

-RESEARCH ARTICLE-

## FACTORS AFFECTING PRICE OFFERS FOR NEW SINGLE HOUSES IN THAILAND'S EASTERN ECONOMIC CORRIDOR AREA

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### —Abstract—

Especially in a commercially-promoted region like Thailand's Eastern Economic Corridor, housing prices are crucial to a nation's economy (EEC). Although it is known that prices are sensitive to house characteristics, accessibility variables, and locational factors, no empirical study has examined whether the impacts of the three sets of factors on the prices of EEC-listed houses are statistically significant. Consequently, the present study seeks to fill this need. We collected the prices of 215 residences in Thailand's EEC region listed on a single real estate website using a Python script as our primary data collecting instrument. Additionally, seven housing characteristics, five accessibility variables, and one locational factor were taken into account during data collection. Using regression as our primary analysis method, we discovered that four variables from the three categories strongly explained the pricing. Other statistics indicate that the output of the analysis is of acceptable quality. In addition to advancing theoretical understanding of housing costs in Thailand's EEC region, our findings can help housing developers improve their pricing tactics.

**Keywords:** Price offers; Thailand; Eastern Economic Corridor; New houses; Affecting factors

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## 1. INTRODUCTION

Housing costs have a significant impact on the national economy. Despite being illiquid and leveraged, the value of the principal dwelling is the highest share of household wealth. The level of real estate prices is frequently indicative of a nation's success and can influence both the micro- and macro-level dynamics of the business cycle and international financial markets (Paramati et al., 2019). Particularly intriguing is the question of what influences house price offers. Previous research has established the groundwork for answering this question; the price of a given house is a consequence of numerous elements, such as house characteristics, geographic factors, economic indicators, and business-related constructions (Avanijaa, 2021; Bhor, 2020; Hussain et al., 2021). Good locations offer distinct advantages, such as proximity to the city center or a public park (Avanijaa, 2021).

Thailand's Eastern Economic Corridor (EEC) has attracted great attention due to the government's extraordinary efforts to stimulate the country's economy. Initiated by the Thai government, the EEC has a surface area of around 13,000 km<sup>2</sup> and a population of 4.1 million as of 2020. (Emparanza et al., 2020). Near Bangkok, EEC encompasses three major provinces in Thailand's eastern region. Chachoengsao, Chon-Buri, and Rayong make up the three provinces. Figure 1 depicts a map of the EEC and its structural components. Over the past two decades, the government has sought to attract substantial investment in emerging businesses with significant added value. As a result, EEC rules and privileges have resulted in substantial changes to the economic environment, paving the way for rising property values in the region (Centre, 2020). The EEC provides a unique backdrop for our research since it is a newly-designated territory that is anticipated to experience an economic boom that will increase real estate prices, particularly in business and government hubs. Despite the COVID-19 pandemic, real estate developers remain optimistic that conditions will improve in the EEC region and across the nation in 2022. (Centre, 2020). According to laws, all industrial parks in the EEC region must be within a certain distance of certain urban centers. Consequently, it is important to understand how a home's proximity to business and government centers affects offers on homes.

In a highly-promoted area like EEC, price is an essential consideration for real estate developers. It is challenging for marketers to design a marketing mix operation at a level the target customers find acceptable and consequently decide to acquire. Recent academic publications have acquired data on acceptable house price offers by using a "web-crawler" script to explore the web and capture all offer details for subsequent analysis (Liang et al., 2018; Truong et al., 2020).



**Figure 1.** Geographical detail of the EEC region (EEC, 2017)

This method significantly alleviates the challenge of getting house price offer data faced by researchers. As a result, we relied on a web-crawling script to collect the cost of new single-family homes in EEC and their attributes, location, and accessibility information. We examined whether the specifics could adequately justify the pricing with the data. Our contributions would illuminate valuation in an industrially-promoted region. Based on the findings, real estate developers should modify their pricing strategies.

## 2. LITERATURE REVIEW

### 2.1 Importance of House Prices

Housing prices are significant from both an economic and a commercial perspective. According to Suman et al. (2020), home prices strongly correlate with inflation. Economic policymakers must keep an eye on home prices, particularly at the domestic level. The real estate bubble bursting is one of the most significant hazards to the world economy. In such situations, regional markets may collapse, which may impact other asset markets. From a business perspective, a home is viewed as a product sold through a seller's marketing mix. Real estate developers must provide their dwelling items to prospective buyers at competitive prices and with enticing discounts. The transaction will only occur if both sides are satisfied (Kittimunkong, 2019).

