

# The Effect of Green Purchase Behavior and Housing Environment Preferences on Property Pricing Strategies

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**Abstract**—This research aims to examine the effect of green purchase behavior and housing environment preference on property pricing strategies. The type of research used in this study is verificative explanation research with the research method used is explanatory survey. The unit of analysis in this study is the property industry in West Java. The population in this study is 506 companies, samples taken for each city / district. West Java Province consists of 27 districts / cities, so there are 27 samples. PLS is used as a statistical test tool to test hypotheses. The results of this study indicate that the pricing strategy is influenced by green purchase behavior and the housing environment preference, where the dominant contribution is obtained from the housing environment rather than the contribution of green purchase behavior. The findings have implications for the management of residential property developers that the property pricing strategy must consider aspects of the housing environment preference and green purchase behavior. The strategy of determining property prices is mainly formulated by considering the aspects of community social capital, community facilities and mobility, accompanied by an understanding of Subjective norms, confidence in GPs, convenience levels, knowledge of GPs, and important of prices.

**Keywords**—green purchase behavior; housing environment preferences; pricing strategy

## I. INTRODUCTION

Indonesia's economic conditions which tend to increase over the last ten years (2006-2016) have resulted in an increase in population income (per capita income). The increase in residential property prices has increased annually.

In 2015, the backlog in Indonesia was around 13.5 million units. Historical data on home backlogs are as in table 1. In 2017, the Backlog number dropped to 11.4 million homes. Data from the Directorate General of Housing Provision at the Ministry of Public Works and Public Housing (PUPR) said that of the 11.4 million backlog figures, 20 percent of them belong to the ranks of commercial houses that do not require subsidies. Meanwhile, the other 20 percent belong to the lower group who need social assistance from the government because even though they have been given the ease of credit facilities, they still cannot afford to buy a house. Meanwhile, the remaining 60

percent are middle class people who need subsidy assistance. Provinces with the largest number of home ownership backlogs (over 1 million households) are West Java around 2.3 million households, DKI Jakarta around 1.3 million households, and North Sumatra around 1.03 million households, DKI Jakarta around 1.3 million households, and North Sumatra around 1.03 million households.

TABLE I. HOME BACKLOG IN INDONESIA 2010-2014

Year	House-hold Qty	Total House	Backlog (Inhabit)	Backlog (Owned)
2010	61.390.300	54.219.913	7.170.387	13.505.866
2011	62.255.258	54.442.223	7.813.035	13.216.791
2012	63.132.404	55.821.671	7.310.732	12.512.842
2013	64.021.907	56.233.821	7.788.086	13.144.695
2014	64.932.944	57.056.772	7.868.171	13.012.107

Source: Indonesian Ministry of Finance.

In 2017, sales in almost all developer companies experienced a decline or stagnation. This can be seen from the sales data of property companies that have gone public and listed on the Indonesia Stock Exchange. Most did not reach the target, a small percentage stagnated, only a few increased. The property industry in Indonesia is experiencing a cycle of ups and downs. Conditions when property is experiencing a boom or high property sales (seller's market) and the condition of a crash when property sales are sluggish (buyer's market) occurs in cycles for 4 (four) or 5 (five) years. From 2014 to the end of 2017, property prices have not experienced a recovery where residential property sales have also been sluggish amid property prices that tend to stagnate.

There are several factors that might be the cause of the gap as a matter of fact as mentioned above, where one of them is a strategy to determine the price of residential property that may not meet market demand. According Bonnici and Channon [1], pricing strategies are policies adopted by the company to determine how much it will cost for products and services produced by the company. According to Bressler and King [2],

determining the price of a commodity is the result of a balance between supply and demand in a single or multiple price market. Based on these opinions, the conditions presented above illustrate the phenomenon of imbalances in pricing between supply and market demands.

Meanwhile, according to Kotler and Armstrong [3] decisions about prices are influenced by internal and external factors of the company. Judging from the external aspects of the developer company, it is suspected that there are several factors that influence consumer preferences in choosing housing, including the housing environment preference. Housing environment preference is an internal factor of consumers that is allegedly able to influence the technical specifications of property on pricing property. These internal factors influence consumer behavior that affect consumer property decisions. This will form the level of property demand that can affect the market price of the property. In Wu's [4] research, the existence of a housing environment preference factor has an influence on price formation. Wu [4] studies Housing Environment Preference by adopting dimensions and indicators which include: Mobility, Community facilities, Community social capital.

