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Determining the factors influencing residential property price: A comparative study between Indonesia and Malaysia

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A B S T R A C T

The property is a unique product that cannot be contrasted with other commercial products due to pricing conditions. Property price determination is one of the crucial aspects of property development activities because of the profit margin made by the developer and the purchasing preferences. This study attempts to extend the literature that has largely focused on factors of housing prices in developed markets and provided recent evidence of housing price determinants in two countries (i.e., Indonesia and Malaysia). Thus, this study examines the factors affecting housing prices in Jakarta Metropolitan Region and Greater Kuala Lumpur. A quantitative approach was used involving two countries, namely Indonesia and Malaysia. The data was collected using a survey questionnaire through purposive sampling. A total of 100 respondents (Indonesia) and 134 respondents (Malaysia) participated in this study. The data was analyzed using descriptive (frequency) and inferential statistics (chi-square test and multinomial regression). The results indicated that housing location, property funding, and health have a significant effect on residential property prices in Indonesia. Besides that, the results displayed that housing physical design, home design and construction, developer and real estate products, development concepts, housing location, property funding, social status, health, law provisions, and external factors do not affect residential property price in Malaysia. Despite being neighbors, Indonesia and Malaysia have distinct economic and landscape characteristics. Furthermore, considering Indonesia has a higher number of Covid-19 cases than Malaysia, significant information on how the pandemic has affected the demand, cost, and pricing of residential housing in Jakarta and Kuala Lumpur will be provided. The findings of this study will provide recommendations to investors, buyers, and policy about the residential housing industry's prospects for growth in emerging nations following the pandemic.

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1. Introduction

The property is a unique product that cannot be contrasted with other commercial products due to two pricing conditions (Dhar & Wertenbroch, 2000; Vernon, 1992). Property price determination is one of the crucial aspects in property development activities considering it will influence the profit margin made by the developer and the purchasing choice of the property buyer (Byrne, 2002; Graaskamp, 1992). Hoeffler (2003) said that the first is the product's provided condition

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are the product's natural embedded condition, which includes things such as the property's location, land shape, physical state, and natural resources. The second is the condition created by the property developer to enhance the value of the product, such as facility development, security features, non-gated access, and design. As a pricing strategy, property developers frequently factor in relevant property development expenses and a predetermined profit margin into the selling price (Bryson & Lombardi, 2009). However, they are also looking for any beneficial features of the property that help drive the selling price up even higher for better profits.

From the consumer point of view on the property, they considered numerous essential aspects generated by the property and created a condition for purchasing the product, which they computed using the product's price. Thus, the weighing and decision-making process takes place, and next can be affected by marketing gimmicks and ingenuity. Finally, the price would be agreed if the client has accepted the assumption of key factors. Any accepted price would set the market price in the locality and be referred to by other buyers when making property purchases (Scarrett & Osborn, 2014). These variables are often influenced by external control and have a skewed effect on equal calculation of prices. Some examples of these factors include business dynamics such as speculations that consider property products as an investment commodity, friends or relatives, and property developers' promotion (Searle, 2014).

According to the 2020 World Population Review, the population in Jakarta is now estimated at 10,770,487, with an annual change of 1.15 percent. This situation totally makes Jakarta an enormous market for land developers. Jakarta and its satellite cities (Bogor, Depok and Bekasi) have contributed the greatest revenue to the overall real estate sector in Indonesia (Firman, 2009). Meanwhile, Kuala Lumpur as the capital city of Malaysia has been the most developed Metropolis due to its prominent centre for economic and financial activities. It had about 1.73 million population in 2016 and keeps growing. Recognizing that Kuala Lumpur is among the fastest growing cities in ASEAN, the Malaysian government has coined the Greater Kuala Lumpur status as part of the Malaysian Economic Transformation Program (ETP) launched in 2010 (Hong & Nooi, 2014). Administratively, those areas are under 10 local authorities with high population density and economic activities. It is a strategy to integrate more geographical and physical development into the economy and social development benefits.

