

## HOUSING ATTRIBUTES INFLUENCE THE HOUSING PRICE: THE STUDY OF MIDDLE CLASS HOUSING IN EAST SURABAYA

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### Abstract

Middle class housing have highest increase for sale growth in Indonesia. It also happens in Surabaya, especially East Surabaya after Middle East Ring Road (MERR)-IIC is opened. Before buying a house, household make valuation of the house product based on the housing attributes offered by the developer: physical attributes, neighbourhood characteristics, and location. Household will bargain based on the attributes of the house. However, developers usually cannot make exact calculation about the influences of some of those attributes on the house price. The objective of this research is to identify the influences of housing attributes and their value variations on the middle class housing price in East Surabaya. This research uses quantitative approach. The respondents are people purchasing middle class houses in the last five-years (2011-2015). The data were collected by doing structured interview to 111 respondents selected based on purposive sampling technique. This research uses multiple regression technique to analyze the data. This research found there are nine attributes simultaneously influence the house price. However, some attributes have significant influence and other do not.

**Keywords—** *Customer's valuation, housing attributes, housing price, middle class housing.*

### 1. INTRODUCTION

Bank of Indonesia (BI) stated that middle class housing sale had the highest growth compared to other housing types, by 33,6% in first quarter of 2013. Executive Director of Bank of Indonesia Communication Departement, Difi Johansyah, said that the growth was influenced by middle-class society growth.

This phenomenon also happened in Surabaya, especially East Surabaya. Former Chairman of REI (Real Estate Indonesia) of East Java, Erlangga Satriagung, said that the sale growth of middle class housing is also influenced by the access of Middle East Ring Road opened in East Surabaya.

For household, buying a house is considered as the greatest expense. Therefore, the housing price is the main consideration for them [2]. Tambunan (2009) adds that in general, the more expensive the product, the more consideration customers need to decide whether they'll buy it or not [3]. For housing product, the consideration is in the form of valuation toward housing attributes [4]. In general, the housing attributes which are estimated to be able to influence the housing price are physical attributes, neighborhood characteristics, and location [5].

The housing price is obtained from process of a negotiation between buyer and seller. The candidate of buyer (or in this case is household) will bargain based on their valuation of the housing attributes [6]. However, the house dealer (housing developer) do not usually analyze customer preference for deciding on the price for their houses. They refer to their experience in selling their similar products, their own calculation, and their assumption without any scientific research. It causes they cannot offer an optimal price. It concludes that there is difference between developers and household in price perception [7]. Specifically, developers usually cannot make exact calculation of the influences of neighborhood characteristics (such as distance from CBD, distance from school etc) on the house price, says Vica Yustisiana Wirastuti (42 years old), general manager of Citra Garden Sidoarjo Housing. In other words, in general developers cannot calculate empirically some change of housing attributes, or variation of housing attributes such as "how much is additional price of house for each kilometer further to CBD?" or "do education facilities around the houses make the price rises or drops?" it is similar to the statement of DiPasquale and Wheaton (1996) who state that the price of each

attribute is never directly calculated in housing marketing [4]. Whereas, neighborhood characteristics is the attribute calculated by household before they decide to buy [6].

## 2. LITERATURE REVIEW

There have been many theories and researches about the influences of housing attributes on the housing price. Those researches study different housing attributes although there are some researches that study the same/ similar housing attributes. But not all of that attributes can be studied here, in Surabaya, considering some differences of housing characteristics and the respondent's culture compared to other research. Therefore, this research needs references from previous researches that study housing attributes (research variables) which are relevant to be studied in this research. Some of those previous researches can be used as references but it needs tight selection, in order to get the housing attributes that are suitable to be studied in this research. McDonald and McMillen (2007) said that customer will not consider all housing attributes before they buy a house. Therefore, it is recommended to limit attributes or variables to value a house [6].

These are similar researches which can be used as references: Cebula (2009) [9], Ottensmann (2008) [10], Bayuprima (2015) [11], Asmawi, dkk (2014) [12], Wen, dkk (2014) [5], and Goix and Vesselinov (2011) [13]. However, tight selection for variables is needed.

Cebula (2009) studied about the influences of housing attributes in historical city, Savannah, Georgia. Variables used were amount of bathroom, amount of bedroom, lot width, amount of fireplaces, brick usage for wall building, availability of verandas, availability of yards, availability of basement sprinkler system, the number of storeys, exterior condition (stuccoed or not), garage width, availability of pool, the age of house structure, nearness to the park, the location (at the corner or not) (at no-through lane or not) (near lake, river, or not) (2-block away from apartment complex or not) (around congested area in Savannah or not), the time of offer closing (in may, june, or july) house status (national historic building or not) [9].