Given the relatively high real estate value, [Hussain et al. \(2021\)](#) claim that determining a suitable housing price is one of the most critical issues for developers. Customers must see the reason for the house's price and quality based on the house, its neighborhood, and its location ([Li et al., 2020](#)). How real estate developers price their housing products is sensitive to several variables. Economists and business researchers are active in the academic study of what drives house prices. Housing pricing and price indices are among the most important economic study issues ([Li et al., 2020](#); [Maqsood et al., 2019](#)). Incorporating a wide number of economic variables, [Maqsood et al. \(2019\)](#) argued that the disparities in the rise of property values between those located in the core of a country and those in coastal states necessitated the development and application of distinct forecasting models.

From a business viewpoint, academics examine housing pricing from both the buyers' and sellers' points of view. Most studies have investigated the choice to acquire a home from the buyer's standpoint. [Tan et al. \(2018\)](#) employed both qualitative and quantitative approaches to determine that the demographics of the buyer and the accessibility of the home influence the buyer's decision. Although these empirical studies from the buyer's perspective are true, they are not concerned with explaining house price offers but with the target customer's decision to acquire a home.

However, from the seller's standpoint, empirical research explaining house price offers is uncommon ([Li et al., 2020](#)). Due to confidentiality concerns, the details of the offers are mostly inaccessible ([Li et al., 2020](#)). Price determination is an element of the business plan of developers, and gathering replies to survey questionnaires can be difficult. The alternative of conducting personal interviews with the developers may ease some of their concerns with disclosing pricing offers. Still, it may result in fewer responses, reducing the statistical significance. Therefore, price offer data collection must be conducted with extreme caution.

## 2.2 Influential Factors to House Price Offers

Previous research on real estate prices has found that the house prices given by sellers are influenced by at least three distinct groupings of elements. The first category consists of all housing characteristics (e.g., the size of the living area), the second group consists of accessibility variables (e.g., the distance to the nearest river), and the third group comprises the neighborhood or locational aspects (e.g., crime rate in its community). Although we know these three types, prior research may have categorized them differently. Others may claim up to eight groups of influencing elements ([Bhor, 2020](#); [Liang et al., 2018](#); [Lu, 2018](#)).

Initially, we intended to select variables based on the two-group classification. Nonetheless, two separate subgroups were formed from the category, including elements indirectly related to the property. They are (1) descriptions of the home's accessibility and (2) descriptions of its surroundings. Consequently, the house features, accessibility

concerns, and location variables are the three potentially relevant factors upon which the current study is based. Although we utilize a three-group classification, it is important to emphasize that these three groups are not fully independent, nor do we claim to have exhausted all influential variables in our research. [Hussain et al. \(2019\)](#) stated that the selection of the components to explain house prices should not be based on a rigid conceptual framework, as the discrepancies may yield novel and intriguing discoveries.

Existing research examines the elements that determine the price of homes. [Abbasi \(2020\)](#) applied machine learning algorithms to a Kaggle-accessible dataset to accurately anticipate the price of houses. The majority of independent variables are house characteristics, such as the size of the living area and the number of bedrooms. However, his intriguing investigation did not identify the major explaining components. [Avanijaa \(2021\)](#) discovered that the number of beds and square footage were statistically significant in predicting Oregon, USA, home prices. [Xiao et al. \(2019\)](#) verified the impact of floor level and landscape proximity on home prices.

Although [Truong et al. \(2020\)](#) focused primarily on demonstrating the use of machine learning tools to improve the predictability of house prices, their inclusion of house characteristics (e.g., the number of bedrooms) and accessibility details (e.g., the distance to the subway) highlighted the significance of these constructs in explaining house prices in Beijing. Using regionally weighted regression, [Liang et al. \(2018\)](#) confirmed that proximity to a train station and a department store are important predictors of housing costs in [Liang et al. \(2018\)](#), combining empirical studies utilizing hedonic pricing modeling, concluded that the house's features, accessibility considerations, and location had substantial effects on house prices. A neighboring parcel was one of the forecasters of the price of land in Luxembourg ([Glumac et al., 2019](#)). This is empirical evidence that the characteristics of the property's location can explain its price. In truth, other location factors, such as a government-assessed land valuation, may also affect home prices ([Lu, 2018](#)).

