

IMPROVED CONSUMER PREFERENCES ATTRIBUTES ANALYSIS FOR HOUSING PRODUCT PRICE IN INDONESIA

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Abstract: Residential study has always becomes interesting topic for research, as residential products do have unique characteristics that differentiate them from other commercial products. This research main objective is to analyze the consumer preference attributes, influencing price of housing product in Jakarta Metropolitan Region, Indonesia.

Two hundred and seventy seven respondents were questioned, using a model constructed from the author's previous studies. The data are gathered from five locations in Jakarta Metropolitan Region: South, North, West, East, and Central. Descriptive analysis, correlation analysis, structured equation modeling (SEM) analysis, and factor analysis were used to analyze the data in constructing conclusions for this study.

Based on the previous model, after data collection and analysis, we uncover new category for attributes influencing housing products price in Jakarta Metropolitan Region. There are positive correlations between each of the attributes. Significant values are also found in the demographic analysis and structural equation modeling (SEM) analysis in this study.

In conclusions, the results of this study shows reliable and valid proofs on how housing products price in Jakarta Metropolitan Region is affected by several categories and attributes, viewed from consumers' point of view.

This research is among the first to analyze consumer preference attributes and categories for housing product in Indonesia. The study also intended to be the pioneer in studies for preference attributes on housing price in Indonesia.

Keywords: Consumer behaviors, housing, pricing, property, residential homes, real estate

1. INTRODUCTION

Housing always becomes an interesting subject for discussion and research for scholars. The study of housing is interesting because it involves multi-

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dimensional issues. From economic study point of view, the discussion about how supply and demand of housing products in relation with the increasing number of population in the world is always interesting. From marketing study point of view, the debate on how property developer can increase the value of a housing product that they sell is also fascinating, as marketing treatment for one housing development compared with another housing development is different. From consumer behavior study point of view, it is intriguing to understand the process and the reasoning on how housing consumer selects a housing product to live in.

Questions have started to arise based on those three dimension point of views alone; such as how one housing product can be valued by a consumer and when the consumer chooses to purchase a housing product?

This study attempts to address such questions. As part of a dissertation study with final goal of creating a financial model for housing products in Jakarta Metropolitan Region, this research paper is set as a continuation study by the authors to follow up the previous qualitative research results on attributes influencing housing product price in Jakarta Metropolitan Region.

Indonesia as the fifth largest country in the world is selected for this study, with Jakarta Metropolitan Region as the capital of Indonesia and one of the largest cities in the world is selected as the population base for this study.

It is expected that the result from this study can be used as a base for the next research on housing consumer preference and housing product pricing model in Indonesia. As studies in the property industry in Indonesia are still scarce, it is hopeful that the findings in this research will enhance the vocabulary of literature within the industry.

2. LITERATURE REVIEW

Jakarta Metropolitan Region is the capital city of Indonesia with the land size up to 65.000 Ha. In the past years it has developed into a Metropolitan City. Jakarta has a unique position in the country, as unlike other major cities around the world, it serves as the center of government and business for Indonesia. This unique position has put the city as the main attraction point for business, work, and urbanization for people from all over Indonesia. As Jakarta does not have the capabilities to support the exponential growth of urbanization, the surrounding areas such as Cibubur, Bogor, Depok, Bekasi, and Serpong have become the extension and satellite cities to support Jakarta (Hudalah and Firman, 2012).

According to the Jakarta Metropolitan Region Central Bureau Statistics (BPS Provinsi DKI Jakarta, 2014) currently there are around 10 million people living in Jakarta Metropolitan Region, with 5.06 million people working in Jakarta Metropolitan Region per August 2014. During the weekdays, the number of people

working and commuting to and from Jakarta can reach up to 12 million people. The same report also stated that the current density of the people per square kilometer in the Jakarta Metropolitan Region reached the number of 14.469 in 2010 (BPS Provinsi DKI Jakarta, 2014), and Jakarta is ranked within the ten of the largest metro areas by population (Brooking Institution, 2001).

This massive population creates housing problem in the area as well as opening opportunities for real estate developers to gain profit over the price of housing with its increasing value over time. The increasing population and limited supply have amplified the housing price significantly. As real estate product is considered as a unique product (Hai-Zhen *et al.*, 2005), it is difficult to put a certain price tag for the product. With the lack of control and government policies, the price of housing is growing uncontrollably.

This turn of event obviously has weakened the position of housing consumers. With high product price and unclear information about the important aspects building the price of housing products in Jakarta Metropolitan Region, the consumers are left in the dark on the real price position for the product they intended to purchase.

This research study aims to bridge this gap of knowledge. By understanding the aspects building the price for housing products in Jakarta Metropolitan Region, we can determine and map the important preference attributes influencing the housing price. These findings at the end can be used to construct conceptual pricing model for housing product in the city.

There have been several previous studies conducted in the past to understand about the preference factors influencing housing price. Blakely and Synder (1998) stated that there are three major factors that contribute to purchasing decision of a certain housing products. The factors are lifestyle, prestige, and security. Several other studies concerning consumer preference to purchase a housing product follows after this study. Examples include studies made by Smersh & Smith (2000) on accessibility; Kwanda *et al.* (2001) on infrastructure, rooftop design and product quality; Berry *et al.* (2001) on service quality; Tu & Wong (2002) on economic condition; Molin & Timmermans (2003) on accessibility; Tjahjono (2004) on floor plan design; Edelstein & Lum (2004) and Glaeser *et al.* (2005) on economic background; Jiang & Rosenbloom (2005) on after-sales service; Spetic *et al.* (2005) and Jim & Chen (2006) on green concept; Eves (2006) on planned development; Hoffman *et al.* (2006) on type variations; Bina *et al.* (2006) distance to workplace; Susilowati & Virojanapa (2007) on green concept; Mulder (2007) on housing distance to family members; Pompe (2008) and LeGoix & Webster (2008) on gated community development concept; Feng & Humpreys (2008) on premium facilities; Vadali (2008) on direct toll road access; Gibbons & Machin (2008) on distance to activity center; Goodhart & Hofmann (2008) on financial condition; Jim & Chen

(2009) on location uniqueness; Davison *et al.* (2009) and Shafei *et al.* (2010) on brand; Akalin *et al.* (2009) on physical qualities; Fisher *et al.* (2009) on security condition; Sanders & Polasky (2009) and Singh *et al.* (2010) on quality of life; Tang & Yiu (2010) on development scale; Munusamy *et al.* (2010) on service quality; Favara & Imbs (2010) on financial condition; Riccardo *et al.* (2010) & Hofman *et al.* (2010) on physical qualities; Choudhary *et al.* (2011) on after-sales service; Hapsariniaty *et al.* (2013) on grand cluster development concept; Epple *et al.* (2013) on product quality; Xie *et al.* (2013), Aulia and Ismail (2013); Leung *et al.* (2013) and Arimurthy and Manaf (2013) on floor plan design; Brandt *et al.* (2013) and Wen *et al.* (2014) on distance to activity center; Cetintahra & Cubukcu (2014) on physical qualities, Famuyiwa & Babawale (2014) on infrastructure.