Buying behavior of property consumers in the future might also possible to move along with increasing public attention to environmental sustainability (environment sustainability), where it creates a pattern of buying behavior called Green Purchase Behavior. Chan in Booi-Chen Tan, Nasreen-Khan, Yong-Hoe Hong and Woon-Har Lam defines green purchase behavior as a type of environmentally friendly behavior that allows consumers to see their attention to the environment [5]. Furthermore, Durif, Wahid, Kim, Mostafa, and Kim and Choi also explained that Green Purchase Behavior is a type of fanatical behavior / pro-environmental behavior [6-12].

Based on the description above, this study aims to examine the effect of green purchase behavior and housing environment preference on property pricing strategies.

#### A. Green Purchase Behavior

Mostafa [10] describes Green Purchase Behavior as buying behavior in environmentally friendly purchasing products or consumption of products that are environmentally friendly, conservable, recycled, responsive and sensitive to concerns of ecological (environmental) matters. Chan in Booi-Chen Tan, Nasreen-Khan, Yong-Hoe Hong and Woon-Har Lam defines green purchase behavior as a type of environmentally friendly behavior that allows consumers to see their attention to the environment [5]. Furthermore, Durif, Wahid, Kim, Mostafa, and Kim and Choi also explained that Green Purchase Behavior is a type of fanatical behavior / pro-environmental behavior [6-12].

Research from Saphores and Li shows that consumer property desires and property values are influenced by the number of surrounding trees and irrigated grasses [13]. According to Liobikienė, the factors that influence or dimension of Green Purchase Behavior variables include: Knowledge of Green Purchases, Confidence in Green Purchases, Subjective Norms, Convenience Level, and Importance of price [14].

In this study, green purchase behavior variables were measured by dimensions referring to Liobikienė which included Knowledge of Green Purchases, Confidence in Green Purchases, Subjective Norms, Convenience Levels, and Importance of prices [14].

#### B. Housing Environment Preference

Wu conducted a study with the aim of understanding housing demand patterns and preferences of young consumers in Guangzhou, China [4]. In his research, Wu used the "Housing Environment" variable and involved several sub-variables such as mobility, community facilities, and community social capital. Where some predictors of these variables are possible to influence property preferences for young consumers as object observations.

The housing environment is not only about the housing environment, but also presents an attitude towards lifestyle. High-quality environments convey a sense of well-being and satisfaction to the population through characteristics that may be physical (housing style and condition, landscape, available facilities), social (neighborly friendliness, ethnicity, race, or economic composition), or symbolic (sense of identity, value prestige) [15].

In his research, Wu sets the housing environment preference variable to include: Mobility, Community, and Community Social Capital [4].

Wu found that "Public Traffic Network" (11.72%), "Proximity to Workplace" (10.22%), "Sense of Safety" (9.74%), "Medical and Health Facility" (8.54%) and "Education Facility" (8.50 %) as the dimensions of the housing environment preference are five determinant factors (top five) which affect 48.72% the intensity of housing purchases made by consumers [4].

In this study the housing environment preference variable is measured by the dimensions that refer to Wu which include: Mobility, Community facilities, and Community social capital [4].

#### C. Pricing Strategy

According to Kotler and Armstrong before determining prices, companies must decide the strategy for their products. According to Kotler and Armstrong decisions regarding prices are influenced by internal and external factors of the company. Internal factors include: marketing objectives, marketing mix strategy, costs, organizational considerations marketing mix strategy costs. While external factors include: the nature of the market and demand, competitive, other environmental factors (economy, resellers, government) [3].

