteristics of elderly housing?
5. What is the duration of your service?
6. How many branches does your business have?
7. What is the right to stay of the elderly?
8. What types of rooms are available in your housing facility?
9. What is the level of your rooms?
10. What elderly types use your services?
11. Have you ever received a service award?
12. Please specify the security equipment and systems in your elderly housing.
13. Please specify the elderly assistance equipment and room amenities in your housing facility.
14. Please specify the equipment and facilities in your elderly housing.
15. Do you charge a booking fee?
16. Do you charge an entrance fee?
17. Do you require an advance deposit?
18. Please specify the environment and landscape surrounding your elderly housing.
19. Please specify your elderly housing and living environment.
20. Is the location of your establishment within a municipal or non-municipal area?
21. Please specify the distance of the elderly housing to essential places.

ACKNOWLEDGMENTS

The authors are grateful to the anonymous representatives of the elderly housing projects for the information they provided, which supports the quantitative analysis of this study. This study has been approved by the Human Research Ethics Committee of Thammasat University of Social Sciences (Certificate of Approval No.: 067/2565; date of approval: November 1, 2022). The authors also thank the anonymous reviewers for the helpful comments.

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