We picked seven house qualities, five accessibility elements, and one location variable to evaluate to discover if they could explain the pricing based on the aspects found in the existing literature that affect the house prices provided by sellers. The definitions can be found in [Table 1](#). The selection of these independent factors was primarily based on findings from a survey of the relevant literature ([Li et al., 2020](#); [Liang et al., 2018](#); [Xiao et al., 2019](#)). When studying house options, Thai potential buyers frequently examine the gross floor and land area ([Wangsong, 2018](#)). In addition, the quality of important facilities such as primary schools and health organizations varies substantially in Thailand due to the government's lack of a clear quality assurance strategy. Therefore, the decision to acquire a home may be influenced less by the proximity to such amenities than by the availability of major transportation to facilitate commuting ([Wangsong, 2018](#)). This is why the current research addresses distances to main transportation alternatives. Despite our efforts to incorporate the most important aspects that may assist

explain the housing prices, we can not claim that our selection is thorough. Nevertheless, all selected constructions are unique to the EEC setting in Thailand and should account for a substantial proportion of the purchase price proposals.

As one of the location elements examined in our study, the land valuation merits further explanation. We had to concede that it was difficult to locate the important variable, particularly in the Thai setting. The difficulty may stem from the conceptual closeness between the variables in the accessibility and location groups and the lack of prior research addressing this variable. We ultimately selected the land assessment determined by the Thai Ministry of Finance's Treasury division since it represented the essence of the home's location and environmental nuances (Department, 2009). In addition, its value is changed annually and published in the Thai government gazette, ensuring its accuracy. Table 1 provides a summary of the elements that affect home price offers.

### 2.3 Concern about Collecting House Price Details

Acquiring correct and dependable data is one of the primary difficulties while attempting to justify the house price supplied by sellers. Economic research on house prices frequently relies on indices accessible from good secondary data sources, such as a World Bank report or an online library of reputable institutes (e.g., IMF or Bank of Thailand). The lack of data severely hinders research into the price from the seller's perspective due to commercial confidentiality (Liang et al., 2018). Consequently, it is unsurprising that numerous researchers have utilized data from subscribed databases. Truong et al. (2020) and Abbasi (2020)+, for example, utilized Kaggle datasets 2020. Although accurate, the data in these databases are always stagnant because they are rarely updated. Advances in Python programming and web crawling techniques enable researchers to access and extract house prices and details provided by sellers or real estate agents. The study of Guo et al. (2020) is one example of retrieving the quantitative characteristics of the properties placed on Chinese real estate websites and the linguistic announcements of houses. It validated the legitimacy of directly retrieving data from real estate websites.

In conclusion, a literature study concerning housing prices explains two research gaps. First, none of the thirteen variables from the three sets of independent factors recommended by the literature to explain housing prices have been included in a single study. Second, neither a study that employed the actual price of the houses proclaimed by sellers nor the other features of the listed properties nor one that collected actual data on the houses advertised for sale in Thailand's EEC region exist. These two difficulties represent a significant gap in the academic literature, which the current study attempts to fill. As previously stated, the primary purpose of our study is to determine if the thirteen characteristics related to houses offered for sale in the EEC region on a single real estate website adequately explain the price offers for those houses.

**Table 1. Variables and their Definitions**

| <b>Variables</b>                          | <b>Definitions</b>  |
|---|---|
| Y: House price (million baht) *           | The price of the house (baht) listed by the developers  |
| A1: Project land area (m <sup>2</sup> )   | The total amount of the land area (m <sup>2</sup> ) in the project to which the house belongs |
| A2: Gross floor area (m <sup>2</sup> )    | The area (m <sup>2</sup> ) of the house the owner can utilize                                 |
| A3: House land area (m <sup>2</sup> )     | The house's land area (m <sup>2</sup> )   |
| A4: Garage capacity (cars)                | The maximum number of cars that can park in the garage  |
| A5: Number of bedrooms                    | The total number of bedrooms in the house   |
| A6: Availability of a common pool         | Whether the project has a common pool that residents can use (1=yes; 0=no)                    |
| A7: Availability of fitness facilities    | Whether the project has fitness facilities that residents can use (1=yes; 0=no)               |
| D1: Distance to the downtown area (km)    | The distance (km) from the house to the nearest government and business center                |
| D2: Distance to Suvarnabhumi Airport (km) | The distance (km) from the house to Suvarnabhumi Airport (Thailand's national airport)        |
| D3: Distance to U-Tapao Airport (km)      | The distance (km) from the house to U-Tapao Airport (the one closest to the EEC)              |
| D4: Distance to a major river (km)        | The distance (km) from the house to the nearest river   |
| D5: Distance to a major seaport (km)      | The distance (km) from the house to the nearest seaport                                       |
| N1: Land Valuation (baht) *               | The value (baht) of the house land assessed by the Treasury Department                        |