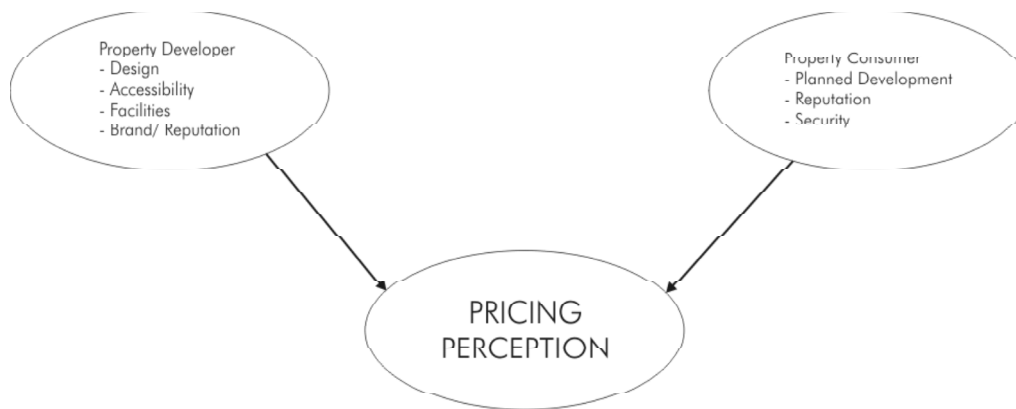


Figure 1: Synthesis of literature studies on housing consumer preference (Rahadi *et al.*, 2012)

Based on the literature study synthesis on housing consumer preference (Rahadi *et al.*, 2012), price perception can be viewed from both property developer and consumer standpoint. From perception of property developer, there are four main attributes affecting housing price: brand, accessibility, design and facility condition. From consumer perception, there are three main attributes affecting housing price: gated concept, prestige, and security.

Continuing the study (Rahadi *et al.*, 2013), a qualitative research was initiated. Seven respondents familiar with property industry were interviewed. The findings suggested that the initial theoretical model based on literature studies as seen in Figure 1 should be modified to conform to the Indonesian cultural context. The result of the study produces six categories and forty-five attributes which influence housing price in Jakarta Metropolitan Region and these categories are presented in Figure 2.

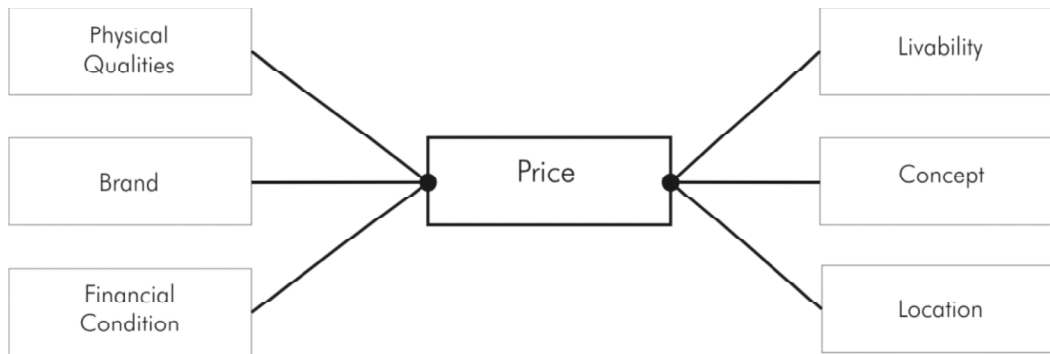


Figure 2: Consumer preference categories for housing price (Rahadi *et al.*, 2013)

The model stated in Figure 2 then will be used as a base for this research paper. The result of this study is expected to provide a unique consumer preference model for housing preference product in Jakarta Metropolitan Region.

3. MATERIALS AND METHODS

3.1. Research Method

The process in this study is divided into four stages. The first stage is synthesis of literature studies to create a baseline for interview questions. The next stage is interview process. Seven property industry representatives were interviewed to give their views concerning the objectives of this study. The result then adopted into questionnaires for the third stage. Two hundred and seventy-seven respondents consisting of housing consumers from Jakarta Metropolitan Region were questioned. Finally, the result from questionnaire used in data collection process is analyzed for discussion.



Figure 3: Research method stages

The literature study synthesis has been presented in a research paper (Rahadi *et al.*, 2012). The qualitative research result in the second stage has been presented in a research paper (Rahadi *et al.*, 2013). This research will cover the third and fourth stages: quantitative research study and the analysis stages.

3.2. Demographic Information

For this research, we collected sample data from some areas around Jakarta Metropolitan Region. The areas consisted of the main city of Jakarta, and its supporting satellite cities such as Serpong, Depok, Cibubur, and other areas. Those areas are not part of administrative divisions of Jakarta city, but they support the economic and business activities in the city of Jakarta (Firman, 2012). For this research, we divided the demographic location of the study in five different areas: Western, Eastern, Northern, Central, and Southern side of Jakarta. A total of two hundred and seventy-seven respondents were interviewed. 130 of them are female with the rest is male. Age range is between 18-56 years old. The research was conducted from July 2013 – July 2014.

We briefed the respondents prior to the data collection process. We provided them with questionnaire instructions, purpose of the study explanations, and data confidentiality briefing. All of the respondents prior to answering the questions provided their consents. All of the data gathering process, starting from the survey design, distribution, data collection, and data analysis were monitored and approved by the authors' advisor.

In Table 1, we can see the demographic information for this research, such as the following:

Table 1
Demographic Variables (N=277)

	<i>Item</i>	<i>Frequency</i>	<i>Per cent</i>
Sex	Female	130	46.9%
	Male	147	53.1%
Location	Central	16	5.8%
	East	51	18.4%
	North	31	11.2%
	South	114	41.2%
	West	65	23.5%

3.3. Reliability Analysis

The research of Rahadi et al. (2013) is used as the benchmark for this research questionnaire construction. The previous research will provide continuation for the overall research process. Based on the research results we extracted forty-five question items. The Cronbach's α score for the questions based on standardized items was 0.956 which is reliable and can be further reviewed (Gliem and Gliem, 2003).