In regard to the property market, Malaysia is capitalizing the involvement of private developers, government linked developers and government agencies to actively develop and offer real estate developments into the market (Menon & Ng, 2013, 2017). Despite the involvement from various property development entities that would lead to stiff competitions, it is realistic to assume that each property developer would have a product offering and market segment strategies. The property market in Malaysia is in a dynamic trend, whereby it could be affected by any major occurrence in the global and local market. Focusing on the residential property market, which is easily observed on the Malaysian House Price Index (MHPI), the market has shown a consistent gain from year to year between 2010 and 2020, albeit turning quiet after 2014. It's suggested that the market is correcting itself following a significant rise between 2010 and 2014. The property market in Malaysia, especially Kuala Lumpur, is expected to remain weak in 2020. According to the National Property Information Centre (NAPIC), property market performance declined significantly in the first half (1H) of 2020, in accordance with Malaysian economic performance, which decreased by 17.1 percent in the second quarter (Q2) of 2020.

Considering the pricing value of real estate items for house customers, real estate developers, the government, and real estate brokers is a difficult assignment. The value is difficult to calculate due to its heterogeneity and the amount of transaction that occurs does not reflect market prices in an imperfect real estate market (Aluko, 2007). The other issue arises from the divergent perspectives of the developer of real estate and its client. Typically, the two viewpoints and point of view did not agree to achieve equal outcomes. Research findings show that the skills and abilities of real estate valuers affect the most appropriate value of real estate prices.

However, the real estate industry also takes a different hit currently. At the end of 2019, the office of the World Health Organization (WHO) in China received notification of a type of pneumonia of unknown cause. In the city of Wuhan, Hubei Province, China, an acute respiratory infection affecting the lungs was discovered. The corona virus outbreak extended throughout the world in these cases, even Indonesia and Malaysia became countries affected by the pandemic. The Covid-19 pandemic has wreaked havoc on all Indonesian businesses. This condition threatens to even cause some companies to go bankrupt because they are unable to meet their debt obligations. The national economy is predicted to be lower than in previous periods. The main cause is the corona virus or Covid-19 outbreak which has spread to almost all countries in the world including Indonesia, thus threatening the stability of the global economy. There are also concerns that the low economic growth projection will disrupt the domestic property market, which has been lethargic for the past five years. The decline in demand due to the corona virus is also expected to suppress supply from developers.

The purpose of this study is to examine the factors affecting housing prices in Jakarta Metropolitan Region and Greater Kuala Lumpur. This study concentrates solely on housing items, because, unlike other major cities around the world, most Indonesians still tend to stay and live-in landed housing compared to vertical housing such as apartments, flats, or condominiums. Meanwhile in Kuala Lumpur, there is a mismatch between property price and people's ability to purchase the house.

2. Literature review

2.1 Consumer perfrences in residential products

According to Steggel et al. (2003), there has been some improvement in consumer behavior theory for residential items throughout the years (2003). They can examine which hypothesis is prevalent in housing research, based on the most cited theories in housing research.

Table 1
Theory citations in housing research

Housing Theory	Citations	
	Number	Percentage
Theory of Housing Adjustment	19	22.6
Person-Environment Congruence Theory	5	5.9
Diffusion of Innovation Theory	4	4.8
Symbolic Interaction Theory	4	4.8
Social Exchange Theory	4	4.8
Causal Model of Barriers and Incentives to Affordable Housing	4	4.8
Amenity Retirement Migration Model	2	2.4
Development Perspective on Elderly Migration	2	2.4
Social Construction Paradigm	2	2.4
Theory of Human Motivation	2	2.4
Typology of Elderly Migration	2	2.4
Transactional Model	2	2.4
Other theories	32	38.1

Source: Steggel et al., 2003

Consumer behavior is best characterized as "mental and physical activities carried out by clients of households and businesses that result in decisions and actions to pay for, buy and use products and services" (Sheth et al., 1999). Consumer behavior analysis is significant because it serves three purposes: a fundamental marketing principle holds that corporations exist to serve consumer needs. When purchasing a product, the sort of item purchased, whether it is considered high-involvement or low-involvement, is usually taken into consideration (Mullins, Walker, & Boyd, 2012). The high-involvement item involves significant items, which requires a great deal of capital, and deals with a complicated decision-making process to attain a final decision.