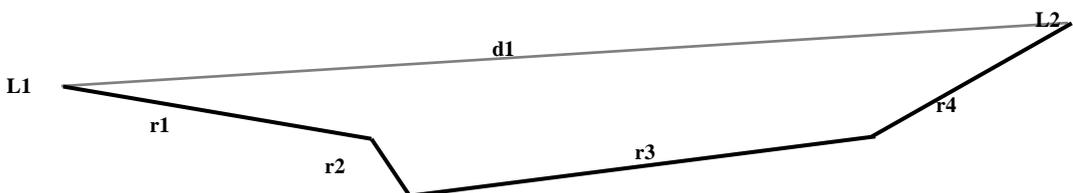
\* One USD is approximately 33.65 Thai Baht at the time of the data collection

### 3. RESEARCH METHODOLOGY

Our objective was to determine whether the thirteen variables selected from groups of influencing factors had a substantial explanatory effect on housing prices in the EEC region of Thailand. Consequently, our research methodology is quantitative, and the unit of analysis must be a single house, which is defined in this study as a new detached home located in one of the three EEC provinces. Typically, sellers are real estate developers; hence, the house is part of a real estate development project.

We designed a Python script that browsed a single real estate portal website to collect all the data necessary for our study goals. Due to research etiquette, the actual name of this property portal is being withheld. However, it is one of the leading property portals in Thailand (Umbelina, 2019). The website acts as a matchmaker between prospective purchasers and Thai real estate developers. The 'new house' portion of the website was crawled by a script that underwent multiple tests to ensure its operation. It then picked detached houses located in the three provinces of the EEC region during January and February 2020, during which we were able to record 215 new, freehold, and already-built homes placed for sale by 135 real estate developers.

The script was extracted from the sale announcements of the listed houses, the listed house price, and all seven variables of house attributes. In addition to these data, we had access to the home mapping coordinates (i.e., latitude and longitude scales), which were used to compute the distances to the five accessibility variables, and we were able to obtain the land valuation variable from the Thai Treasury Department. Two approaches can be used to estimate these distances. As depicted in Figure 2, the first technique calculates the direct distance ( $d1$ ), the Euclidean distance between the two coordinates L1 and L2, along a straight line. The second method involves the calculation of a selected Google Maps driving route between the two locations. Suppose, for instance, that Figure 2 depicts the shortest driving distance between L1 and L2 (i.e.,  $r1$ ,  $r2$ ,  $r3$ , and  $r4$ ). This would be the distance determined by the second approach. In our study, we relied on the second option because it is more applicable. All data were reviewed for quality before being recorded in CSV format in preparation for multiple regression analysis, which was used to test the hypothesis that at least one of thirteen characteristics significantly influenced the housing prices in the EEC region of Thailand.



**Figure 2.** Two possibilities for estimating a distance between two locations (i.e., L1 and L2)

#### 4. BACKGROUND OF THE COLLECTED HOUSES, DETAILS ON THEIR PRICE OFFERS, AND RELATED VARIABLES

As shown in Table 2, most collected houses (53%) were registered in Rayong, and most (57%) were single-story dwellings. We could not obtain the house dimensions from the host website; however, Thai regulations on land management prescribe that a single house for sale must occupy the land of 10,000 m<sup>2</sup> or larger, with a width of at least 10 m. As a result, we can roughly estimate that the houses in this current study would have dimensions of at least 10x20 meters. In addition, the maximum land area of the collected houses, as reported in Table 3, is 800 m<sup>2</sup>.

To analyze the details of the collected houses, we divided the developers into two groups: local and national developers. They were considered local if their housing offers were listed only in the EEC area, whereas the latter group comprised those who had offers nationwide. Comparing the two groups' house price offers confirmed that the sale prices were comparable (t-statistic = -0.785; p-value = 0.443). Based on the consistency of house pricing in our study and Wangsong (2018)'s thesis on Thai homebuyers' interest in new single-family houses, it is plausible to assert that the patterns, designs, and amenities of the gathered houses across developers are quite similar. According to Wangsong (2018), Thais desire their residences to include an average of three bedrooms, two bathrooms, a swimming pool, or a fitness center as shared amenities. Few Thai developments feature a clubhouse or sports area (See Table 2).

