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Determinants Influencing the Price of Second-Hand Condominiums in Bangkok's Central Business District, Thailand

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Abstract:

This study aims to analyze the factors affecting the prices of second-hand condominiums in Bangkok's central business district (CBD). After the COVID pandemic, new residential properties in urban areas of Bangkok have become more complicated to sell because of declining purchasing power among customers, with many new buyers turning to second-hand properties. In 2023, the sales growth of second-hand houses and condominiums in Bangkok increased by up to 2.6 trillion baht compared to 2022. Notably, second-hand condominium sales in Bangkok grew by approximately 36.7%. Additionally, the younger generations prefer to live in urban areas near public transport and their workplaces. In this study, 400 second-hand condominiums in Bangkok's CBD opened between 2018 and 2023 were surveyed, and data were collected. Twenty-four independent variables related to pricing factors, including locational and structural attributes and neighborhood environments, were examined. The hedonic price model investigated the factors influencing second-hand condominium prices. This study aims to highlight the importance of various physical attributes that affect the prices of second-hand

Keywords:

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residential properties and identify areas where the prices of second-hand condominiums have grown the most. The key outcomes of this research can guide public decision-making and provide insights for businesses involved in second-hand residential properties or related sectors. The results indicate that factors such as distance to urban rail transit stations, proximity to the nearest expressway, floor location, number of bedrooms, room size, availability of common areas, presence of furniture, parking facilities, EV chargers, and proximity to shopping centers and temples all influence the prices of second-hand condominiums in Bangkok's CBD.

影響泰國曼谷中央商務區二手公寓價格的決定因素

摘要：

本研究旨在分析影響曼谷中央商務區二手公寓價格的因素。新冠疫情大流行後，由於客戶購買力下降，曼谷市區的新住宅出售變得更加複雜，許多新買家轉向二手房。2023年，曼谷二手房和公寓的銷售額較2022年增長高達2.6兆泰銖。此外，年輕一代更喜歡居住在靠近公共交通和工作場所的城市地區。本研究對曼谷中央商務區2018年至2023年間開業的400套二手公寓進行了調查，並收集了數據。研究了與定價因素相關的二十四個自變量，包括位置和結構屬性以及鄰裡環境。特徵價格模型研究了影響二手公寓價格的因素。本研究旨在強調影響二手住宅價格的各種物理屬性的重要性，並確定二手公寓價格增長最快的地區。這項研究的主要成果可以指導公共決策，並為二手住宅或相關行業的企業提供見解。結果表明，影響因素包括距離城市軌道交通車站的距離、距離最近高速公路的距離、樓層位置、臥室數量、房間大小、公共區域的可用性、家具、停車設施、電動汽車充電器以及與購物中心的距離等。

关键词：二手公寓，住宅价格，中央商务区，享乐价格模型，曼谷

1. Introduction

Due to the COVID-19 pandemic since 2020, many Thai people have faced financial problems and housing loan burdens, compounded by the impact of household debt. In 2023, there was an increase in the sale of second-hand residential properties owing to the country's struggling economy. The higher interest rates made it costlier for investors who bought real estate for rental purposes. Meanwhile, the rental market was not doing well because people lacked purchasing power, and there was an unclear government policy to stimulate the economy. This resulted in a sluggish rental market and an increase in the sale of residential properties in the overall market, reaching 900 billion baht. Consequently, there has been a rise in non-performing loans (NPL) and non-performing assets (NPA) that do not generate income (Real Estate Information Center, 2023a).

The market situation for second-hand houses and condominiums has seen a significant increase in combined sales, up to 2.6 trillion baht, compared to 2022. This reflects the decrease in purchasing power. In 2023, there was a high demand for second-hand condominiums, accounting for 36.7% of the Jatujak-Bangkapi-Huai Khwang area. For single houses, the most searched area was the Sai Mai-Klong Sam Wa-Bang Khun Thian. In the third quarter, there was a 40-

60% increase in listings for inner-city properties in Bangkok, mainly condominiums, indicating more supply than demand. The average listing price for a one-bedroom condo increased by 3.4%, whereas the cost for a two-bedroom condo slightly decreased by 0.3%. High-rise condo prices increased for one- and two-bedroom units by 1.8% and 0.9%, respectively (Bangkokbiznews, 2023).