3.4. Questionnaires

We collected information about consumers housing preferences by data collection through questionnaire. The questionnaire itself consisted of six categories

which are divided into forty-five individual questions. The question items were grouped into six categories: *lifestyle, physical qualities, brand, concept, financial condition* and *location*. For the question items we assigned a Likert scale of 1-6, with scale of 1 suggested the respondents' disagreement over the attribute ability to influence housing price, and scale of 6 suggested the respondents' agreement over the attribute ability to influence housing price in Jakarta Metropolitan Region. The detailed questionnaire items can be seen in Table 2.

Table 2
Questionnaire items for housing preferences (N=45)

Physical Qualities	Livability	Brand
1 Façade	1 Prestige	1 Developer's Commitment
2 Infrastructure	2 Social Status	2 Quality
3 ROW	3 Lifestyle	3 After-Sales Service
4 Rooftop Design	4 Privacy	4 Reputation
5 Product Specification	5 Complete Fixture	5 Overall Brand
6 Floor Plan Layout	6 Similar Age & Background	
7 Overall Physical Qualities	7 Overall Livability	
Location	Concept	Financial Condition
1 Direct Toll Road Access	1 Green Concept	1 Alternative Payment Scheme
2 Location Near Family	2 Development Scale	2 Reinvestment Value
3 Location Near Workplace	3 Theme & Story	3 Economic Background
4 Good Security System	4 Following Trends	4 Pricing Scheme
5 Good Social Communication	5 Grand Cluster	5 Overall Financial Condition
6 Ease of Accessibility	6 Premium Facilities	
7 Location Near Activity Center	7 Cluster Concept	
8 Location Near Shopping Center	8 Type Variations	
9 Location Near Education Center	9 Overall Concept	
10 Location Near Religious Center		
11 Unique Location		
12 Overall Location		

3.5. Statistical Analysis

Maximum likelihood factor analysis was used to identify the questionnaire categories. In addition to factor analysis, we also measured the internal consistency of the questionnaire scales and categories. We also conducted partial correlation analysis by controlling the location, age, income preference and gender. This was done to determine whether the scale represents the relationship between price and consumer preference attributes. For statistical analysis, we used SPSS, AMOS and JMP statistical software.

4. RESULTS

4.1. Descriptive Analysis

Descriptive analysis in this paper will be represented by frequency and mean analysis of the questionnaires.

4.1.1. Frequencies Analysis Results

As seen in Figure 4, the respondents' responses for *physical qualities*, *financial condition*, and *livability* categories are distributed evenly, with *agreed* answers dominated most of the questionnaires. For *concept* category, there are two attributes that presents different frequencies, with *following trends* attribute dominated with *disagree* answer, and *green concept* are dominated with *very strongly agree* answer.

For *location* attribute, there are tendencies for positive (agree) answers. The evidence can be seen on *very strongly agree* answers for most of the attributes. The only two exceptions are the *locations near family* attribute response dominated with *agree* answer, and the *locations near workplace* attribute response dominated with *very agree* answer. Lastly, for brand category, the answers are divided into *agree* and *strongly agree* answers on the attributes.

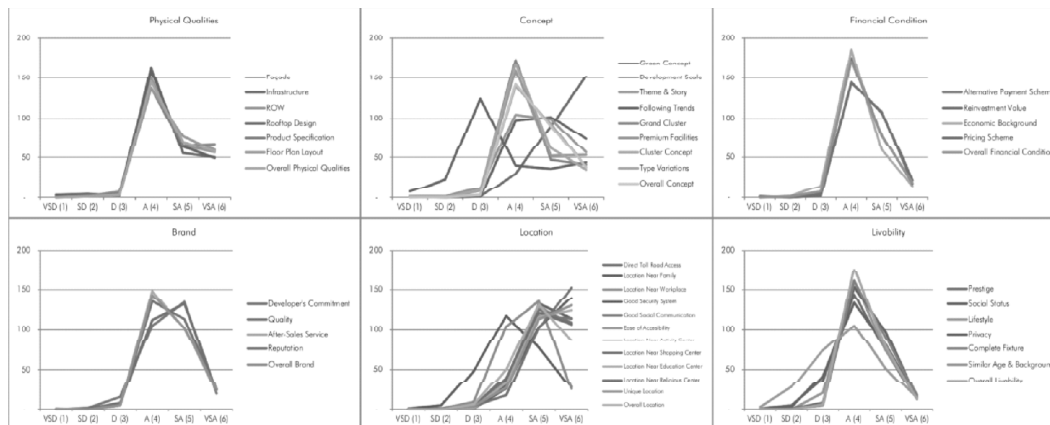


Figure 4: Frequency analysis for housing consumer preference categories

4.1.2. Mean Analysis Results

Based on the result seen in Figure 5, the categories of *physical qualities*, *brand*, and *financial condition*, all have an almost linear response, with mean averaged around 4.5 (response are between *agree* and *strongly agree*). For *concept* category, there are discrepancies on the *green concept* and *following trends* attributes. For *location* category, there are discrepancies on the *location near family* and *location near workplace* attributes. Finally for *livability* category, there is a discrepancy on the *similar age and background* attribute.

Comparing mean from each of the attributes, the overall result suggested that all of the responses has positive answers. The highest score achieved by the attributes of *location near religious center*, *green concept*, *good security system*, *unique location*, *location near education center*, and *direct toll road access* with mean scores above 5.3. The lowest score conceived by the attributes of *following trends* and *similar age and background* with mean scores below 4.