Ottensmann (2008) studied the influences of housing attributes on the housing price, especially attributes of distance and duration from home to office in CBD. The variables are: amount of bathroom, amount of rooms, building width, lot width, basement availability, age of the building, garage availability, veranda availability, materials for exterior (using brick or not), availability of Air Conditioner, value of Effective Tax Rate, average of school test score in neighborhood, median of people's income, percentage of black race, percentage of vacant homes, location (located at downtown or not), and distance to CBD [10].

Bayuprima (2015) studied the influence of public facilities in housing toward housing price in Magapura area. Variables used are: availability of road, availability of PDAM, availability of sewage works, availability of rain water processing, availability of waste disposal system, availability of electricity power, availability of telephone network, accessibility of public transportation [11].

Asmawi and friends (2014) studied the influences of public green space in city toward the housing price in Malaysia. Variable used is availability of greening sites [12].

Wen and friends (2014) studied the influences of the distance of education facilities on the house price in China. Variable used is the distance from home to various education facilities [5].

Goix and Vesselinov (2011) studied the influences and role of security system "gate community" or "one-gate system" in housing on the housing price in South Carolina [13].

From the attributes/ variables studied in those researches, the selection or limitation of research variables to be used in this research can be done in some steps: through identifying housing attributes that have been studied the most, and identifying the housing attributes that have been proven to be able to influence the housing price. Then the housing attributes identified by those two methods are selected once again, based on the appropriateness to the middle class housing and people characteristics in East Surabaya. In addition, the selection or limitation of variables also can be done by considering experts' opinion and the result of prior researches.

From those housing attributes, the most used attributes in researches are amount of bathrooms, amount of rooms, lot width, age of the house, availability or width of garage, and availability of veranda. From those attributes mentioned above, the most relevant attributes to be studied in this research are amount of rooms, amount of bedroom, and lot width. Age of house is not relevant because now buyers have to make indent to buy houses from developers. The houses will be built after the transaction is done. It means the customers will have new built houses. Availability of garage and veranda are not relevant because this research studies

middle class housing featuring one floor and no garage (carport only). So, availability of garage and veranda and age of house are not used any longer.

The next step is to identify the influential attributes on the house price. These are the following influential attributes to the house price in each research:

1. Cebula (2009): amount of bathrooms, amount of rooms, lot width, building width, amount of fireplaces, the number of storeys, availability of yard, availability of pool, exterior condition (stuccoed or not), and availability of underground sprinkler system [9].
2. Ottensmann (2008): amount of bathroom, lot width, availability of basement, availability of air conditioner, the average of school test score, distance to CBD [10].
3. Bayuprima (2015): road width in housing [11].
4. Asmawi, dkk (2014): availability of public green space in cities [12].
5. Wen, dkk (2014): distance from home to education facilities [5].
6. Goix & Vesselinov (2011): availability of security system “one-gate system” [13].

Irrelevant attributes of those researches are: amount of fireplaces, the number of storeys, availability of yard, availability of pool, exterior condition (stuccoed or not), availability of underground sprinkler system, availability of basement, and availability of air conditioner because middle class housing owned by respondents do not have those attributes. In addition, availability of yard and exterior condition are not relevant because every middle class housing in Indonesia has these attributes.

The remaining attributes are amount of bathrooms, amount of rooms, lot width, building width, road width in housing, distance to CBD, availability of public green space in cities, distance from home to education facilities, availability of security system “one-gate system”. Previous researches stated that distance to CBD and availability of public green space in cities do not have significant influences on the house price. However, some experts like Henderson in Sidik (2000) [14], Sidik (2000), dan Hidayati dan Harjanto (2003) [15] state that the distance from home to CBD has positive influence on the house price. Guntoro (2011) [16] says green housing has high demand by society in West Surabaya. So, the nine remaining attributes can be used as variables in this research.