During the first quarter of 2023, Thailand's second-hand residential market expanded by 2.7% compared to the same period in 2022. The houses with the most listings were single houses, townhouses, and condominium units. Sales prices for second-hand residences expanded significantly within a price range of up to 3 million baht. Moreover, most sellers and buyers are in Bangkok. In the second quarter of 2023, the second-hand residential market in Thailand saw a 15.8% decrease in listings compared with the same period in 2022. The houses with the most listings were single houses, condominium units, and townhouses. All types of residential property experienced a decrease in listings, except for condominium units and commercial buildings. Among these, condominium units had the highest decrease in listings, at 7.6% in units and 29.8% in value. This was due to the continuous absorption of second-hand house inventory, even though the transfer of ownership of condominium units increased. The

influx of new condominium units into the market has also contributed to this increase in supply (Real Estate Information Center, 2023b).

When considering the sales prices for second-hand residential properties in the second quarter of 2023, it was found that the residential properties with the highest listings were single houses, condominiums, and townhouses. When comparing the number of units of each type at the end of the second quarter of 2023 with the previous quarter, it was found that expansion in the condominium market for second-hand properties increased the most. Despite an increase in the transfer of ownership of condominium units from the first quarter, condominiums expanded by 7.6%. Subsequently, commercial buildings increased by 5.1%, semi-detached houses decreased by 26.6%, detached houses decreased by 20.6%, and townhouses decreased by 12.4% (Real Estate Information Center, 2023c).

When considering the provinces with the highest number of residential properties for sale in the top 10 rankings at the end of the second quarter of 2023, they are Bangkok, Nonthaburi, Phuket, Samut Prakan, Chonburi, Chiang Mai, Pathum Thani, Prachuap Khiri Khan, Surat Thani, and Nakhon Ratchasima. Among these, Bangkok had the highest number of units for sale, with 52,175 units, accounting for 36.7% of the total, valued at 558,545 million baht. Comparing this to the first quarter of 2023 and the same period in 2022, Bangkok saw an increase in the number of units and total value of properties listed for sale, indicating a growing second-hand residential property market in the city (Real Estate Information Center, 2023c).

Based on these data, there are opportunities to understand the pricing strategies for residential properties and investment decisions. Researchers are interested in studying the physical characteristics that influence the pricing of second-hand condominiums in the central business district (CBD) area because Bangkok has the highest number of property listings, especially in the condominium segment, which has seen significant expansion. This study aims to highlight the importance of various physical attributes that affect the prices of second-hand residential properties and identify areas where the prices of second-hand condominiums have grown the most. This information can guide public decision-making and provide insights for businesses involved in second-hand residential properties or related sectors.

2. Literature Review

2.1. Concept of Hedonic Pricing Model

The hedonic pricing model is used to study the relationship between the price of consumer goods and the characteristics of those goods. It is widely used in research, particularly in real estate economics (Zhang & Xiang, 2021).

The hedonic pricing method is commonly used to

study the value of environmental characteristics as an attribute. This method has been widely applied in real-estate market studies. Economists use this method to estimate the implicit price of combined quality attributes. It is often used to analyze various components of residential properties. For example, the number of rooms, building age, room size, distance, and surrounding environment. Therefore, the estimation of property values using the hedonic price model is commonly used to study the characteristics that influence the price of second-hand condominiums in the CBD of Bangkok. A case study of newly opened condominiums between the years 2018-2023 was conducted to understand the relationship between the price of second-hand condominiums and their various physical characteristics. The application of the hedonic pricing method to the hedonic price model involves creating a hedonic price function that can explain how the price of second-hand condominiums (P) is determined by various factors. For example, in this study, the price of second-hand condominiums was determined by three groups of variables.

$$P = f(L, S, N)$$

where

P is the price of second-hand condominiums in the CBD;

L is the location attribute;

S is the structure attribute of the project;

N is the neighborhood environmental attribute.