Sammot-Bonnici and Channon define a pricing strategy as a policy adopted by a company to determine how much it will cost for products and services produced by the company [1]. The strategic approach includes three categories, namely cost-based prices, general factors based on competition between pricing strategies, and total revenue generated from prices set multiplied by units sold that must cover operating costs and to allow sufficient profit margins, which secure returns acceptable investment. The choice of pricing strategies adopted by the

company will depend on the overall company's strategy, buyer expectations and behavior, competing strategies, industry changes, and regulatory limits. Other factors that influence the nature of pricing strategies are company image, geography, discounts, price discrimination, and price sensitivity. Bressler and King state that the determination of the price of a commodity is the result of a balance between supply and demand in a single or multiple price market [2]. In addition, from the consumer side, Janiszewski and Lichtenstein argue that consumers judge the attractiveness of market prices by comparing market prices with internal reference prices [16].

Based on the concept study, the variable pricing strategy in this study was measured by using the dimensions of price attractiveness, affordability, expansion and investment strategies.

*D. Relationship between Green Purchase Behavior and Housing Environment Preference with Property Pricing Strategies*

Previous research shows that Green Purchase Behavior affects purchasing decisions where if the purchase decision is proxies, it will form the demand for property, and this demand empirically affects property prices [6-12,17]. Research from Saphores and Li shows that consumer property desires and property values are influenced by the number of nearby trees and irrigated grasses [13]. Joshi and Rahman inform about the main predictors of green purchase behavior. In this way, it will help policy makers and managers in formulating and implementing strategies to encourage green purchases [18].

In addition, previous research also illustrates the influence of the housing environment preference on pricing strategies. Kanchanapibul et al. [assert that ecological and knowledge effects are important in determining the involvement of young consumers in green products and their actual purchases [19]. Nazir et al. concludes that Green Infrastructure contributes to the housing market prices in the Labuan residential area [20]. Glaesener and Caruso show that the presence of a mixture of services and green space does not directly affect prices, but the diversity of land use problems [21]. Based on the explanations above, the hypothesis is conducted as follow:

H1: There is an influence from Green Purchase behavior and Housing Environment Preference on the Pricing Strategy.

**II. METHOD**

The type of research used in this study is verificative explanation research with the research method used is explanatory survey. This is because the method explains the causal relationship between variables through testing hypotheses. The survey is carried out by taking a sample from one population and using a questionnaire as a data collection tool. The unit of analysis in this study is the property industry in West Java. The first observation unit is the property management, while the confirmatory data support is the occupants.

Population is a generalization value consisting of objects or subjects that have certain quantities and characteristics set by the research. The population in this study is 506 companies, samples taken for each city / district. West Java Province consists of 27 districts / cities, so there are 27 samples. Sampling is in accordance with Vinzi's theory that for populations of 20-100 using PLS. Sampling is done by random sampling method [22].

**III. RESULTS AND DISCUSSION**

*A. Results*

*1) Goodness of fit–outer and inner model*

*a) Inner model:* Analysis of structural model (inner model) shows the linkage between latent variable in the study. Inner model is evaluated by using R square and Prediction relevance (Q square) from Stone-Geisser'swith blindfolding procedure. Refers toChin (1998), if the value ofR square amounted to0.67 (strong), 0.33 (moderate) and 0.19 (weak) and Prediction relevance (Q square) 0,02 (minor), 0,15 (moderate) and 0,35 (large). The result of Outer and Inner Model test can be seen in table 2 below.

TABLE II. TEST OF OUTER AND INNER MODEL

Variable	R2	Cronbach Alpha	Compo. Reliability	AVE	Q2
Green Purchase Behavior		0,906	0,921	0,592	0,487
Housing Environment Preference		0,957	0,962	0,659	0,644
Pricing Strategy	0,761	0,937	0,955	0,841	0,836

The table 2 shows that the value of R<sup>2</sup> of Pricing Strategy as endogenous variable in the strong criteria (>0.67), and the value of Q square is in the large criteria (>0.350), so it can be concluded that the research model is supported by the empirical condition or the model is fit.

*b) Outer model:* Analysis of measurement model (outer model) shows manifest variables (indicators) with each latent variables. It is used as validity and reliability test to measure latent variable and indicator in measuring dimension that is construct. It can be explained by the value of AVE and Cronbachs Alpha that is to see the reliability of dimension in measuring variables. If the value of Cronbachs Alpha bigger that 0.70 [23], it show that the dimensions and indicators as reliable in measuring variables. Recommended value of AVE>0.50. Composite reliability and Cronbachs Alpha of variables> 0,70 show that all of variables in the model estimated fulfill the criteria of discriminant validity. Then, it can be concluded that all of variables has a good reliability.