As stated before, housing attributes which generally are estimated to influence housing price consist of three kinds, that is physical attributes, neighbourhood characteristics, and location [5]. When the three kinds of attributes are linked with nine attributes selected of previous researches, that nine attributes are able to be categorized as physical attributes (building width, lot width, amount of rooms, and amount of bathrooms), neighbourhood characteristics (availability of one-gate system, availability of public green space, road width in housing), and location (distance from home to CBD, and distance from home to education facilities). Therefore, the nine housing attributes or research variables are used as the indicators of the three groups of housing attributes which seen in Table 1 below:

Table 1. Variables and Research Indicators

Variable	Indicator
Physical Attributes	Building width
	Lot Width
	Amount of rooms
	Amount of bathrooms
Neighborhood Characteristics	Availability of security system “One gate system”
	Availability of public green space in City
	Road width in Housing
Location	Distance from home to CBD
	Distance from home to education facilities

### 3. METHODOLOGY

The objectives of this research IS to identify the influences of housing attributes and their various values on the price of middle class housing in East Surabaya. This research uses quantitative approach. As this research aims to identify the influences between variables used, it is categorized as a quasi experiment which

contains causability relationship [17]. The important thing to take into account is this research studies the influences of housing attributes on the housing price in customer's/ household point of view. The other factors, especially developer's point of view, are not taken in this research.

Two kinds of variables are used in this research, independent variable and dependent variable. The independent variables in this research are three groups of house attributes, they are physical attributes, neighbourhood characteristics and location as stated in Table 1 above, which consist of nine house attributes, they are building width, lot width, amount of rooms, and amount of bathrooms, availability of one-gate system as security system, availability of public green space, road width in housing, distance from home to CBD, and distance from home to education facilities. While the dependent variable is the price of middle class housing in East Surabaya. The price itself is amount of money used in transaction between buyers and the developers which is agreed by them and the transaction is done based on the price.

The population of this research is the respondent or society or customers of middle class houses (type 36-70, single storey house) in East Surabaya and the attributes are facilitated or built by developers, not developed by the buyers, and the houses are bought at least in 2011.

There are approximately 2215 middle class houses (one house is owned by one respondent) in 13 housings, that is Sukolilo Dian Regency 2 and City Home Regency (Sukolilo District), Grand Semanggi Residence, Green Semanggi Mangrove, and Green Lake (Rungkut District), and Citra Medayu Residence, Taman Rivera, Puri Gunung Anyar Regency, Puri Jimbaran Regency, Sentra Point, Tira Medayu, Pesona Alam Gunung Anyar, and Gunung Anyar Permai Regency (Gunung Anyar District), located in East Surabaya. They are the population of the research.

From that population, respondents are selected by using purposive sampling technique. The number of sample of this research is determined by using this following Slovin Formula [18]:

$$n = \frac{N}{1 + Ne^2}$$

n : The number of sample

N : The number of population

e : Expected Critic value of s (accurateness limit), in other words percentage of inaccurateness concession because of sampling error

The critic value of this research is 10%. Based on Slovin Formula, it is found the minimum number of sample needed is 96 respondents.

From the thirteen housings, only eight housings are selected. They are City Home Regency (Kecamatan Sukolilo), Grand Semanggi Residence, Green Semanggi Mangrove, Green Lake (Kecamatan Rungkut), Citra Medayu Residence, Puri Gunung Anyar Regency, Pesona Alam Gunung Anyar, and Gunung Anyar Permai Regency (Kecamatan Gunung Anyar). The selection takes some consideration, such as the ease of getting permit to conduct survey and time efficiency in conducting survey.

Data collecting is conducted through structured interview to respondents and observation on the housing attributes. Respondents will be interviewed about their identity, housing attributes as independent variables of this research, and housing price when their houses are bought from developers. Housing attributes interviewed are building width, lot width, amount of room, amount of bathroom, availability of one-gate system, and public green space. Data of other attributes such as road width in housing, distance to CBD, distance to education facilities are collected through observation and valuation. Measurement of road width is done by using measuring tape while measurement of the distance between homes to CBD is helped by Google Map. All data of respondents' housing attributes are ratio scale, except availability of one-gate system security system and availability of public green space. Both of them are nominal scale data, which the data are in form of category[17]. The category for both attributes is whether they are available or not available. For example, the score is one (1) if greening site is available in housing and the score is zero (0) if public green space is unavailable. These two attributes are called dummy variables as well. All attributes measurements use meter unit except distance uses kilometer. Housing price is converted into recent Indonesia Rupiah currency (2016). It is because in this research there is difference of the value of money year by year, especially 2011-2015. All the price of respondents' house are converted by using average of inflations happen in 2011-2015 for expense of a house according to the Consumer Price Index (IHK) 2011 [19], 2012 [20], 2013 [21], 2014 [22] and 2015 [23].