The characteristics of location will consider the distance from the various amenities surrounding the condominium being studied. These amenities include train stations, shopping centers, hospitals, educational institutions, and proximity of the condominium to the main roads. As for the project structure characteristics, they will focus on various physical aspects of the condominium, such as the building's age, the floor level of the property, the presence of lifts in the project, the number of units, floors, bedrooms, bathrooms, project area, room area, common area, furniture, and the reputation and reliability of renowned developers. The final characteristic is the nearby environmental features, which will consider what significant facilities or amenities exist in the vicinity of the condominium, such as shopping centers, public parks, educational institutions, and hospitals.

2.2. The Concept of Multiple Linear Regression Analysis

Multiple linear regression (MLR) is a statistical method used to analyze the relationship between multiple independent variables ($X_1, X_2, \dots, X_p$) and one dependent variable (Y). The MLR model can be represented by equations (1), (2), and (3).

Population regression equation is as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_p X_p + \varepsilon \quad (1)$$

Regression equation of sample group is as follows:

$$\hat{y} = b_0 + b_1 X_1 + b_2 X_2 + \dots + b_p X_p \quad (2)$$

Regression equation of sample group in standard score format is as follows:

$$Z'_y = B_1Z_{x1} + B_2Z_{x2} + \dots + B_nZ_{xn} \quad (3)$$

The coefficients in a multiple linear regression model ideally fall between -1 and 1. If a coefficient exceeds this range, it indicates a negative or inverse relationship between variables. To test the accuracy of the model and determine if there were significant differences between the means of the data sets, statistical techniques such as t-tests were applied. These statistical procedures help evaluate the precision and the reliability of the model by assessing the significance of the coefficients and overall model fit (Tochaiwat et al., 2020).

In the case of qualitative variables, where X takes on two values, 0 when the variable does not possess the characteristic X and 1 when the variable does possess the characteristic X, a positive value of β in the equation means that the variable with the characteristic contributes to an increase in β Baht in the price of second-hand condominiums. Conversely, a negative value of β indicates that the variable with the characteristic contributes to a decrease in β Baht in the price of second-hand condominium.

2.3. Previous Research Related to Factors Affecting the Price of Condominium

There are some previous papers associated with finding the factors affecting the prices of condominiums and second-hand condominiums in Bangkok. Promniyom (2018) stated that there are three main factors influencing condominium prices in Bangkok: 1) locational characteristics, 2) structural features, and 3) neighborhood environment attributes. However, there are many aspects of each main factor, such as developer credibility, parking space availability, project area, public parks, and common area fees.

Suwanpakdee (2019) studied the condominium characteristics affecting the prices of second-hand condominiums in Bangkok and he investigated that there are 5 positive variables with statistical significance at $p < 0.05$: proximity to the BTS Skytrain, proximity to connecting stations, number of bedrooms, room size and room with furniture decoration. However, he also found that there are two negative impact variables on prices: building age and the number of rooms in the condominium. Pongpinyopap (2021) mentions that when real estate grows alongside urban expansion, it leads to differences in condominium prices with components such as location in the CBD area, location in the Node Pathumwan area, construction in the Sukhumvit zone, and building factors such as square footage, number of rooms, and reputation. Pongprasert (2022) studied the determinants of luxury condominium prices in Bangkok's CBD and found that there are six key attributes: the number of

units, percentage of car parking space/unit, location of private recreation park within the project area, rate of common area fee, location of building in street corner, and distance to expressway are interrelated to luxury condominium prices near urban rail transit stations in Bangkok's CBD.