Table 3 shows the result of measurement model for each dimensions on indicators.

TABLE III. LOADING FACTOR OF LATENT VARIABLE-DIMENSION-INDICATOR

Variable-Dimension	$\lambda$	SE( $\square$ )	t-value
Y11 <- Knowledge of GPs	0,841	0,024	34,983
Y12 <- Knowledge of GPs	0,831	0,033	25,191
Y21 <- Confidence in GPs	0,857	0,025	33,982
Y22 <- Confidence in GPs	0,828	0,038	21,941
Y23 <- Confidence in GPs	0,805	0,036	22,536
Y31 <- Subjective Norms	0,863	0,035	24,395
Y32 <- Subjective Norms	0,684	0,050	13,731
Y33 <- Subjective Norms	0,778	0,053	14,654
Y41 <- Convenience Level	0,846	0,026	33,156
Y42 <- Convenience Level	0,794	0,038	20,812
Y43 <- Convenience Level	0,791	0,051	15,486
Y51 <- Importance of price	1,000		
Y61 <- Mobility	0,828	0,024	35,056
Y62 <- Mobility	0,800	0,033	24,103
Y63 <- Mobility	0,786	0,031	25,236
Y64 <- Mobility	0,862	0,021	41,215
Y71 <- Community Facilities	0,817	0,028	29,077
Y72 <- Community Facilities	0,758	0,035	21,683

Table 3. Cont.

Y73 <- Community Facilities	0,829	0,028	29,387
Y74 <- Community Facilities	0,830	0,029	29,054
Y75 <- Community Facilities	0,867	0,025	34,632
Y81 <- Community Social Capital	0,808	0,026	30,581
Y82 <- Community Social Capital	0,748	0,045	16,578
Y83 <- Community Social Capital	0,813	0,032	25,037
Y84 <- Community Social Capital	0,914	0,015	62,150
Z1 <- Pricing Strategy	0,921	0,010	93,528
Z2 <- Pricing Strategy	0,909	0,018	51,254
Z3 <- Pricing Strategy	0,914	0,012	73,586
Z4 <- Pricing Strategy	0,924	0,013	70,244

The result of measurement model of dimensions by its indicators show that the indicators are valid which the value of  $t > 2.04$  (t table at  $\alpha = 0.05$ ). The result of measurement model of latent variables on their dimensions shows to what extent the validity of dimensions in measuring latent variables.

Figure 1 shows that all latent variables have Cronbach's Alpha more than 0.70 as well as figure 2 shows that all t-value are more than 2.04. Figure 1 and figure 2 describes that all variables in this model are valid and reliable