Data analysis in this research uses multiple linear regression technique. After result is obtained, inferential statistic is used to more deeply analyze about the influence of each independent variable on the dependent variables so that conclusion is obtained. It is conducted by connecting the result of multiple linear regression with various related references, respondents data, and data of respondents' housing attributes.

## 4. ANALYSIS AND RESULT

### 4.1 General Description of Research Variables

The average of the building width of middle class housing in this research is 43.2 m<sup>2</sup>. The width of the largest building is 70 m<sup>2</sup> and the smallest one is 36 m<sup>2</sup>. While the average of the lot width of middle class housing in this research is 86.4 m<sup>2</sup>. The width of the largest lot is 128 m<sup>2</sup> and the width of the smallest is 66 m<sup>2</sup>. Compared with building width, the lot width is 201% in average, which is about two times larger than building width.

The houses that being observed at least have 2 rooms, and 3 rooms the most. In other hand, those houses at least have 1 bathroom. 2 bathrooms are the most number of bathroom available.

The majority of the housings provide one gate system (87.5%). It indicates that both Customers and developers prefer one gate system as their security system. However, there are only 62.5% housings provide public green space. Compared to the availability of one gate system, public green may be considered as less important.

The average road width in housing studied in this research is 6,4 m. The widest road is 10 m and the narrowest road is 3,8 m. While the average of the distance to Central Business District (CBD) is 4,689 km. The furthest distance to CBD is 8.8 km, that is from Puri Gunung Anyar Regency to CBD. The nearest distance to CBD is 2 km, that is from Gunung Anyar Permai Regency to CBD.

Another thing to know is there are some changes in variable "distance from home to CBD" for some middle class housing in East Surabaya in last five years. It is influenced by the opening of MERR IIC, and several developments constructed around the street. For example is the case of Green Lake Regency. Before 2013 the nearest CBD from that housing to CBD is Jalan Prapen, Tenggilis Mejoyo District, East Surabaya. The distance between Green Lake Regency and Jalan Prapen is around 6.6 km. Before 2013 Jalan Prapen became the nearest CBD for Green Lake Regency. For information, MERR IIC was still under construction along 2011, and the street was open in early 2012. At that time MERR IIC was not the CBD because its neighborhood was still under development as new business centers. In 2013 various business centers emerged such as Central Business Park Semampir, Semampir Shophouse, Baruk Shophouse, etc. Therefore, in 2013 MERR IIC became the nearest CBD for Green Lake Regency, for about 3.4 km in distance.

The distance from home to education facilities is 1.5 km in average. The furthest distance is 2.5 km, that is Puri Gunung Anyar Regency, and the nearest distance is 0.27 km, that is Pesona Alam Gunung Anyar.

The average price of middle class housing in East Surabaya is Rp 450,108,736.63. The highest price is Rp917,921,593.37, that is Green Lake, and the lowest price is Rp 257,798,187.76, that is Citra Medayu Regency. The houses in Green Lake are the most expensive because the houses are type – 70, the highest class in middle class housing. And houses in Citra Medayu Regency are the cheapest because the houses are type – 36, the lowest class in middle class housing.

### 4.2 Classic Assumption Test

The first thing to do before running the multiple analysis regression, classic assumption test which contains of normality test, heteroskedasticity test, multicollinearity test, autocorrelation test must be conducted. It is done to make sure that multiple linear regression model is BLUE (best linear unbiased estimator).

The respondent's data in this research is determined as normal distributive based on Kolmogorov Smirnov Test (normality test) as the significance value is 0.515 > 0.05. They do not contain multicollinearity within dependent variables as all the VIF value < 10. They also do not contain autocorrelation as the Durbin Watson value is 2,026 which is between dU (1,87) and 4-dU (2,13).

The respondent's data have passed the 3 classic assumption test. However, it is found that there is an independent variable which has rank spearman correlation significance < 0,05. This result shows that there is a heteroskedasticity in prior data regression. To overcome this, outlier detection with casewise diagnostic is

needed. Outlier detection finds 10 outlier respondents. Then, those 10 outlier respondents are reduced and excluded to regression analysis process.

After reduce the outlier data, the value of Rank Spearman correlation significance of all independents variables  $> 0.05$ . It concludes that there is no heteroskedasticity in non outlier data regression. Therefore, the next analysis uses regression with 101 respondents.