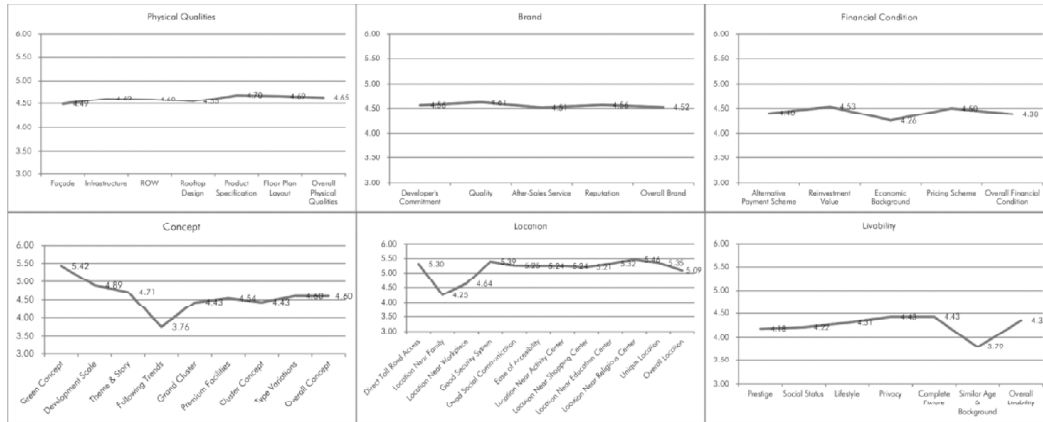


Figure 5: Mean analysis for housing consumer preference categories.



Figure 6: Mean analysis for housing consumer preference influencing attributes

4.2. Wilcoxon Test Analysis Results

From the findings, the result suggested that a consumer who chose to purchase his/her residential product in central of Jakarta has a higher preference towards price for the entire category of *location*. The consumer in central of Jakarta also has a higher preference towards price for the entire category of *concept*, except for the attributes of *green concept* and *overall concept*.

For the *financial condition* category, the *alternative payment scheme* attribute produces significant preference for Central Jakarta consumer, compared with other locations. For the *livability* category attribute of *similar age & background* and *overall livability*, the Central Jakarta consumer has a higher preference score towards price compared with the consumer from other locations.

From gender perspective, as seen in Table 3 above, the result shows that for the entire category of *brand*, *financial condition*, and *livability*, the female gender has

Table 3
Wilcoxon test result of housing preferences based on gender

Item	Female > Male			Central has higher preferences		
	Prob > Chi-Square	Analysis	Preferences	Prob > Chi-Square	Analysis	Preferences
Facade	0.00	Significant	Female > Male	0.00	Significant	Central has higher preferences
Infrastructure	0.00	Significant	Female > Male	0.00	Significant	Central has higher preferences
ROW	0.00	Significant	Female > Male	0.00	Significant	Central has higher preferences
Rooftop Design	0.00	Significant	Female > Male	0.00	Significant	Central has higher preferences
Product Specification	0.00	Significant	Female > Male	0.00	Significant	Central has higher preferences
Floor Plan Layout	0.00	Significant	Female > Male	0.00	Significant	Central has higher preferences
Overall Physical Qualities	0.00	Significant	Female > Male	0.00	Significant	Central has higher preferences
Developer's Commitment	0.00	Significant	Female > Male	0.08	Not Significant	Similar
Quality	0.00	Significant	Female > Male	0.32	Not Significant	Similar
After-Sales Service	0.00	Significant	Female > Male	0.14	Not Significant	Similar
Reputation	0.00	Significant	Female > Male	0.21	Not Significant	Similar
Overall Brand	0.00	Significant	Female > Male	0.05	Not Significant	Similar
Green Concept	0.05	Not Significant	Similar	0.60	Not Significant	Similar
Development Scale	0.00	Significant	Female > Male	0.00	Significant	Central has higher preferences
Theme & Story	0.00	Significant	Female > Male	0.00	Significant	Central has higher preferences
Following Trends	0.00	Significant	Female > Male	0.00	Significant	Central has higher preferences
Grand Cluster	0.00	Significant	Female > Male	0.00	Significant	Central has higher preferences
Premium Facilities	0.00	Significant	Female > Male	0.00	Significant	Central has higher preferences
Cluster Concept	0.00	Significant	Female > Male	0.00	Significant	Central has higher preferences
Type Variations	0.00	Significant	Female > Male	0.00	Significant	Central has higher preferences
Overall Concept	0.00	Significant	Female > Male	0.01	Not Significant	Similar
Direct Toll Road Access	0.37	Not Significant	Similar	0.11	Not Significant	Similar
Located Near Family	0.00	Significant	Female > Male	0.13	Not Significant	Similar
Located Near Workplace	0.00	Significant	Female > Male	0.01	Not Significant	Similar
Good Security System	0.50	Not Significant	Similar	0.41	Not Significant	Similar
Good Social Communication	0.39	Not Significant	Similar	0.06	Not Significant	Similar
Ease of Accessibility	0.98	Not Significant	Similar	0.29	Not Significant	Similar
Located Near Activity Center	0.66	Not Significant	Similar	0.18	Not Significant	Similar
Located Near Shopping Center	0.55	Not Significant	Similar	0.06	Not Significant	Similar
Located Near Education Center	0.45	Not Significant	Similar	0.17	Not Significant	Similar
Located Near Religious Center	0.05	Not Significant	Similar	0.69	Not Significant	Similar
Unique Location	0.12	Not Significant	Similar	0.69	Not Significant	Similar
Overall Location	0.15	Not Significant	Similar	0.10	Not Significant	Similar
Alternative Payment Scheme	0.00	Significant	Female > Male	0.00	Significant	Central has higher preferences
Reinvestment Value	0.00	Significant	Female > Male	0.07	Not Significant	Similar
Economic Background	0.00	Significant	Female > Male	0.02	Not Significant	Similar
Pricing Scheme	0.00	Significant	Female > Male	0.26	Not Significant	Similar
Overall Financial Condition	0.00	Significant	Female > Male	0.08	Not Significant	Similar
Prestige	0.00	Significant	Female > Male	0.01	Not Significant	Similar
Social Status	0.00	Significant	Female > Male	0.02	Not Significant	Similar
Lifestyle	0.00	Significant	Female > Male	0.13	Not Significant	Similar
Privacy	0.00	Significant	Female > Male	0.01	Not Significant	Similar
Complete Fixture	0.00	Significant	Female > Male	0.00	Significant	Similar
Similar Age & Background	0.00	Significant	Female > Male	0.10	Not Significant	Central has higher preferences
Overall Livability	0.00	Significant	Female > Male	0.03	Not Significant	Central has higher preferences

a higher preference towards price compared with the male gender. For most of the attributes in *concept* category except the *green concept* and the attributes of *location near family* and *location near workplace*, the female gender has a higher preference level towards price compared with their male counterparts.

4.3. Correlation Analysis Results

After analyzing the questionnaire results, the findings suggested positive correlation between each attribute. In particular the correlation between attribute of *infrastructure* from *physical quality* category and attribute of *premium facilities* produces high correlation value of 0.619.

From within the same category, there are several attributes that correlates highly between them, recording numbers above 0.60, as seen in Table 4.