**Table 2. Details of the 215 Houses in the Current Study**

| Detail    |              | Counts (%) |
|-----------|--------------|------------|
| Provinces | Chachoengsao | 26 (12)    |
|           | Chon-Buri    | 76 (35)    |
|           | Rayong       | 113 (53)   |
| Styles    | One-story    | 122 (57)   |
|           | Two-story    | 88 (41)    |
|           | Three-story  | 2 (1)      |
|           | Undeclared   | 3 (1)      |

Eleven independent factors for the collected variables are quantitative, while the other two are dichotomous. The descriptive statistics of the eleven are given in Table 3, and the frequency distributions of the remaining two are shown in Table 4. Three items from these two tables should be highlighted. First, the average house price in the EEC area is approximately 3.399 million baht (One USD is approximately 33.65 Thai Baht at the time of the data collection), with an average gross floor area of 149.71 m<sup>2</sup> and a land area of 243.43 m<sup>2</sup>. Furthermore, generally speaking, the houses in the EEC area typically

have three bedrooms. Second, these residences are, on average, closer to U-Tapao Airport than Suvarnabhumi Airport.

Moreover, on average, they are 24.62 km (driving distance) from the nearest downtown area, and they are about 55 km closer to the nearest seaport than the river. The average land valuation of the collected houses, as assessed by the Thai Treasury Department, is 0.352 million baht. Finally, only about a quarter of the houses in the EEC area have access to a pool (27%) or fitness facilities (26%).

The skewness and the kurtosis statistics in [Table 3](#) validate that (1) the house price, (2) the project land area, (3) the gross floor area, (4) the house land area, (5) the garage capacity, (6) the number of bedrooms, (7) the distance to downtown (8) the distance to the Suvarnabhumi Airport, and (9) the land valuation are not normally distributed. Hence, all were transformed using a logarithm function, after which their distributions appeared normal, allowing parametric analyses to be used.

## RESULTS

The majority of significant Pearson  $r$  correlation coefficients are presented in [Table 5](#). This supports the notion of determining whether the thirteen elements have statistically significant effects on home prices. However, two modifications were made to reduce the likelihood of a multicollinearity issue. First, there is a substantial correlation between the distances to the two airports (D2 and D3) and the river (D4) (see [Table 5](#)). We opted to maintain D2 for the upcoming study and exclude D3 and D4. This is because D2 is more related to home prices than D3 and D4. The proximity of a pool (A6) and fitness facilities (A7) to the home is also highly relevant. We, therefore, eliminated A7 from the subsequent study as its association with house prices was lower than that of A6.

Consequently, there are ten independent variables in the subsequent regression analysis. [Table 6](#) displays the analysis results, revealing three significant findings. First, the  $F$  statistic of 65,500 and the  $p$ -value of .000 show that at least one of the independent factors significantly affected the price. [Table 6's](#) figures confirm the strong impact of four parameters on house price: the gross land area, the closeness of a pool to the house, the distance between the house and downtown, and the land valuation. The modified  $r^2$  value of 0.686% confirmed the acceptability of the impacts of the four relevant factors on the home price. In addition, the tolerance and VIF statistics in [Table 6](#) indicate that the problem of multicollinearity is manageable. In addition, the Durbin-Watson statistic of 1.709 indicates that autocorrelation in the residuals is not a significant worry. These details validate the quality of the results of the regression analysis. [Table 6](#) provides four additional conclusions based on the unstandardized (B) and standardized (Beta) regression coefficients for the four important factors determining the price of new residences offered by developers in the EEC area.

**Table 3. All Quantitative Variables and Descriptive Statistics**

| <b>Variables</b>                          | <b>Average</b> | <b>Standard Deviation</b> | <b>Minimum</b> | <b>Maximum</b> | <b>Skewness</b> | <b>Kurtosis</b> |
|---|----------------|---------------------------|----------------|----------------|-----------------|-----------------|
| Y: House price (million baht) *           | 3.399          | 0.0043                    | 1.050          | 19.000         | 4.30            | 28.91           |
| A1: Project land area (m <sup>2</sup> )   | 49,665.54      | 59,144.469                | 800.0          | 480,000.0      | 3.73            | 20.57           |
| A2: Gross floor area (m <sup>2</sup> )    | 149.71         | 55.960                    | 52.0           | 600.0          | 3.23            | 21.80           |
| A3: House land area (m <sup>2</sup> )     | 242.43         | 80.782                    | 140.0          | 800.0          | 3.78            | 19.02           |
| A4: Garage capacity (cars)                | 1.65           | 0.681                     | 0.0            | 4.00           | -1.31           | 1.45            |
| A5: Number of bedrooms                    | 2.95           | 0.507                     | 2.0            | 5.0            | 0.14            | 1.89            |
| D1: Distance to the downtown area (km)    | 24.62          | 19.984                    | 2.2            | 91.6           | 1.50            | 2.03            |
| D2: Distance to Suvarnabhumi Airport (km) | 118.89         | 41.014                    | 22.1           | 186.0          | -.55            | -1.16           |
| D3: Distance to U-Tapao Airport (km)      | 60.85          | 35.377                    | 9.7            | 146.0          | .65             | -.56            |
| D4: Distance to a major river (km)        | 102.35         | 44.966                    | 5.0            | 166.0          | -.70            | -.87            |
| D5: Distance to a major seaport (km)      | 55.40          | 19.543                    | 5.4            | 99.0           | -.42            | .05             |
| N1: Land Valuation (baht)*                | 352,374.6      | 313,154.1                 | 20,800.0       | 2,400,000.0    | 2.38            | 9.68            |