As for structural factors, in general, it consists of six variables: the number of units, which indicates the level of density and congestion in the condominium; the number of floors in the condominium, where higher floors provide different panoramic views; the total project area, with more allocation and distribution of space indicating a more proportionate distribution; common area space; the reputation of the owner registered in the stock market, which reflects a higher level of credibility; and environmental impact assessment (EIA) results, which create confidence and reduce risks for buyers. Chairat (2022) investigated the number of floors in a building, the number of units for sale, and the proportion of parking spaces as the factors influencing the selling price of condominiums in Bangkok. DDproperty (2023) studied the condominium valuation and found that the price increases with the height of the condominium, and factors such as studio room type, room condition, city view, garden view, interior decoration, building condition, and market prices were used for comparison to estimate the value close to reality.

Regarding neighborhood environment factors, Promniyom (2018) also suggested that there are four influential factors to condominium prices: proximity to supermarkets or shopping malls within a 1 km-radius to provide convenience for condominium residents, proximity to schools or universities (educational institutes), proximity to public parks to enhance the greenery and scenic views, which contributes to increasing the value of the condominium, and common area costs, which indicate the level of the condominium.

Khumpaisal (2021) found that a good location and amenities in the condominium project would increase the price. The surrounding environment of buildings, such as locations near markets, police stations, schools, healthcare centers, and hospitals, affects the price of condominiums. This ensures quick access to assistance during emergencies and accidents.

According to the literature review, researchers conclude that the research framework consists of three independent variable groups:

- 1) locational attributes,
- 2) structural attributes,
- 3) neighborhood environment attributes.

The dependent variable is the selling price of second-hand condominiums in Bangkok's CBD, as shown in Figure 1.

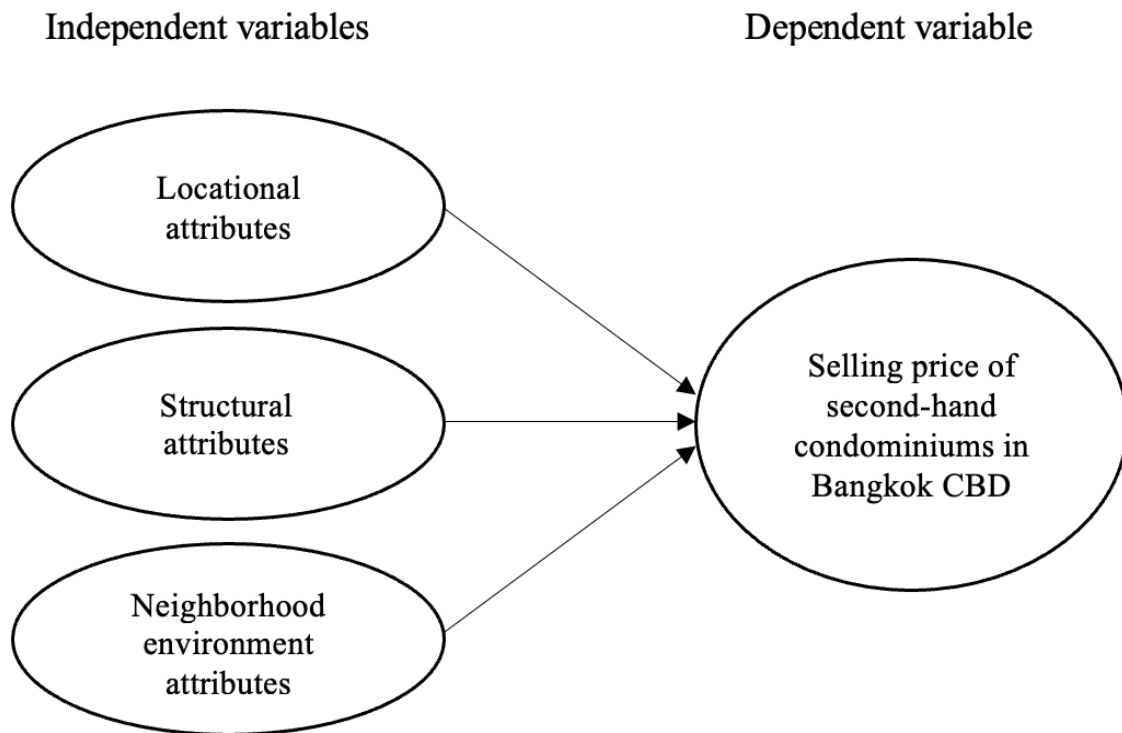


Figure 1. Research framework (Developed by the authors)