Table 4
Correlation value between attributes of housing preferences in their respective categories (value > 0.60)

Physical Qualities	Concept	Brand
Façade & Infrastructure	Development Scale & Theme and Story*	Developer's Commitment & Quality
Façade & ROW	Development Scale & Cluster Concept	Quality & After-Sales Service
Façade & Rooftop Design	Theme and Story & Premium Facilities	Quality & Reputation
Façade & Product Specification	Theme and Story & Cluster Concept	Quality & Overall Brand
Façade & Floor Plan Layout	Following Trends & Grand Cluster	After-Sales Service & Reputation*
Façade & Overall Physical Qualities	Following Trends & Premium Facilities	After-Sales Service & Overall Brand
Infrastructure & ROW*	Following Trends & Cluster Concept	Reputation & Overall Brand
Infrastructure & Rooftop Design	Grand Cluster & Premium Facilities	
Infrastructure & Product Specification	Grand Cluster & Cluster Concept	
Infrastructure & Floor Plan Layout	Grand Cluster & Type Variations	
Infrastructure & Overall Physical Qualities	Premium Facilities & Cluster Concept	
ROW & Rooftop Design	Premium Facilities & Type Variations	
ROW & Product Specification	Cluster Concept & Type Variations	
ROW & Floor Plan Layout		
ROW & Overall Physical Qualities		
Rooftop Design & Product Specification		
Rooftop Design & Floor Plan Layout		
Rooftop Design & Overall Physical Qualities		
Product Specification & Floor Plan Layout		
Product Specification & Overall Physical Qualities		
Floor Plan Layout & Overall Physical Qualities		
Location	Livability	Financial Condition
Direct Toll Road Access & Good Security System	Prestige & Social Status*	Alternative Payment Scheme & Reinvestment Value
Direct Toll Road Access & Good Social Communication	Prestige & Lifestyle	Alternative Payment Scheme & Economic Background
Direct Toll Road Access & Ease of Accessibility	Prestige & Privacy	Alternative Payment Scheme & Overall Financial Condition
Direct Toll Road Access & Location Near Activity Center	Prestige & Complete Fixture	Reinvestment Value & Overall Financial Condition
Direct Toll Road Access & Location Near Education Center	Social Status & Lifestyle	Economic Background & Pricing Scheme
Location Near Workplace & Location Near Education Center	Social Status & Privacy	Economic Background & Overall Financial Condition*
Good Security System & Good Social Communication	Social Status & Complete Fixture	Pricing Scheme & Overall Financial Condition
Good Security System & Ease of Accessibility	Social Status & Overall Livability	
Good Security System & Location Near Activity Center	Lifestyle & Privacy	
Good Security System & Location Near Shopping Center	Lifestyle & Complete Fixture	
Good Security System & Location Near Education Center	Lifestyle & Overall Livability	
Good Social Communication & Ease of Accessibility	Privacy & Complete Fixture	
Good Social Communication & Location Near Activity Center	Privacy & Overall Livability	
Good Social Communication & Location Near Education Center	Complete Fixture & Overall Livability	
Ease of Accessibility & Location Near Activity Center*		
Ease of Accessibility & Location Near Shopping Center		
Ease of Accessibility & Location Near Education Center		
Location Near Activity Center & Location Near Shopping Center		
Location Near Activity Center & Location Near Education Center		
Location Near Shopping Center & Location Near Education Center		

*) means has the highest value among attributes in the category

4.4. Structured Equation Modeling

Structured equation modeling (SEM) is a statistical tool to calculate assumption of relationship between attributes in theoretical model, either directly or indirectly or via interfering and mediating attributes. SEM has the advantage to provide explanation on direct and indirect correlations between each of the attributes. Below is the layout of theoretical model for this research paper.

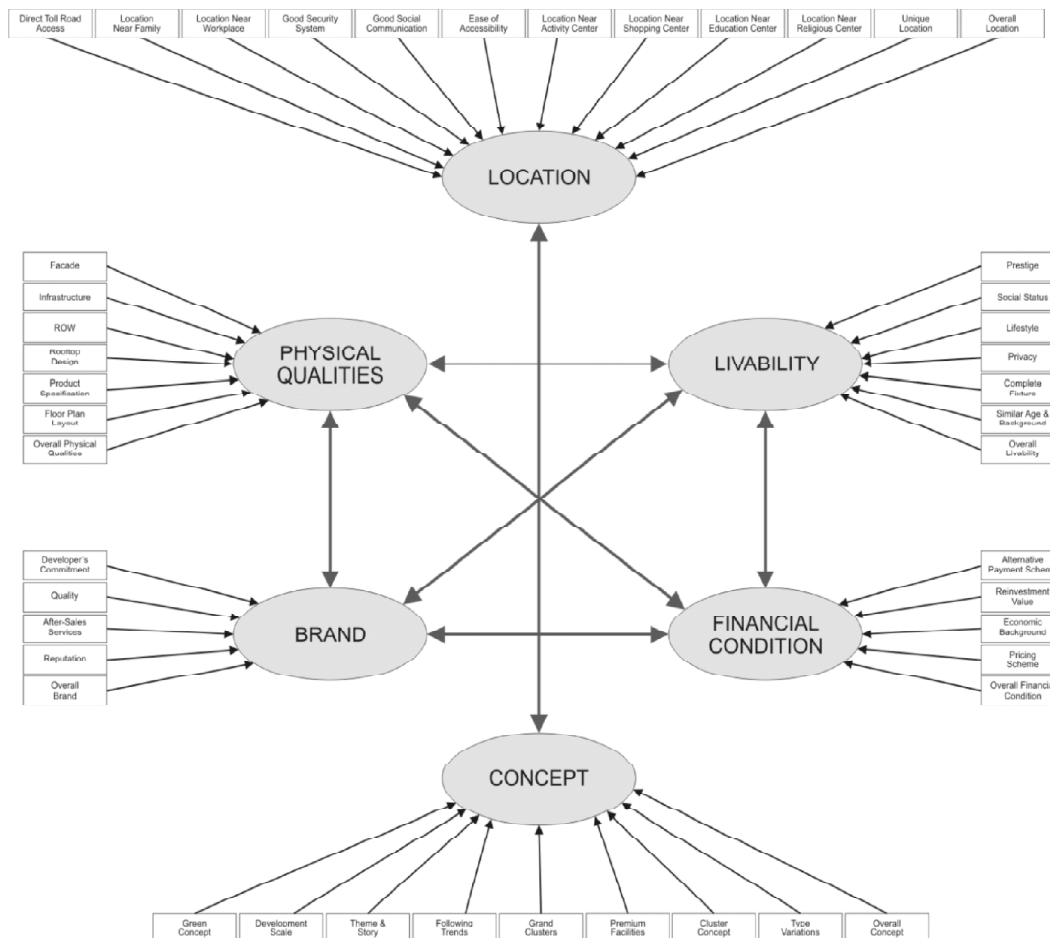


Figure 7: Path diagram for structured equation modeling

Based on the structured equation modeling path diagram in figure 7, using SPSS-AMOS, we can analyze the standardized regression weight, correlation between categories, and squared multiple correlations between each of the attributes and the categories.