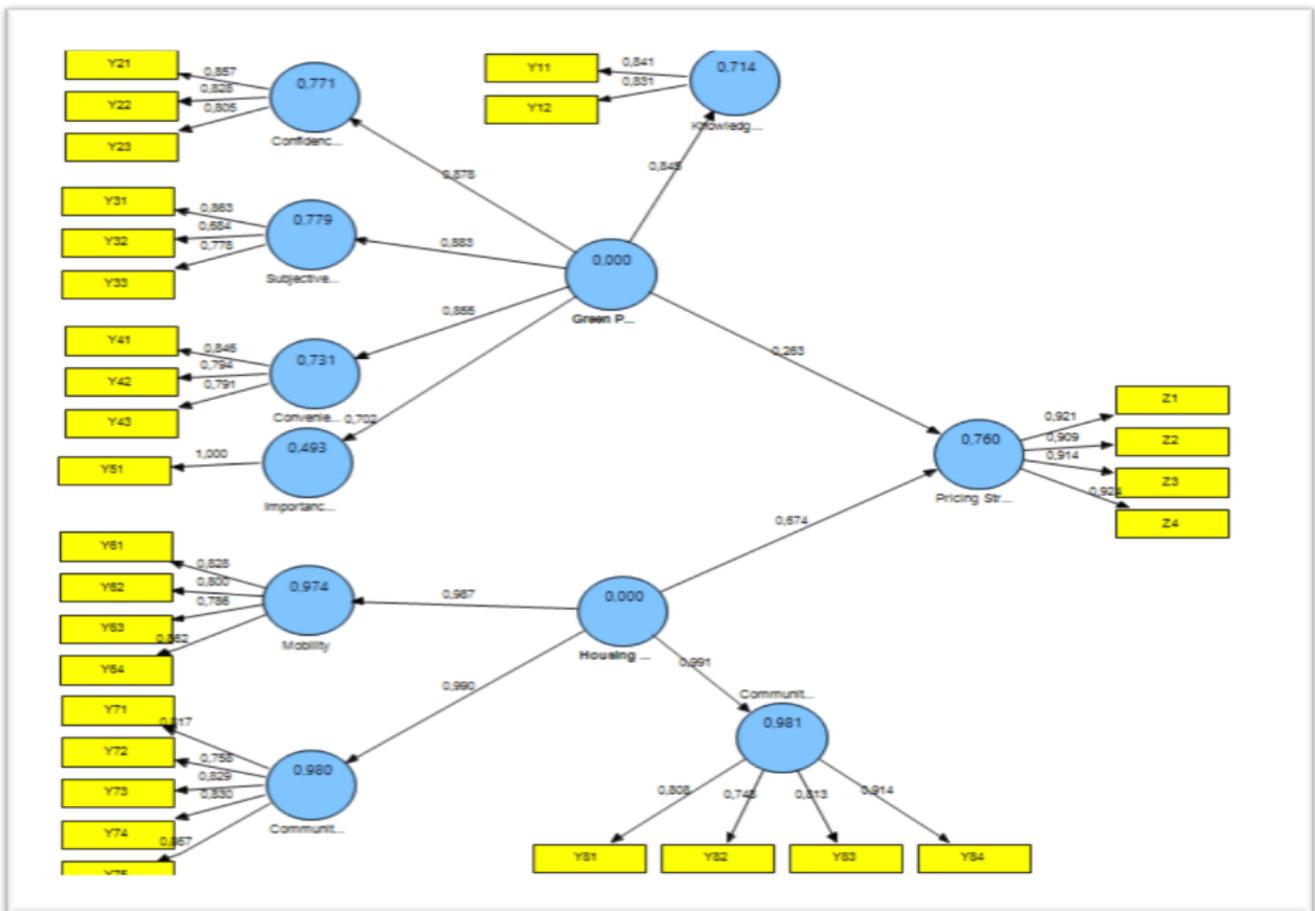


Fig. 1. Complete path diagram of research model.