3. Research Methodology

The current study aims to investigate the factors influencing the prices of second-hand condominiums that are less than five years old (newly opened in 2018-2023) and located in Bangkok's CBD. After summarizing the literature review to define the set of variables for this research, data related to the variables from the sample were collected. It was carried out through on-site surveys at the project and by gathering data on samples of second-hand condominium units in Bangkok posted for sale on real estate websites, namely DDproperty Thailand (www.ddproperty.com), LivingInsider (www.livinginsider.com), ZmyHome (www.zmyhome.com), Bestlivingcondo (www.bestlivingcondo.com), Hipflat (www.hipflat.co.th), Prakard (www.prakards.com), BaanFinder (www.baanfinder.com) and Thaihometown (www.thaihometown.com).

The data relevant to the variables were collected from the samples and divided into four parts: 1) location characteristics, 2) structural characteristics, 3) neighborhood environment characteristics, and 4) current selling price of second-hand condominiums posted on real estate websites (Table 1).

Some data related to the distance and proximity between second-hand condominiums and surrounding buildings near the project were measured in the shortest route using Google Maps. After data surveying, 400 second-hand condominium units in 46 projects were screened and selected as the research sample. This number of samples is sufficient (> 385 samples) compared to the minimum requirement number of samples recommended by Cochran (1953). He

estimated the proportion of the population when the size was large or unknown. This formula was used to analyze the sample size to estimate proportions and determine the size of the problem.

$$n = \frac{Z^2 P(1 - P)}{d^2}$$

where

n is the sample size (sample size);

Z is the selected Z-score (in this case, it is the Z-score for the 95% confidence level or 1.96);

P is the expected proportion of the population (in this case, 50% or 0.5);

d is the margin of error 0.05.

$$n = \frac{1.96^2 \times 0.5 \times (1 - 0.5)}{0.05^2}$$

$$n = \frac{0.9604}{0.0025} = 384.16 \approx 385 \text{ samples}$$

In the data analysis method, this research uses SPSS (Statistical Package for Social Science) for Windows version 17th to find the statistical results of Multiple Regression Analysis (MRA). The equation for the MRA model is as follows:

$$P = \beta_0 + \beta_{L1}L1 + \beta_{L2}L2 + \beta_{L3}L3 + \beta_{L4}L4 + \beta_{L5}L5 + \beta_{S1}S1 + \beta_{S2}S2 + \beta_{S3}S3 + \beta_{S4}S4 + \beta_{S5}S5 + \beta_{S6}S6 + \beta_{S7}S7 + \beta_{S8}S8 + \beta_{S9}S9 + \beta_{S10}S10 + \beta_{S11}S11 + \beta_{S12}S12 + \beta_{S13}S13 + \beta_{S14}S14 + \beta_{N1}N1 + \beta_{N2}N2 + \beta_{N3}N3 + \beta_{N4}N4 + \beta_{N5}N5$$

Additionally, the variance inflation factor (VIF) was checked for excessive correlation among the variables. If the VIF value is no more than the acceptable value of 10, the independent variables are not highly correlated with each other.