\* One USD is approximately 33.65 Thai Baht at the time of the data collection.

**Table 4. Frequency Distribution Of The Pool and Fitness Center Variables (n=215)**

| Variables                              | Value | Counts (%) | House price offer (baht)* |
|--|-------|------------|---------------------------|
| A6: Availability of a common pool      | Yes   | 57 (27)    | 4,587,170.21              |
|  | No    | 158 (73)   | 2,969,716.15              |
| A7: Availability of fitness facilities | Yes   | 55 (26)    | 4.042,711.11              |
|  | No    | 160 (74)   | 3,179,834.09              |

\* One USD is approximately 33.65 Thai Baht at the time of the data collection.

First, based on its Beta value of 0.59, the house's gross floor space appears to have the greatest influence on the house prices collected from the real estate website. Second, the land value's Beta of 0.300 had the second most impact. The closeness of a swimming pool to the home was the third most influential factor. Considering the binary character of the pool variable, we compared the prices of residences with and without access to a pool. The t-statistic of -4,041, along with the p-value of .000, proved a statistically significant difference between the house prices of these two groups. In addition, the statistics in [Table 4](#) appear to confirm that residences with a pool nearby are priced higher than those without it. The distance between the gathered residences and the city center has the least influence on the house prices. In conclusion, the findings are discussed in greater detail.

## 5. CONCLUSION AND DISCUSSION

Given our intention to validate whether the thirteen elements affect house prices in Thailand's EEC area, a Python script was used to collect the prices stated on a single real estate website as well as the seven characteristics of the houses. With the mapping details of the observed dwellings, we could also compute the remaining six accessibility element factors and the location attribute for each house. During the two-month data collection period, information on 215 homes was gathered for examination. The analysis results indicate that residences in the EEC region were listed at an average price of 3,399 million baht, with an average land area of 243.43 m<sup>2</sup>. Most of the homes were in subdivisions that lacked a community pool or fitness center. Regarding location, the observed residences were closer to U-Tapao Airport than Suvarnabhumi Airport, most of which were within 24.62 kilometers of the city center. The average land value of the dwellings collected was 352,374.6 baht. We exerted effort to discover a publication that described the observed homes so we could compare our findings. Only news articles or reports from Thailand's Government Housing Bank (GHB) and National Housing Authority (NHA) indicated that the average price of single-family residences in the EEC region was 2,230,000 baht ([Centre, 2020](#)). Our study's average price of 3.399 baht is 1.5 times more than the average price indicated in GHB's report; nonetheless, it is within the range of 1 to 4 million baht ([Srimalee, 2019](#)) or 1.5 to 3 million baht ([Srimalee, 2019](#)). Therefore, the dwellings seen in the present study appear to represent the houses in Thailand's EEC region accurately.