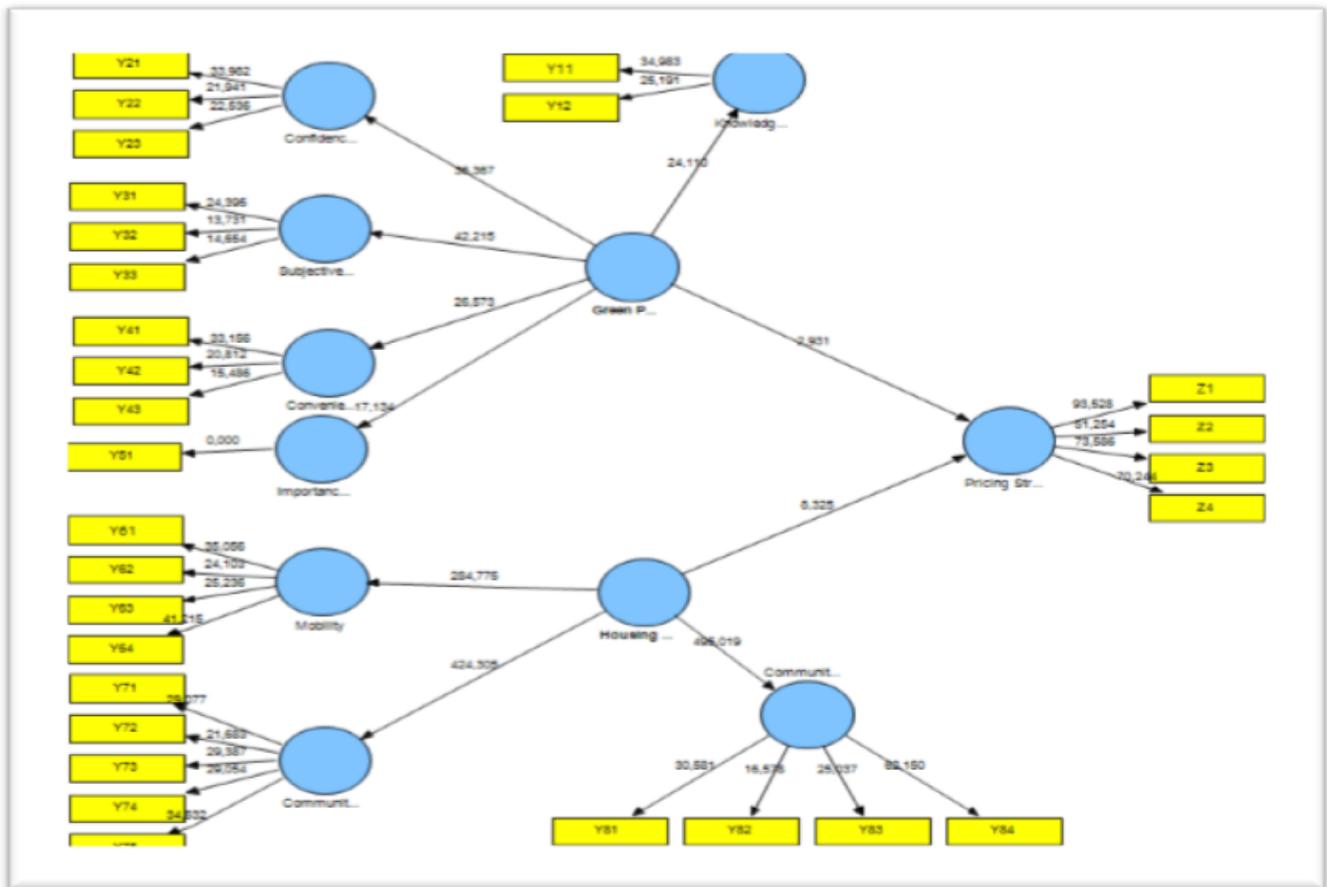


Fig. 2. Complete t value of research model.

2) *Structural model*: Based on the research framework, then obtained a structural model as follow.

$$\eta_1 = 0.263\xi_1 + 0.674\xi_2 + \zeta_1$$

Which are :

$\eta_1$  = Pricing Strategy

$\xi_1$  = Green Purchase Behavior

$\xi_2$  = Housing Environment Preference

$\zeta_i$  = Residual

3) *Hypothesis testing result*: Table 4 show sthe result of hypothesis testing simultaneously and table 5 is the result of hypothesis testing for partially.

a) *Simultaneous hypothesis testing*: Below is the result of simultaneous testing of hypothesis.

TABLE IV. SIMULTANEOUS TESTING OF HYPOTHESIS

Hypothesis	R <sup>2</sup>	F	Conclusion
Green Purchase Behavior and Housing Environment Preference -> Pricing Strategy	0.761	39.682*	Ho rejected

\* significant at  $\alpha=0.05$  (F table =3.195)

Based on the table 4, it is known that within the degree of confidence of 95% ( $\alpha=0.05$ ) simultaneously there is the influence of Green Purchase Behavior and Housing Environment Preference on Pricing Strategy; amounted to 76.1%, while the rest of 23.9% is affected by other factor did not examined.

b) *Partial hypothesis testing*: Below is the result of partial testing of hypothesis.

TABLE V. PARTIAL TESTING OF HYPOTHESIS

Hypothesis	$\gamma$	SE	t	R <sup>2</sup>	Conclusion
Green Purchase Behavior -> Pricing Strategy	0,263	0,090	2,931*	0,188	Ho rejected
Housing EnvironmentPreference -> Pricing Strategy	0,674	0,081	8,325*	0,573	Ho rejected

\* significant at  $\alpha=0.05$  (t table =2.01)

The table 5 shows that partially, Green Purchase Behavior and Housing Environment Preference influence the Pricing Strategy, which is Housing Preference Environment has a greater influence (57.3%).