Table 1. Determinants of second-hand condominium unit price (Developed by the authors)

Variable group	Variables	Var.	Condition
Locational characteristics (L)	Distance from the nearest train station	L1	Distance (km)
	Property location	L2	0 = Non-core CBD 1 = Core CBD
	Distance from the nearest expressway	L3	Distance (km)
	Close to street corner	L4	0 = The project is not on the street corner 1 = The project next to the street corner
	Close to main road	L5	0 = The project is not on the main road 1 = The project is on main road
	Trustworthiness	S1	0 = Developer is not registered in the stock market. 1 = Developer is registered in the stock market.
	Building age	S2	Building age (years)
	Floor location	S3	Floor
	Number of elevators	S4	0 = Proportion greater than 1:100 units 1 = Proportion not more than 1:100 units
	Number of units	S5	Rooms
Structural characteristics (S)	Number of floors	S6	Floors
	Number of bedrooms	S7	Rooms
	Number of bathrooms	S8	Rooms
	Project area	S9	Sq.m.
	Room size	S10	Sq.m.
	Common area	S11	0 = None 1 = Having at least fitness room, swimming pool and co-working space in project.
	Furniture	S12	0 = Empty room 1 = Room with furniture
	Parking space	S13	0 = Less than 50% of numbers of room 1 = more than 50% of numbers of room
	EV charger	S14	0 = None 1 = Having EV charger in building
	Proximity to shopping center	N1	0 = More than 1 km 1 = Distance within 1 km
Neighborhood environment characteristics (N)	Proximity to public Park	N2	0 = More than 1 km. 1 = Distance within 1 km.
	Proximity to educational institute	N3	0 = More than 1 km. 1 = Distance within 1 km.
	Proximity to hospital	N4	0 = More than 1 km. 1 = Distance within 1 km.
	Proximity to temple	N5	0 = More than 1 km. 1 = Distance within 1 km.

4. Results

4.1. Descriptive Data

The summary of characteristics of 400 second-hand condominium units in 46 projects located in seven districts of Bangkok's CBD: Sathorn, Din Daeng, Ratchathewi, Pathumwan, Khlong Toei, Bang Rak, and Wattana. As for location characteristics, the average distance from condominiums to urban rail transit stations is 640 m, which is within the acceptable walking distance for people in Bangkok (Pongprasert & Kubota, 2018). Almost 51% of samples were located near the urban rail transit station within 500 m (50.50%). Of the sample, 28.50% are in the core CBD of Bangkok, such as Silom, Sathorn, and the area around Rama IV. It is defined as the business district area with the highest proportion of commercial activities. 97% of them are near expressways within 4 km. Of these, 96.50% were located near street corners. Most were not near the main road (59.50%). Regarding the structural attributes, most of them were developed by developers in stock exchanges in Thailand (76.00%).

Most of the sample was in buildings aged between 4-5 years old (82.60%). 72.25%. 36.75% were second-hand condominium units on floors 1-10, while 35.50% were on floors 11-20. A total of 54.30% of the sample was in the condominium project with a lower number of elevators (not more than one elevator: 100 units). A total of 77.75% were in projects with less than 500 condominium units. Of these, 52.50% were in projects with 20-40 floors. Most of them were condominiums with one bedroom (63.80%) and one bathroom (67.30%), and most of them (92.75%) were in a room area of less than 100 sq.m. Almost 90% of the projects had an area of 8,000 square metres or less. Most projects had similar amenities, with 81.25% having fitness centers, swimming pools, and co-working spaces. 85 per cent percent are sold furnished. Regarding parking convenience, 70.75% of the projects have parking spaces of at least 50% of the units, and most projects have EV chargers to accommodate the increasing number of electric vehicles (67.75%). As for neighborhood environment attributes, most samples are close to shopping centers, educational institutes, and hospitals within a 1 km radius from projects (93.25%,

87%, and 50.50%, respectively).

In terms of the selling price of the 400 samples, the minimum price is 4,314,000 baht, while the maximum price is 61,737,500 baht. The average price was 14,890,633.14 baht per unit or 297,812.66 bath per sq. m, which indicates that the average room area of the sample was 50 sq.m.