4.4.1. Standardized Regression Weight Analysis Results

For location categories, most of the attributes showed a good relationship with main category. Only three attributes: *location near religious center*, *unique location*, and *overall location* has a low relationship score. For other categories, most of the attributes are showing good relationship with each of their categories.

Table 5
Standardized regression weights analysis results for the attributes

No.	Item Relation	Estimate	No.	Item Relation	Estimate
1	Direct Toll Road Access <--- Location	0.77	25	Façade <--- Physical Quality	0.82
2	Location Near Family <--- Location	0.46	26	Infrastructure <--- Physical Quality	0.88
3	Location Near Workplace <--- Location	0.69	27	ROW <--- Physical Quality	0.88
4	Good Security System <--- Location	0.85	28	Rooftop Design <--- Physical Quality	0.95
5	Good Social Communication <--- Location	0.78	29	Product Specification <--- Physical Quality	0.85
6	Ease of Accessibility <--- Location	0.85	30	Floor Plan Layout <--- Physical Quality	0.87
7	Location Near Activity Center <--- Location	0.87	31	Overall Physical Qualities <--- Physical Quality	0.82
8	Location Near Shopping Center <--- Location	0.81	32	Developer's Commitment <--- Brand	0.64
9	Location Near Education Center <--- Location	0.86	33	Quality <--- Brand	0.79
10	Location Near Religious Center <--- Location	0.39	34	After-Sales Service <--- Brand	0.86
11	Unique Location <--- Location	0.34	35	Reputation <--- Brand	0.85
12	Overall Location <--- Location	0.31	36	Overall Brand <--- Brand	0.77
13	Alternative Payment Scheme <--- Financial Condition	0.76	37	Green Concept <--- Concept	0.49
14	Reinvestment Value <--- Financial Condition	0.75	38	Development Scale <--- Concept	0.75
15	Economic Background <--- Financial Condition	0.83	39	Theme & Story <--- Concept	0.73
16	Pricing Scheme <--- Financial Condition	0.75	40	Following Trends <--- Concept	0.71
17	Overall Financial Condition <--- Financial Condition	0.87	41	Grand Cluster <--- Concept	0.84
18	Prestige <--- Livability	0.88	42	Premium Facilities <--- Concept	0.88
19	Social Status <--- Livability	0.90	43	Cluster Concept <--- Concept	0.90
20	Lifestyle <--- Livability	0.86	44	Type Variations <--- Concept	0.80
21	Privacy <--- Livability	0.81	45	Overall Concept <--- Concept	0.61
22	Complete Fixture <--- Livability	0.77			
23	Similar Age & Background <--- Livability	0.60			
24	Overall Livability <--- Livability	0.73			

4.4.2. Correlation between Categories Analysis Results

Table 6
Correlation between categories analysis results

No.	Correlation	Estimate
1	Physical Quality <--> Brand	0.68
2	Brand <--> Concept	0.66
3	Physical Quality <--> Location	0.18
4	Brand <--> Location	0.18
5	Concept <--> Financial Condition	0.62
6	Brand <--> Financial Condition	0.68
7	Location <--> Financial Condition	0.20
8	Physical Quality <--> Financial Condition	0.68
9	Concept <--> Location	0.34
10	Concept <--> Livability	0.55
11	Financial Condition <--> Livability	0.56
12	Location <--> Livability	0.22
13	Physical Quality <--> Livability	0.58
14	Brand <--> Livability	0.54
15	Physical Quality <--> Concept	0.70

All of the categories have positive correlations. However, not all of them have strong positive correlation, with score above 0.5. Notably, the *location* category does not correlate well with the rest of the categories, with all of their correlation scores below 0.35.

4.4.3. Squared Multiple Correlations Analysis Results

Table 7
Squared multiple correlations for each of the attributes

No.	Attributes	Estimate	Variations	Unique Factors	No.	Attributes	Estimate	Variations	Unique Factors
1	Prestige	0.78	78%	23%	25	Green Concept	0.24	24%	76%
2	Social Status	0.81	81%	19%	26	Development Scale	0.56	56%	44%
3	Lifestyle	0.73	73%	27%	27	Theme & Story	0.54	54%	46%
4	Privacy	0.66	66%	34%	28	Following Trends	0.51	51%	50%
5	Complete Fixture	0.59	59%	41%	29	Grand Cluster	0.71	71%	29%
6	Similar Age & Background	0.36	36%	64%	30	Premium Facilities	0.77	77%	23%
7	Overall Livability	0.54	54%	46%	31	Cluster Concept	0.81	81%	19%
8	Alternative Payment Scheme	0.58	58%	42%	32	Type Variations	0.63	63%	37%
9	Reinvestment Value	0.57	57%	43%	33	Overall Concept	0.38	38%	62%
10	Economic Background	0.69	69%	31%	34	Developer's Commitment	0.41	41%	59%
11	Pricing Scheme	0.56	56%	44%	35	Quality	0.63	63%	38%
12	Overall Financial Condition	0.76	76%	25%	36	After-Sales Service	0.75	75%	26%
13	Direct Toll Road Access	0.59	59%	41%	37	Reputation	0.71	71%	29%
14	Location Near Family	0.21	21%	79%	38	Overall Brand	0.59	59%	41%
15	Location Near Workplace	0.47	47%	53%	39	Facade	0.67	67%	33%
16	Good Security System	0.73	73%	27%	40	Infrastructure	0.77	77%	23%
17	Good Social Communication	0.61	61%	39%	41	ROW	0.78	78%	22%
18	Ease of Accessibility	0.73	73%	27%	42	Rooflap Design	0.90	90%	11%
19	Location Near Activity Center	0.76	76%	25%	43	Product Specification	0.73	73%	27%
20	Location Near Shopping Center	0.64	64%	34%	44	Floor Plan Layout	0.77	77%	24%
21	Location Near Education Center	0.73	73%	27%	45	Overall Physical Qualities	0.67	67%	33%
22	Location Near Religious Center	0.16	16%	85%					
23	Unique Location	0.11	11%	89%					
24	Overall Location	0.09	9%	91%					

The table 7 presents the results of squared multiple correlations for each of the attributes. The higher the variation percentage means the attributes can be explained by the categories. The lower the variation percentage means the attributes do not present as viable indicators for the categories. As seen in the results, the lowest percentage of variations are obtained by the attributes of *overall location* with 9% variation, *unique location* with 11% variation, and *location near religious center* with 16% variation.