Based on hypothesis testing result, the Research Model Finding is described as figure 3 below.

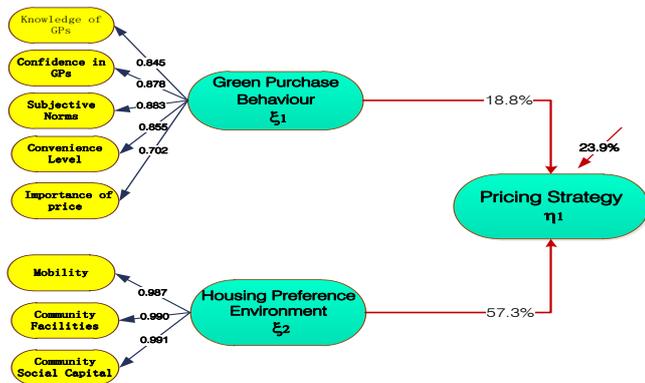


Fig. 3. Research finding.

### B. Discussion

The research findings show that the pricing strategy is influenced by green purchase behavior and the housing environment preference, where the dominant contribution is obtained from the housing environment preference (57.3%) compared to the contribution of green purchase behavior (18.8%).

In terms of housing environment differences, aspects of community social capital have the highest level of influence compared to community facilities and mobility in influencing pricing strategies. Community social capital, which includes aspects such as the level of environmental density, the level of neighbor harmony, the level of security of residents, and a sense of togetherness, turned out to have the greatest impact in creating a housing environment preference that had an impact on pricing strategies. While community facilities cover aspects: internet facilities, sports facilities, adequate number of markets, quality education, and health facilities. Mobility includes the ease of going to the workplace, the level of quality of the public transportation system, the quality of the private transportation system, the distance to the city center. Both aspects also have an influence in shaping the pricing strategy.

Housing environment preference is an internal factor of consumers which is thought to be able to influence the property's technical specifications on property pricing. These internal factors affect consumer behavior that affect consumer property decisions. This will form the level of property demand which can affect the market price of the property. Nur Syuhadah's study states that A house is no longer a basic shelter, but is now described as a status symbol and an asset for its owners because it provides security, privacy, environment and social relations, status, facilities and community services, access to jobs and control of the environment [24]. The test results are in line with the findings of Wu that the housing environment preference factor has an influence on price formation [4].

The second variable that plays a role in influencing the pricing strategy is green purchase behavior. Subjective norms have the highest level of influence followed by confidence in GPs, convenience levels, knowledge of GPs, and important of prices. Subjective norms are related to the level of consumer feelings in justifying their actions in buying environmentally

friendly homes, the level of agreement that buying an environmentally friendly house is an example, and the level of increasing social image in the eyes of the community for buying environmentally friendly homes. These aspects are the main factors in terms of green purchase behavior which are considered in the pricing strategy, followed by confidence in GPs, convenience levels, knowledge of GPs, and important of prices.

The results of testing this hypothesis which states that green purchase behavior has a significant effect on pricing strategies, supports several previous studies showing the results that the Green Purchase Behavior affects purchasing decisions [6-12,17]. This finding also supports the results of research by Saphores and Li [13] and Joshi and Rahman [18].

### IV. CONCLUSION

The research findings show that the pricing strategy is influenced by green purchase behavior and the housing environment preference, where the dominant contribution is obtained from the housing environment rather than the contribution of green purchase behavior. In terms of housing environment differences, aspects of community social capital have the highest level of influence compared to community facilities and mobility in influencing pricing strategies. While in terms of green purchase behavior, the Subjective norm has the highest level of influence which is followed by confidence in GPs, convenience level, knowledge of GPs, and important of prices in the property pricing strategy.

This finding has implications for the management of residential property developers that the property pricing strategy must consider aspects of the housing environment preference and green purchase behavior. The strategy of determining property prices is mainly formulated by considering the aspects of community social capital, community facilities and mobility, accompanied by an understanding of Subjective norms, confidence in GPs, convenience levels, knowledge of GPs, and important of prices.

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