4.2. Multiple Regression Analysis

Hypothesis testing using multiple regression analysis was conducted using SPSS statistical software based on the analysis of 24 variables: distance from the nearest train station (L1), property location (L2), distance from the nearest expressway (L3), proximity to the street corner (L4), proximity to the main road (L5), trustworthiness of the operator (S1), building age (S2), property floor level (S3), number of passenger elevators (S4), number of units (S5), number of floors (S6), number of bedrooms (S7), number of bathrooms (S8), project area (S9), room area (S10), common area (S11), furniture (S12), parking space (S13), EV charge (S14), proximity to shopping centers (N1), large public parks (N2), educational institutions (N3), hospitals (N4), and temples (N5). These variables were analyzed to determine their impact on the prices of second-hand condominiums in the CBD of Bangkok using multiple regression analysis.

In the result of the multicollinearity test, we found that the highest VIF value was 6.486, which was below 10. Therefore, there is no significant multicollinearity, indicating that all the independent variables analyzed in

this study are not excessively correlated and are independent of each other (Hair et al., 2006). In other words, there is no complexity in measuring their values, allowing regression analysis to proceed without issues.

The results, as shown in Table 2, indicate that the model has an adjusted R-squared value of 0.885, meaning that it can explain 88.5% of the variability in the dependent variable. In addition, the significance value (Sig.) is less than 0.05, indicating that at least one independent variable, which is the price of second-hand condominiums in Bangkok's CBD, is significantly related to the dependent variable.

The results show that 11 factors significantly affect the prices of second-hand condominiums in Bangkok's CBD. Two significant factors from the location characteristics group, "Distance from the train station" and "Distance from the nearest expressway," were significant at $p < 0.01$. There were seven significant factors in the structural characteristics group. Among them, "Floor location," "Number of bedrooms," and "Room area" are significant at $p < 0.01$, while "Common area," "Furniture," "Parking space," "EV charger" are significant at $p < 0.05$. For the neighborhood environment characteristics group, "proximity to shopping centers" and temples were significant at $p < 0.05$.

Among these factors, two—"Distance to the train station," "Number of bedrooms"—have a negative impact on the price of second-hand condominiums in Bangkok's CBD. The factor with the greatest impact was "distance from the nearest train station."

Table 2. Results from regression model analysis (Developed by the authors)

Variables	Unstandardized coefficient		t	p-value
	B	Std. error		
Constant	-1.175E7	2994548.569	-3.923	.000**
L1: Distance to urban rail transit station	-6266676.286	1445301.306	-4.336	.000**
L2: Property location (0,1)	-359404.362	1037317.626	-.346	.729
L3: Distance to the nearest expressway	1009382.078	342541.308	2.947	.003**
L4: Close to the street corner (0,1)	1793930.207	1923181.594	.933	.352
L5: Close to the main road. (0,1)	1117674.447	966815.579	1.156	.248
S1: Trustworthiness (0,1)	1511050.490	996258.204	1.517	.130
S2: Building age	67249.873	239644.055	.281	.779
S3: Floor location	104041.217	34641.368	3.003	.003**
S4: Number of elevators (0,1)	839650.087	855655.801	.981	.327
S5: Number of units	2077.518	1646.030	1.262	.208
S6: Number of floors	-46355.915	47528.247	-.975	.330
S7: Number of bedrooms	-3887854.340	1102165.633	-3.527	.000**
S8: Number of bathrooms	-528411.379	1102508.184	-.479	.632
S9: Project area	-417.117	311.060	-1.341	.181
S10: Room size	443876.085	16659.639	26.644	.000**
S11: Common area (0,1)	2452919.616	983164.412	2.495	.013*
S12: Furniture (0,1)	1859026.566	805883.769	2.307	.022*
S13: Parking space (0,1)	3093968.203	1256074.359	2.463	.014*
S14: EV charger (0,1)	1862181.023	903570.288	2.061	.040*
N1: Proximity to shopping center (0,1)	3444988.081	1484411.363	2.321	.021*
N2: Proximity to public park (0,1)	1360888.570	1032510.676	1.318	.188
N3: Proximity to educational institute (0,1)	1444858.257	1058343.431	1.365	.173
N4: Proximity to hospital (0,1)	-1266024.274	695873.960	-1.819	.070
N5: Proximity to temple (0,1)	1713329.276	821844.682	2.085	.038*
F = 129.531, p < 0.0005, Adj. R ² = 0.892 R ² = 0.885				