In the purchase of housing items, customers' decision is generally affected not only by the provided information, but also by their environment (Handfield et al., 2002). Family members, friends and even real estate agents/brokers are engaged in influencing customers' decisions (DeMarco, 2016). Consumers are typically influenced by three variables when searching for information: product variables, situational variables, and personal traits (Schmidt & Spreng, 1996). The evaluation of alternative goods or services has historically played the most important role in consumer decision-making (Mullins et al., 2012). Cost attributes, output attributes, social attributes, and availability attributes are the four attributes that characterize the product evaluation process. Meanwhile, Lake (2009) stated that consumer behavior is influenced by three social factors: society and subculture subcategories, social status and comparison groups, and family subcategories.

2.2 Real Estate Price Modeling

The study addressed the methods used for real estate valuation and several pricing models widely used in real estate valuation, including the Hedonic Pricing Model; Spatial Analysis; and the Artificial Neural Network.

1. Hedonic Pricing Model

According to Dixon, Scura, Carpenter, & Sherman (2013), a theory of hedonic prices was developed as a problem in the economics of spatial equilibrium in which the entire set of implied prices directs both consumer and producer location decisions in characteristic space. The initial studies were conducted for Property Product by examining historical landmarks and design as quality variables for evaluating the allocation of prices for certain real estate products (Cömertler, 2007; Hough & Kratz, 1983). The method is considered as traditional in forecasting the property price, but it has been criticized as less accurate due to nonlinearity, multicollinearity and heteroskedasticity problems (Rahman et al., 2019).

2. Spatial Analysis

The objective of spatial analysis is to calculate attributes and correlations while taking into consideration the phenomenon's physical location (Câmara et al., 2004). In 1854, John Snow performed the initial research for spatial analysis to investigate the relationship between cholera death locations relative to the water pump location in London. The method analyzes the spatial heterogeneity and claims to be better in describing the market relationships than the conventional regression models based on the Hedonic Pricing Model (Cellmer et al., 2020).

3. Artificial Neural Network

A network of brain nerve cells originates from the Artificial Neural Network (Rossini, 1997). The Artificial Neural Network (ANN) is a model of information processing inspired by how information is processed by biological nervous systems, such as the brain. It consists of many strongly integrated computing components (neurons) that collaborate to solve problems. Its mathematical model and computational process is considered superior in forecasting the property price because of its ability to self-learn and generalize results despite an incomplete data set (Ćetković et al., 2018; Rahman et al., 2019).

2.3 Property Developer Marketing Strategy

Marketing is a social or managerial process in which individuals or groups obtain what they want and need either by creating it themselves, through the exchange of products and values with other parties (Kotler & Keller, 2008). Marketing is important for real estate developers as it allows them to communicate their existence to the market, position their branding and real estate products in the market, provide product information to customers through advertising and effectively engage the customers in the selling process and after sales (Giantari & Sukaatmadja, 2021). In marketing, there are many well-known influential hypotheses, including Porter's Five Strategic Powers, Marketing Combination, Consumer Appeal Matrix, and Positioning and Distinction.