#### 4.3 Multiple Regression Analysis

Table 2 shows F Test results significance value  $0,000 < 0.05$ . It concludes that building width, lot width, amount of room, amount of bathroom, availability of security system (one gate system), availability of public green space, road width in front of house, distance to CBD, and distance to education facilities simultaneously have significant influences on the price of middle class housing in East Surabaya. While Table 3 shows the nine attributes of house in this research simultaneously influence 0.796 or 79.6% on the price of middle class housing in East Surabaya.

Table 2. Simultant Influence Test (F Test)

Model	Sum of Squares	df	Mean Square	F Value	Sig.
Regression	1082132305851020000	9	1120236922872335500	39,425	0,000
Residual	277528787434444300	91	3049766894884003		
Total	1359661093285464000	100			

Table 3. R Square

R	R Square
0.892	0.796

In other hand, Table 4 shows that some attributes significantly influence the housing price while others do not. Attributes which have significance value  $< 0.05$  have significant influences. They are building width, amount of rooms, amount of bathrooms, availability of public green space, width road in front of house, distance to CBD, and distance to education facilities. On the other side, Attributes which have significance value  $> 0.05$  do not have significant influences. They are lot width and availability of security system (one gate system). Another thing to know is every change of housing attributes which have significant influences significantly changes the housing price itself. And every change of housing attributes which do not have significant influences does not significantly change the housing price.

Table 4. Partial Influence Test (t-Test)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	S.E	Beta		
(Constant)	-370766168.214	60059345.309		-6.173	0.000
Building Width	6369684.150	1571485.595	0.383	4.053	0.000
Lot Width	-373284.499	744632.525	-0.045	-0.501	0.617
Amount of Room	185464685.712	30431033.867	0.406	6.095	0.000
Amount of Bathroom	58264311.928	24901294.515	0.156	2.340	0.021
Availability of Security ( <i>One Gate System</i> )	25692396.430	21983340.660	0.074	1.169	0.246
Availability of greening sites	62574530.553	14775233.672	0.233	4.235	0.000

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	S.E	Beta		
Road Width in front of Home	10623871.191	4203794.227	0.149	2.527	0.013
Distance to CBD	-12688478.628	2848302.912	-0.227	-4.455	0.000
Distance to Education Facilities	29580865.779	10745929.695	0.172	2.753	0.007

In addition, through t-Test or Table 18, we also able to derivate this multiple regression equation:

$$\text{Housing Price} = -370.766.168,214 + 6369684,150 X1 - 373284,499 X2 + 185464685,712 X3 + 58264311,928 X4 + 25692396,430 X5 + 62574530,553 X6 + 10623871,191 X7 - 12688478,628 X8 + 29580865,779 X9$$

X1 is building width, X2 is lot width, X3 is amount of rooms, X4 is amount of bathroom, X5 is availability security system one gate system, X6 is availability of public green space, X7 is road width in front of house, X8 is distance to CBD, dan X9 is distance to education facilities.

Using multiple regression equation above, the change of housing price can be predicted when there is change in every housing attributes. In other words, multiple regression equation can be used to identify implicit price [4] of each house attribute. It can be done by using these following steps:

1. Insert value assumption of nine housing attributes into multiple regression equation
2. Next, calculate the housing price house based on this assumption.
3. Change the value of one of the housing attributes without change the value of other 8 attributes.
4. Calculate the housing price obtained after changing one of the attributes.
5. Compare the housing price before and after the housing attributes being changed.
6. Repeat the steps 1-5 but by using other attributes. Calculate them repeatedly until all attributes are used.

Based on the steps above, the results are:

- a) Every 1 m<sup>2</sup> additional width of building adds Rp6,369,684.15 to housing price. Conversely, every 1 m<sup>2</sup> reduced width of building reduces Rp6, 369,684.15 to housing price (by assumption that there are no change of other attributes). This condition may influenced by the majority of housing occupants number, majority of middle class housing occupied, and standard of space needed for housing for each m<sup>2</sup> per each occupant. It may also happened because majority of respondents really need additional space so that they are willing to pay relatively expensive price for additional building width.
- b) Every 1 m<sup>2</sup> additional lot width reduces Rp373, 284.50 of housing price. Conversely, every 1 m<sup>2</sup> reduced Rp373, 284.50 of housing price (no change at other attributes). This condition may influenced by customer's preference and priority. They prefer additional space of building width to additional width lot. By observation, it can be seen that there are relatively many houses do not remain space or small garden in front of the houses. The owners use vacant ground to make additional space for their building by applying additional tiles. In addition, most of the houses have lot width 201% compared to the building width, which make them pay higher land tax.
- c) Every one additional room adds Rp 185, 464,685.71 of housing price. Conversely, every one room less reduces 185, 464,685.71 of housing price (no change at other attributes). This condition may influenced by the composition of middle class housing occupants in East Surabaya, which in particular condition (couple of children grow up, or there is maid) causes the household need more rooms and they are willing to pay relatively expensive price for extra room inside the house.
- d) Every one additional bathroom adds Rp58, 264,311.93 of housing price. Conversely, every one bathroom less reduces Rp58, 264,311.93 of housing price (no change at other attributes). It probably because extra bathrooms are frequently needed, especially, some members of household need bathroom simultaneously.
- e) Every house that located in housings which have security system one gate system has higher price worth Rp25, 692,396.43 than others which do not have one gate system for their security system (no change at other attributes). It probably because of exclusivity factor given by one gate system [13] do not really important for middle class houses owners in East Surabaya.

- f) Every house that located in housings which have public green space has higher price worth Rp62,574,530.55 than others which do not have public green space (no change at other attributes). It probably because the public green space can be used as garden and park for little children. As known that most of the respondents in this research are young family (51%) which have age span 26-35 years old. It is possible that majority of them have children already.
- g) Every 1 m additional width of road in front of house adds Rp10,623,871.19 of housing price. Conversely, every 1 m road width less reduces Rp10,623,871.19 of housing price (no change at other attributes). It probably because of easy access needed for transportation or vehicle access. Based on the observation, most of the respondents have cars.
- h) The houses are cheaper worth Rp12,688,478.63 than others for every 1 km further away to CBD. Conversely, the houses are more expensive worth Rp12,688,478.63 than others every 1 km nearer to CBD (no change at other attributes). It is because the further distance to CBD, the more cost and longer time needed. Conversely, the nearer distance to CBD, the less cost and time needed.
- i) The houses are cheaper worth Rp29,580,865.78 than others for every 1 km further away to education facilities. Conversely, the houses are more expensive worth Rp29,580,865.78 than others every 1 km nearer to education facilities (no change at other attributes). It probably influenced by traffic jam that happens frequently at going-to-school time and go-home time, the probability of lower quality, and bad student's attitudes of some education facilities in East Surabaya.

## 5. CONCLUSION AND DISCUSSION

This research shows that nine housing attributes, they are building width, lot width, amount of rooms, and amount of bathrooms, availability of one-gate system as security system, availability of public green space, road width in housing, distance from home to CBD, and distance from home to education facilities, have influence on the price of middle class housing in East Surabaya either simultaneously or partially.

Partially, those attributes are divided into two groups based on the significance of the influence on the housing price, they are the attributes which have significant influences and which do not. The significantly influential attributes are building width, amount of rooms, and amount of bathrooms, availability of public green space, road width in housing, distance from home to CBD, and distance from home to education facilities. While the insignificantly influential attributes are lot width and availability of one-gate system as security system.

The nine attributes are divided into two groups based on characteristics of their influences on the housing price, that is positive influence and negative influence. Positively influential attributes are building width, amount of rooms, and amount of bathrooms, availability of one-gate system as security system, availability of public green space, road width in housing, and distance from home to education facilities. And negatively influential attributes are lot width and distance from home to CBD.

All house attributes stated in this research have different level of influences toward housing price. It is because difference of conditions, needs, preferences, and priority of customers on the housing attributes. Beside differences, there are also similarities between the housing attributes. It has been found that implicit price [4] in each housing attribute is constant, whereby every change of value of housing attributes will affect the housing price constantly according to the implicit price of the housing attributes (in condition when an attribute change, the others do not).

In future, it needs a further study to analyze the influences of attributes distance from home to education facilities and lot width toward housing price. It is found in this research that those attributes have different influences toward housing price compared to previous researches or experts' opinion. Generally, the nearer distance from house to the education facilities, the higher price of the house. However, this research shows that the nearer house to the education facilities, the lower price of the house. Lot width attributes shows similar case. Generally, larger lot causes higher price of house. Otherwise, this research shows larger lot causes lower price of house although it is not significant. This may indicate that the two attributes are conditional. Their influence toward housing price depend on the condition and research setting characteristics.



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