Notes: * Significant at $p < 0.05$, ** Significant at $p < 0.01$

The regression equation shows the relationship as follows:

$$Y = \beta_0 + \beta_{L1}L1 + \beta_{L3}L3 + \beta_{S3}S3 + \beta_{S7}S7 + \beta_{S10}S10 + \beta_{S11}S11 + \beta_{S12}S12 + \beta_{S13}S13 + \beta_{S14}S14 + \beta_{N1}N1 + \beta_{N5}N5$$

An equation form used in this study is as follows:

$$Y = -11,750,000 - 6,266,676.286L1 + 1,009,382.078L3 + 104,041.217S3 - 3,887,854.340S7 + 443,876.085S10 + 2,452,919.616S11 + 1,859,026.566S12 + 3,093,968.203S13 + 1,862,181.023S14 + 3,444,988.081N1 + 1,713,329.276N5$$

5. Conclusion and Recommendations

This study applies a hedonic pricing model to examine the determinants of the selling price of second-hand condominiums opened between 2018 and 2023 in Bangkok's CBD where residential property prices have risen sharply. The individual can use the prediction model to determine the price of second-hand condominium units in Bangkok's CBD. For data collection, 400 second-hand condominium units were used as samples. Multiple linear regressions were used for the data analysis. The results show that there are 11 factors that statistically significantly affect the prices of second-hand condominium units in Bangkok's CBD, at $p < 0.05$. Two variables negatively affecting the selling price are the distance to the urban rail transit station and the number of bedrooms. Nine variables that positively affect the selling price included distance to the nearest expressway, floor location, room size, having a common area, having furniture in the room, providing parking space, having EV chargers, proximity to shopping centers, and proximity to temples. Other independent variables that are not statistically significant do not necessarily imply that they are not so big in future research. The results may be limited to the samples used in this study. As for comparison with previous studies, this study found the same findings as those of Promniyom (2018), Suwanpakdee (2019), and Khumpaisal (2021) regarding proximity to urban rail transit stations, number of bedrooms, room size and room with furniture decoration, and proximity to shopping malls. However, this research investigated the new factors of parking area provision, floor location, having a variety of facilities in common areas, and proximity to the temple, which affect the prices of second-hand condominiums in Bangkok's CBD.

To recommend, if the second-hand condominium units in Bangkok's CBD are farther from the urban rail transit station and have more bedrooms, the prices would be cheaper. Controversially, if the second-hand condominium units are near the expressway, on the higher floor of the condominium, have larger room size, having at least a fitness room, swimming pool, co-working space in the building, selling room with furniture, having a higher number of parking spaces and EV chargers in the building, and being in the building closer to the shopping mall and temple, the price would be higher. Buyers and sellers can understand the factors

influencing the higher selling price of second-hand condominiums. Tax policy planners can use these research findings to obtain a higher real estate tax with second-hand condominium owners who set too high a selling price. For housing affordability, the city government could build more common facilities in public areas, such as fitness centers, swimming pools, and co-working spaces in Bangkok's CBD. The price of second-hand condominium units would be cheaper, and more people in an urban city could afford the residence. If second-hand condominium prices are affordable, economic growth would be better because people (workforces) could live near their workplace and not pay higher daily travel costs.

Author Contributions

Conceptualization, P.P.; methodology, T.C.; software, T.C.; validation, P.P.; formal analysis, P.P.; investigation, T.C.; resources, P.P.; data curation, T.C.; writing—original draft preparation, all authors contributed equally; writing—review and editing, T.C.; visualization, T.C.; supervision, P.P.; project administration, P.P. All authors have read and agreed to the published version of the manuscript.

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The raw data supporting the conclusions of this article will be made available by the authors on request.

Conflicts of Interest

The authors declare no conflicts of interest.

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