1. Porter’s Modified Six Competitive Forces

Presumably, looking at the real estate market in Indonesia, these characteristics are likely to be present. Companies experienced fierce rivalry among similar developers in real estate, prompting them to implement different selling strategies to overcome the competition. The risks to new entrants are also prevalent, as the entrance hurdle to investing in Indonesian real estate operations is low. Alternative goods pose a significant threat in Indonesia as well. When it comes to real estate purchases, there are two types of customers. One is the individual who buys real estate products for their own use, and the other is the individual who buys real estate products for investment. The government regulates the firm through enacting new regulations, legislation, and restrictions that affect real estate developers, consumers, and vendors, as well as determining the entry barrier.

2. Marketing Decisions for High-involvement Products

The strategy for attracting consumers is carried out by evaluating the components of the marketing mix to affect consumer preference when buying a product. As seen from the viewpoint of the property buyer the commodity preference is what product can be marketed and whether it is sufficiently desirable for the buyer to purchase it.. In terms of selling, developers typically settle on the price range in which buyers are perceived to be interested.

3. Market Attractiveness Matrix

A property developer may assess their position in the industry by analyzing their current position and mapping the potential position of their business by constructing a market-attractiveness matrix. The steps begin with determining the parameters to be measured, followed by establishing a market appeal measurement, analyzing their current market position, predicting their potential position, and evaluating them by contrasting current and future positions (Mullins et al., 2012).

4. Differentiation and Positioning

In Marketing, a corporation can outweigh its competitors by conducting a certain positioning and market differentiation strategies (Mullins et al., 2012). Before releasing a product in the real estate industry, a developer must decide on his strategy.

2.4 Covid-19 Pandemic Impact on Property

The coronavirus pandemic will have the potential to have a tremendous impact on global property markets. With massive unemployment, wage cuts, business failures, and job uncertainty, many people are likely to be cautious about making the biggest investment of their lives - buying a home. Normally that leads to falling house prices (BBC, 2020). The COVID-19 crisis significantly impacted the residential real estate market. During a pandemic, fewer customers were shopping for homes, and fewer sellers were willing to offer their properties or allow strangers into their homes due to health concerns and stay-at-home orders. Despite the steep decline in early spring, home sales rebounded in the summer. Simultaneously, the health crisis generated an economic toll in the form of job losses and uncertainty (Federal Reserve Bank of St. Louis., 2020). Many people still have concerns about the US housing crisis of 2007-09, and there is a concern that it would also influence the Indonesia and Malaysia market, as some homeowners have struggled to make mortgage payments and the unemployment rate remains at historic highs. Due to the pandemic, many households are reconsidering their housing needs, as their homes have become substitutes for offices, schools, restaurants, and recreation facilities. Following the pandemic, it is projected that settlement planning and building decisions, as well as investment techniques, will change. It is often argued that during and after the outbreak, Malthus's population theory 1798 supposedly happened, that there would be

changes in the measurement of production, profitability, and utility (Malthus, 1986). It is expected that new approaches to the economy of solidarity and space in the urban area will be developed and new professions and business areas will emerge rapidly. The housing market will be stable, but the change in commercial real estate markets will accelerate. Many people will be ambivalent between allocating their equity to new fixed investments and opting for deposits, foreign exchange, gold, and other related securities investments, and will be able to turn to short-term investments. This will lead to a decline in investment and production, weakening growth and inability to increase employment. For real estate and property owners and users, there may be changes in credit usage, rental, and contracts (Tanrıvermiş, 2020). To assure the outcome and rate of significance for these factors, the study conducted statistical analysis utilizing the qualities that uniquely affect the costs of housing items in the Jakarta Metropolitan Region and Greater Kuala Lumpur. The model used in this study derived from the previously created model by Rahadi, Wiryono, Koesrindartoto, & Syamwil (2016) as follows:

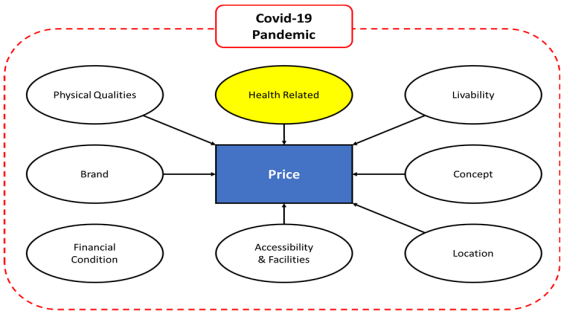


Fig. 1. Conceptual model of the study

Source: Modified from Rahadi et al. (2016)

3. Methodology

This research is carried out using quantitative approaches. The study was carried out using organized, self-administered, and close-ended questionnaires for a quantitative approach (Lawrence, 2014). The questionnaire items derived from the previous study by the authors (Rahadi et al., 2016). The questionnaire consisted of two main sections: the first section questioned about background and demographic information of the respondents while the second section were preference variables from the previous qualitative research performed by the authors. For this research, as in the university there is no ethics committee, the consent was asked directly to the participants in the study when the questionnaire was deployed.

Table 2
Attributes Influencing Housing Product Price

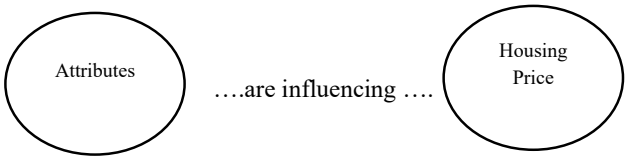
Attributes	Code	Indicators
Physical Qualities	PQ1	Façade
	PQ2	Infrastructure
	PQ3	ROW
	PQ4	Rooftop Design
	PQ5	Product Specification
	PQ6	Floor Plan Layout
	PQ7	Overall Physical Qualities
Concept	Con1	Green Concept
	Con2	Development Scale
	Con3	Theme & Story
	Con4	Following Trend
	Con5	Grand Cluster
	Con6	Premium Facilities
	Con7	Cluster Concept
	Con8	Type Variations
	Con9	Overall Concept
Brand	Bra1	Developer's Commitment
	Bra2	Quality
	Bra3	After Sales Services
	Bra4	Reputation
	Bra5	Overall Brand
Accessibility & Facilities	Acc1	Direct to All Road Access
	Acc2	Good Security System
	Acc3	Good Social Communication
	Acc4	Ease Accessibility
	Acc5	Overall Accessibility & Facilities

Attribute	Code	Indicators
Location	Loc1	Near Family
	Loc2	Near Workplace
	Loc3	Near Activity Center
	Loc4	Near Shopping Center
	Loc5	Near Education Center
	Loc6	Near Religious Center
	Loc7	Near Transport Hub
	Loc8	Unique Location
	Loc9	Overall Loaction
Liveability	Liv1	Prestige
	Liv2	Social Status
	Liv3	Lifestyle
	Liv4	Privacy
	Liv5	Complete Feature
	Liv6	Similar Age & Background
	Liv7	Overall Liveability
Financial Condition	FC1	Alternative Payment
	FC2	Reinvestment Value
	FC3	Economic Background
	FC4	Pricing Scheme
	FC5	Overall Financial Condition
Health Related	HR1	Air Quality
	HR2	COVID-19 Related Design
	HR3	Neighbourhood Quality
	HR4	Overall Health Related

Source: Modified from Rahadi et al. (2015)

Forty-five initial question items and four Covid-19 related questions. The forty-nine questions items were separated into eight groups: physical qualities, brand, concept, location, accessibility, financial condition, livability, and new Health

Related variables. All of the question's items used a six-point Likert scale from 1 equal "strong disagreement" to 5 equal "strong agreement". All of the research questions were arranged with this following format:



"I think these (attributes) are influencing the price of housing product price in Metropolitan Region"

Fig. 2. Questionnaire Model for Comparing Preferences

Source: Rahadi et al. (2016)

The study also added the Covid-19 pandemic parameter as a mediating factor to understand how pandemic has changed the demand, cost, and prices of residential housing in Jakarta and Kuala Lumpur.