4.5. Factor Analysis Structure

After the factor analysis is calculated, Table 8 displays that the result produces new sets of category. We selected results that show Eigen value score on correlations that was higher than one. The categories after calculation produced a cumulative number of 70.822 percent.

Kaiser-Meyer-Olkin measurements of sample adequacy were calculated, and it produced a significant result of 0.936, with the Bartlett's test of sphericity also produced significant value of below 0.000.

Rotation of the attributing components produced a total of seven categories. The previous category of *physical qualities*, *concept*, *brand*, *financial condition*, and

Table 8
Eigenvalues results uncover the seven sets of categories

Component	Initial Eigenvalues			Extraction Sums of Squared			Rotation Sums of Squared		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	16.488	36.639	36.639	16.488	36.639	36.639	6.070	13.489	13.489
2	5.844	12.986	49.625	5.844	12.986	49.625	5.798	12.884	26.373
3	2.635	5.855	55.480	2.635	5.855	55.480	5.439	12.087	38.460
4	2.051	4.558	60.039	2.051	4.558	60.039	5.276	11.724	50.184
5	1.790	3.978	64.017	1.790	3.978	64.017	3.600	7.999	58.183
6	1.728	3.840	67.857	1.728	3.840	67.857	3.456	7.680	65.863
7	1.334	2.965	70.822	1.334	2.965	70.822	2.231	4.959	70.822
8	0.935	2.078	72.900						
9	0.899	1.999	74.899						
10	0.789	1.754	76.652						

Table 9
Rotation of the attributing components produces seven categories from the initial six categories

Question	Components						
	Location Accessibility	Physical Qualities	Livability	Concept	Financial Condition	Brand	Location Uniqueness
Facade		.725					
Infrastructure		.720					
ROW		.729					
Roof-top Design		.817					
Product Specification		.818					
Floor Plan Layout		.802					
Overall Physical Qualities		.754					
Developer's Commitment						.685	
Quality						.747	
After-Sales Service						.723	
Reputation						.704	
Overall Brand						.638	
Green Concept				.591			
Development Scale				.781			
Theme & Story				.724			
Following Trends				.560			
Grand Cluster				.678			
Premium Facilities				.689			
Cluster Concept				.750			
Type Variations				.696			
Overall Concept				.580			
Direct Toll Road Access	.792						
Located Near Family	.449						
Located Near Workplace	.693						
Good Security System	.855						
Good Social Communication	.803						
Ease of Accessibility	.858						
Located Near Activity Center	.871						
Located Near Shopping Center	.806						
Located Near Education Center	.846						
Located Near Religious Center							.765
Unique Location							.807
Overall Location							.641
Alternative Payment Scheme					.671		
Reinvestment Value					.618		
Economic Background					.704		
Pricing Scheme					.730		
Overall Financial Condition					.783		
Prestige			.815				
Social Status			.835				
Lifestyle			.836				
Privacy			.790				
Complete Fixture			.741				
Similar Age & Background			.577				
Overall Livability			.741				

livability remain the same, while the *location* category is divided into two new categories. The new categories were named as *location accessibility* and *location uniqueness*. The location accessibility category consisted of the *direct toll road access, location near close relatives, location near working place, good security system, good social communication, ease of accessibility, location near activity center, location near shopping center, and location near education center*. The location uniqueness category consisted of *location near religious center, unique location, and overall location*.

Based on the Table 9, the arrangement of categories is revised from the initial six categories to seven categories. The Figure 8 explains the change, with location category is expanding into two new categories, namely category of *location accessibility* and *location uniqueness*.

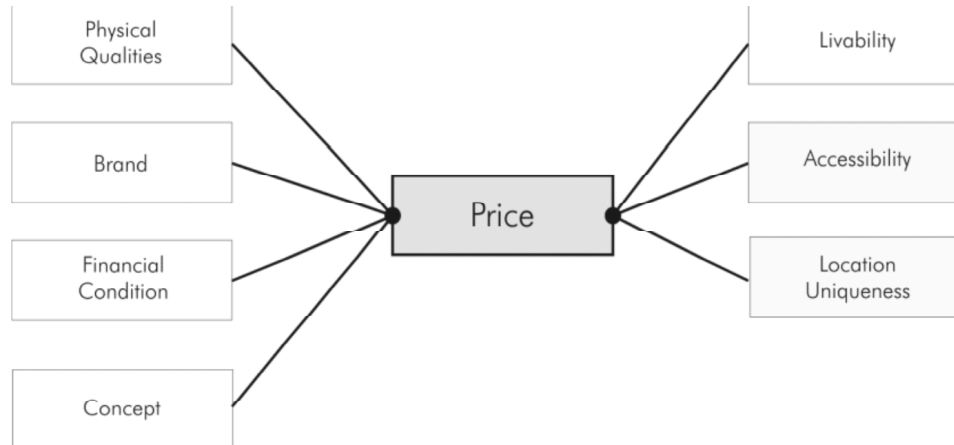


Figure 8: Consumer preference model for housing product price in Jakarta Metropolitan Region

5. DISCUSSION

Based on the frequency analysis, there are several interesting facts emerging from the findings. Most of the attributes presents positive answers. These positive answers are useful to prove the initial assumptions on attributes influencing housing price in Jakarta Metropolitan Region. The only exception is the answers on *following trends* attributes, which has higher frequency on *disagree* responses. As the attribute is derived from interview result with property developer key figures, there are different perception made by the developer and the consumer over the attributes influencing price of housing product in Jakarta Metropolitan Region. Large property developers for a while have used the *following trends* attribute as one of their marketing gimmick for sales in Indonesia. However, with this finding it is interesting to find that the perception of the consumers might

have shifted. A housing product with more individual touch or accent should be more interesting compared with housing product that is similar with their neighbors.