**Table 5. Correlation Matrix**

| Variables  | A1    | A2    | A3    | A4    | A5     | A6    | A7    | D1    | D2     | D3     | D4     | D5     | N1     |
|--|-------|-------|-------|-------|--------|-------|-------|-------|--------|--------|--------|--------|--------|
| Y: House price (baht)                            | .288* | .708* | .414* | .286* | -.418* | .446* | .315* | .155* | -.110  | .001   | -.104  | -.278* | .533*  |
| A1: Project land area (m <sup>2</sup> )          | 1     | .111  | -.090 | .184* | .156*  | .326* | .398* | -.125 | -.414* | .334*  | -.375* | -.072  | .531*  |
| A2: Gross floor area (m <sup>2</sup> )           |       | 1     | .423* | .293* | .498*  | .295* | .183* | -.051 | -.006  | -.113  | -.013  | -.072  | .420*  |
| A3: House land area (m <sup>2</sup> )            |       |       | 1     | .038  | .187*  | -.039 | -.036 | .110  | .217*  | -.270* | .205*  | -.010  | .288*  |
| A4: Garage capacity (car)                        |       |       |       | 1     | .162*  | .073  | .063  | -.013 | .231*  | .136   | -.209* | -.087  | .209*  |
| A5: Number of bedrooms (room)                    |       |       |       |       | 1      | .164* | .186* | .049  | -.136* | .090   | .121   | .011   | .256*  |
| A6: Whether a pool is in proximity to the house  |       |       |       |       |        | 1     | .807* | .115  | .011   | -.094  | .020   | -.217* | .285*  |
| A7: Whether fitness is in proximity to the house |       |       |       |       |        |       | 1     | .067  | -.016  | -.031  | -.006  | -.147* | .271*  |
| D1: Distance to downtown (km)                    |       |       |       |       |        |       |       | 1     | .182*  | -.247* | .247   | -.305* | -.097  |
| D2: Distance to Suvarnabhumi Airport (km)        |       |       |       |       |        |       |       |       | 1      | .877*  | .947*  | -.033  | -.292  |
| D3: Distance to U-Tapao Airport (km)             |       |       |       |       |        |       |       |       |        | 1      | -.901* | .241*  | .140   |
| D4: Distance to the nearest river (km)           |       |       |       |       |        |       |       |       |        |        | 1      | -.001  | -.296* |
| D5: Distance to the nearest seaport (km)         |       |       |       |       |        |       |       |       |        |        |        | 1      | .240*  |
| N1: Land valuation (baht)                        |       |       |       |       |        |       |       |       |        |        |        |        | 1      |

\* Significant at the 0.05 level.

**Table 6. Regression Analysis Outcome\***

| Variables                                      | B     | Beta  | t-statistics | P-value | Tolerance | VIF   |
|--|-------|-------|--------------|---------|-----------|-------|
| A1: Project land area (m <sup>2</sup> )        | -.009 | -.034 | -.525        | .601    | .657      | 1.523 |
| A2: Gross floor area (m <sup>2</sup> )         | .776  | .590  | 9.833        | .000    | .740      | 1.352 |
| A3: House land area (m <sup>2</sup> )          | .097  | .035  | .584         | .560    | .734      | 1.362 |
| A4: Garage capacity (cars)                     | -.004 | -.013 | -.225        | .822    | .855      | 1.169 |
| A5: Number of bedrooms                         | .134  | .047  | .769         | .444    | .725      | 1.379 |
| A6: Whether a pool is in the house's proximity | .138  | .149  | 2.634        | .010    | .836      | 1.196 |
| D1: Distance to downtown (km)                  | .064  | .131  | 2.490        | .014    | .967      | 1.034 |
| D2: Distance to Suvarnabhumi Airport (km)      | -.047 | -.025 | -.430        | .668    | .781      | 1.281 |
| D5: Distance to the nearest seaport (km)       | -.001 | -.024 | -.400        | .690    | .750      | 1.333 |
| N1: Land valuation (baht)**                    | .133  | .300  | 5.187        | .000    | .795      | 1.258 |

\*Adjusted r<sup>2</sup> is 0.686 with the Durbin-Watson of 1.709

\*\* One USD is approximately 33.65 Thai Baht at the time of data collection.

We were forced to eliminate three independent variables based on the correlation analysis to minimize the multicollinearity problem. The three are the distances from the collected residences to U-Tapao International Airport, the nearest river, and the proximity of fitness facilities to the house. This leaves eleven independent variables remaining. The analysis findings indicate that the selected criteria adequately explain 68.6% of housing prices. This conclusion contributes to the body of empirical research demonstrating that the housing prices stated by sellers are substantially influenced by the accessibility quantity and the location component. This is consistent with prior research (Guo et al., 2020; Hussain et al., 2021; Lu, 2018; Xiao et al., 2019).

The prices were found to be significantly explained by two housing attributes. They are the home's gross square footage and proximity to a pool. Both favorably affect the pricing (see Tables 4 and 6). This result is consistent with prior research (Abbasi, 2020; Avanijaa, 2021). The positive connections were not unexpected because, intuitively, a home with a larger floor area or pool access would be expected to be more expensive than one with a smaller floor area or no pool access. However, it was discovered that the largest influence on the price of a home is the total square footage (see Table 6). The size of a home's interior and exterior areas in the EEC region significantly impacts how developers price their offerings.