3.1 Validity and Reliability Test

A questionnaire, which aims to find out a person's opinion about things, is one of the instruments frequently used for primary data retrieval in scientific research. Related to that, there are two important set of conditions to measure instruments, namely the requirement of a questionnaire for Validity and Reliability.

Validity test

Validity, in this study, means the extent of the accuracy and accuracy of a measuring instrument in performing its measuring function. The validity of a measuring instrument is determined by whether the measuring instrument correctly achieves the desired measurement goal. A question on a questionnaire is considered valid if it reveals an outcome that will be measured by the questionnaire. The correlation or support of the entire item (total score) indicates the validity of the item; calculation is done by correlating between the item score and the overall item score. To determine validity and to find correlations between each question and a total score, Pearson correlation technique formula is used, as shown below:

$$r = \frac{n\sum_{i=1}^{n} x_i y_i - \sum_{i=1}^{n} x_i \sum_{i=1}^{n} y_i}{\sqrt{(n\sum_{i=1}^{n} x_i^2 - (\sum_{i=1}^{n} x_i)^2)\,(n\sum_{i=1}^{n} y_i^2 - (\sum_{i=1}^{n} y_i)^2)}}$$

r: Pearson correlation coefficient
x_i: score of each question/ item on the respondent i, with i = respondent to 1, 2, ..., n
y_i: total score on the i respondent, with i = respondents to 1, 2, ..., n
n: Number of respondents

Following the completion of the correlations between each question and the total score, the results were compared to the test statistics on the inferential analysis. The Validity Test uses the following hypotheses:

H_0: Questions on questionnaires are invalid ($r \leq 0$)
H_1: Questions on questionnaires are valid ($r > 0$)

Pearson correlation results can be used as test statistics to rejectH_0 if $r_{count} > r_{table}$ with degrees of freedom (df) = n-2, Pearson correlation results can be used as test statistics to reject H_0 if the $r_{count} > r_{tabel}$ with a free degree (db) = n-2, or other usable test statistics are in the form of P-Value (the amount of possibility not to reject H_0 if found P-Value of the validity test result is less than α, which is 5% (0.05), then H_0 is rejected. If H_0 is rejected, then the question on the questionnaire is valid. Meanwhile, if there are any invalid items/questions, the validity tests are repeated until all items/questions are valid.

Reliability Test

A reliability test determines the extent to which a measurement can provide the same result when repeated on the same Section, as long as the aspects measured in the respondent do not vary. When a person's answers to questions are constant or stable throughout time, a questionnaire is said to be reliable.

3.2 Chi-Square Test

The purpose of the Chi-Square Test is to examine the association between two category variables. The chi-square test can also be used to determine whether or not a categorical independent variable has an impact on a dependent variable. This test uses an alpha error rate (α) of 5% with the following hypothesis test details:H_0 (prior hypotheses) is an independent variable that has no effect on dependent variables.; and

H_1: an independent variable that has effect on dependent variables.

The test statistics utilized in the Chi-Square Test are P-Values (the amount of potential not to reject H_0: If the P-Value discovered from the chi-square test findings is less than, which is 5% (0.05), then H_0 is rejected. However, if H_0 is rejected, the dependent variable is affected by the independent variable that was tested.

3.3 Multiple Ordinal Regression Analysis

Double Ordinal Logistic Regression is a form of regression that makes it possible to predict the likelihood of occurrence of events in dependent variables with (independent) variables a mixture between numeric and categorical. This form of regression is ordinal and has a total value in dependent variables of greater than two. A logistic regression model with multiple independent variables is referred to as multiple logistic regression.
The model on multiple ordinal logistic regression is as follows:

$$Logit(Y = y_i) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_j x_j$$

with:

y_i = Property price preferences of respondent i
$x_1, x_2, \ldots, x_j$ = 1st to j independent variable (j = last variable)
β_0 = Model Value if respondents are on reference variables in each independent variable
$\beta_1, \beta_2, \ldots, \beta_j$ = Coefficients for the 1st to j independent variables (j = the last variable).