The findings on mean analysis show several revealing results. On the categories of *physical quality*, *brand*, and *financial conditions*, all provides linear responses. On the *concept* category the attribute *green concept* provides higher result compared with the other attributes. This shows that most of the respondents do appreciate green concept as an important attribute when they choose a housing product to live in. The attribute *following trends* provides lowest result in the category. The findings are in line with the frequency analysis result, which strengthen the need to provide personal touch on each of the housing products to be sold. On the location category, the *location near family* and *location near workplace* attributes scored lower result compared with the other attributes. The findings suggested that compared with the need to have a house located near family or workplace, it is more important to have a house located near activity center, educational center, and shopping center. Lastly on the livability category, the *similar age and background* attribute has the lowest value compared with the other attributes. This finding suggested that when purchasing a house, a consumer prefers to live in an environment that has neighborhood with rich demographics, economic, and cultural background.

Mean analysis from the whole attributes provides intriguing results. The highest value is presented by the attributes of *location near religious center*, *green concept*, *good security system*, *unique location*, *location near education center*, and *direct toll road access*. With location category dominating the result, it is safe to say that location is still considered as the most important factor in housing selection decision. All of the result also suggested that the concept of satellite city, that is common to find in Jakarta Metropolitan Region, with the development of BSD City, Grand Wisata, Kota Wisata, and other large development surrounding Jakarta, should pay attention to these attributes in order to please their consumers. Property developers should also pay attention to the *following trends* and *similar age and background* attributes when developing a new product. With the current development are still incorporating these attributes to their marketing and construction aspects, it is important that their future development do not make the same mistake, and create a product that is not suitable with consumer preferences.

From the findings on Wilcoxon tests, the result suggested that a consumer who chooses to purchase his/her residential product in central of Jakarta has a higher preference towards price for the entire category of *location*. As central of Jakarta is the place for business and activities, it is understandable that the requirements for location attributes is higher in this area, compared with the other residential locations around Jakarta Metropolitan Region. The consumer in central of Jakarta also has a higher preference towards price for the entire category of

concept, except for green concept and overall concept. This is rationalized with the current condition of Central Jakarta that is mainly developed for business activities. The introduction of good concept can increase the price preference of the consumer looking to purchase the products in that particular area.

For *financial condition* category, the alternative payment scheme attribute produces significant preference for Central Jakarta consumer, compared with other locations. For *livability* category attribute of similar background and overall livability, the Central Jakarta consumer has a higher preference score towards price compared with the consumer from other locations.

From gender point of perspective, the result showed that the female gender has a higher preference towards price compared with the male gender for the entire category of *brand*, *financial condition*, and *livability*. For most of the attributes in the *concept* category except the *green concept* and the attributes of *location near family and workplace*, the female gender has a higher preference level towards price compared with their male counterparts. This finding is consistent with the conclusion of several studies discussing on decision making process in families. Tracking back to literature on decision making within a household, there has been several studies analyzing the decision making process when it comes to purchasing goods within the household. The studies by Harry L. Davis (1976) for example, suggested the result of the dominance of housewives in families as the main decision maker when it comes to determining which goods are worth purchased. For housing choice, the determining decision maker in housing selection falls to the housewives of the families (Wilkening and Morrison, 1963; Munsinger et al., 1975).

For correlation, the attributes in each of the category are producing high correlation between them. Crossing the categories produces a positive correlation. However, only the attributes of *infrastructure* from *physical quality* category, and *premium facilities* from *concept* category that produce high correlation value.

Analyzing the data using Structured Equation Modeling (SEM) analysis, the structured regression weight analysis result shows that most of the attributes have good relationship with their main categories. The only exception is the attributes of *location near religious center*, *unique location*, and *overall location* which has low relationship score with their main category. The squared multiple correlations analysis results shows that the lowest percentage of variations are obtained by the attributes of *overall location* with 9% variation, *unique location* with 11% variation, and *location near religious center* with 16% variation. These findings are supporting the factor analysis results, which suggested that the *location* category should be divided into two new categories of accessibility and location uniqueness.

From the modified six to become seven categories of attributes influencing housing price, this study suggested that the *location accessibility* category attributes

are providing most of the positive answers, followed by the *livability* and *physical qualities* category.

Location plays an important role for consumer when deciding to purchase a residence. There are plenty of studies that have studied on the relationship between location and preference for dwellings, with most of them agreeing that location is the most influential attributes in housing selection decision. The next category worth mentioned is the livability category.

Livability category relates with how comfortable one house is for nurturing and developing a family. Some of the important attributes in livability category include the social status and prestige. These attributes are also related with location category. By living in a certain part of the city, social status and prestige level for dwellers can be elevated. Examples include the housing development in Pondok Indah or Menteng area in Jakarta, housing development in Chelsea area in London, or housing development in Beverly Hills area in Los Angeles.

Physical qualities category relates with the development of the housing infrastructure and design. Good design, clear layout, ground installation of power and telephone network, and excellent product specification are some of the attributes that can influence consumers to purchase a product with premium price. Other attributes on the other categories are also important. Concept, brand, and financial condition all have positive influence toward price of housing product as seen from consumer perspective.

6. CONCLUSION

This study is one of the few first studies to identify attributes preferences for housing products price, particularly in Indonesia. As such, this research results produce significant practical and theoretical implications for housing market, in particular for Jakarta Metropolitan Region and Indonesian context.

The main contribution of this study is the provisional guidance on categories and attributes influencing housing products price. There are seven dominating categories influencing housing products price, viewed from the housing consumers' point of perspective. The categories are: physical qualities, brand, concept, location, accessibility, financial condition, and livability.

The findings from this research can be useful for various parties in the property industry. For government, the result of this study can be used to create laws and regulations that can provide positive support for property industry in Indonesia. The consumer can use the result of this study to understand the reasoning behind price development for housing products. Property developer can interpret the result from this study to analyze their current pricing strategy, and use them accordingly to produce a significantly improved marketing and pricing model for their next projects.

7. FUTURE RESEARCH

As the studies concerning consumer preference for housing products in Indonesia are still rare, there are vast possibilities for expansion of the study. The consumer preference towards price characteristics in Jakarta Metropolitan Region might be different compared with consumer preference towards price characteristics in other cities in Indonesia. The application of a model in this research can be replicated and analyzed in other cities all around Indonesia. The purpose is to produce a whole consumer preference model for housing product development in Indonesia. After that, the expansion of this study in other cities in neighboring countries can be applied, as the surrounding countries come from the same cultural roots. Cross preferences might be expected as the result of this study expansion.

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