Regarding accessibility issues, the logical result suggests that the house price is positively correlated with the distance between the house and the downtown region, which includes government and business offices, i.e., the greater the distance, the more expensive the house. This may represent the real estate developer's strategic belief that their target market prefers to reside away from downtown's turbulent business traffic. In an industrially-promoted region such as the EEC, all industrial parks must maintain a certain distance between their offices and the government and commercial center. Contrary to the common perception that costly houses should be located near the city center, real estate developers set their prices accordingly. This discovery is our sole academic contribution to the field. Due to the lack of earlier publications on the specifics of the properties, particularly in the EEC region, we cannot offer more commentary; instead, we rely on other real estate experts to describe the attributes and pricing of observed houses. Land valuation's significance demonstrates location variables' impact on understanding home prices. Based on the information Thailand's Treasury Department provided regarding the house's location, the land valuation indicates the worth of the land on which the house is built. Logic dictates that it should clearly explain the house price offer, and our finding provides empirical support for this notion.

The less significant factors merit more discussion. Two alternative reasons exist for the lower degree of significance. First, two sections of the gathered houses (A1 and A3) and the distance to the harbor (D5) exhibited a significant link with the land worth, which has been demonstrated to explain house prices. Consequently, the effects of these variables were insignificant. Second, the garage capacity (A4) and the number of

bedrooms (A5) exhibited little fluctuation (i.e., their variances were less than one), and hence, their effects on home prices were unnoticeable. According to Wangsong (2018), such low variation may result from Thai homebuyers' widespread desire for an average of three bedrooms and a two-car garage. In addition, Hussain et al. (2021) determined that the garage capacity was minimal.

## 6. RESEARCH IMPLICATIONS

Our discoveries contribute both theoretically and practically. Theoretically, the study provides three insights into the elements that influence the sale price of properties in Thailand's EEC region. The first of our original theoretical contributions is an understanding of the strong beneficial effect that proximity to the city center has on property price offers in the EEC. Typically, residences close to the government or corporate centers are priced at a premium. However, in industrially-promoted regions, such as the EEC, the cost of homes further from urban centers is higher. Second, land assessments may have been neglected in the current literature. This may be because Thailand is unique. After all, the government updates these statistics annually. Other real estate scholars may wish to add the land valuation to validate its conceptual utility. Given the application of the land valuation in our study and its potential uniqueness in the Thai environment, foreign real estate scholars must not only follow the prior work in the field but also search for a construct suitable for their contexts. This may contribute significantly to their theoretical research. Lastly, by crawling the website with a script, we acquired actual price offers and descriptions of the residences, which supplied a record of the accessibility and location constructs. Developers' actual house pricing is difficult due to the need to maintain commercial confidentiality. Consequently, we advise housing researchers to employ the crawling method, which may generate data of acceptable quality.

Our findings propose practical recommendations for two stakeholder groups. The first is for real estate builders that wish to improve their pricing processes. They should pay specific attention to house characteristics, accessibility concerns, and location factors since our research indicate that these three sets of variables are significant. The gross floor size and land value must be prioritized due to their relatively substantial influence on home values. Due to the Treasury Department's official sanction, developers whose target consumers are located in Thailand may wish to apply the numerous approaches available for appraising land worth (Department, 2009). Even though these contributions may benefit Thai society, foreign real estate stakeholders can also profit from our findings. For instance, housing developers in nations with a specially designated area comparable to Thailand's ECC may use the factors and data-gathering methodologies used in the current study to set prices for property offers. Those interested in acquiring a home in the EEC region are the target of the second recommendation. The findings may assist them in determining whether the offered housing price is appropriate. Aware that the house prices in this location are positively correlated with (1) the distance to the

city center and (2) the land value, prospective purchasers may wish to determine whether the prices offered by developers appear to reflect these correlations.

## 7. LIMITATIONS AND FUTURE RESEARCH DIRECTION

Similarly to other studies, ours has limitations. Even though our Python script for data collecting was constructed correctly, it is possible that not all data was obtained. This could be the outcome of numerous house listing types on a website. While the screen display may have a similar appearance, the display engine may be technically distinct. Despite our best efforts to account for all possible variations, we must note this potential limitation.

Given the scope of the current research, we propose two avenues for future study. First, it is strongly recommended to conduct a replication of a similar inquiry in a specially advertised location. The results may demonstrate either (1) the similarity to ours that contributes to the vast body of information or (2) the study's uniqueness on this topic. It may also highlight the region's exceptional research potential. Second, the levels of the data involved in the current investigation vary. For example, the project land area is at the home level, although the land valuation may be at the project level. In light of this, future research should incorporate a multi-level approach (Antonakis et al., 2021).

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