The following functions can be used to obtain the probability value of an event on a dependent variable:

$$P(Y = y_i) = \frac{e^{Logit(Y=y_i)}}{1 - e^{Logit(Y=y_i)}}$$

with:

$P(Y = y_i)$ = The probability of the respondent choosing the price preference of the i property.

Following the creation of a model, independent variables can be measured for their effect on dependent variables. This is implemented to maintain that independent variables retain their influence if they are incorporated into the model but not tested individually. This test has a 5% alpha (α) error rate and the following hypothesis test details: H_0 (prior hypotheses) is an independent variable that has no effect on dependent variables; and H_1 (alternative hypotheses) is an independent variable that has effect on dependent variables. The results of the Chi-Square Test used test statistics in the form of P-Value (the amount of possibility not to reject H_0 if P-Value is found to be less than α, i.e., 5% (0.05), then H_0 is rejected. Thus, if H_0 is rejected the independent variable tested has an effect on the dependent variable.

4. Results

4.1 Descriptive Analysis

This section reports the result of descriptive statistics by involving the variables are gender, age of respondents, job status, personal income, household income, household expenses and Property Price Preferences.

With a total of 56 respondents, data on research in Indonesia is dominated by male. The study in Malaysia was dominated by females, with 89 respondents. The age group of 21-30 years, or millennials, dominates research data in Indonesia, followed by the age group of 31-40 years. In general, the study is large enough to place young workers in the middle of the age range. The age group 21-30 years or millennials dominated the data on the Malaysian study, with 82 respondents, followed by the age group 20 years, with 24 respondents. In general, the study was extensive, focusing on the age group of young workers and students. Private employees, with 49 respondents, are the most common respondents in Indonesian research, followed by students (19 respondents), and civil servants (18 respondents). Workers have a stronghold on respondents. In Malaysia, data on study is dominated by private workers, who have 54 respondents, followed by students, who have 46 respondents. Workers and students account for the majority of respondents.

With 62 respondents, the data on research in Indonesia is dominated by respondents with a personal income of less than IDR 5,000,000 to IDR 10,000,000. This is consistent with the fact that most respondents are young municipal employees. With a total of 88 respondents, the survey in Malaysia was dominated by respondents with a personal income of less than RM 2,500. This is in accordance with the fact that young workers and students make up many responses. With a total of 56 respondents, the data on research in Indonesia is dominated by respondents with household incomes ranging from less than IDR 5,000,000 to IDR 10,000,000. In Malaysia, respondents with a household income of less than RM 5,000 led the data, with 73 respondents, followed by respondents with a family income of less than RM 10,000, with 30 respondents. With 92

respondents, the data on research in Indonesia is dominated by respondents with household expenditures ranging from less than IDR 10,000,000 to IDR 20,000,000. With a total of 97 respondents, the Malaysian study's data was dominated by respondents with monthly bills of less than RM 5,000.

Table 3
The result of descriptive statistics between Indonesia and Malaysia

Demography	Category	Frequency	
		Indonesia	Malaysia
Gender	Male	56	45
	Female	44	89
Age	20 year and below	3	24
	21-30 year	53	82
	31-40 year	27	9
	41-50 year	8	14
	51-60 year	8	5
	61 and above	1	0
Job Status	Government Staff	18	15
	Private Employees	49	54
	Student	19	46
	Freelance	9	11
	Owned Business	5	8
Personal Income	IDR 5,000,000.00 (RM 2,500.00) and below	29	88
	IDR 5,000,000.00 - 10,000,000.00 (RM2,501.00 – RM 5,000.00)	33	24
	IDR 10,000,001.00 - 15,000,000.00 (RM5,001.00 – RM 7,500.00)	12	6
	IDR 15,000,001.00 - 20,000,000.00 (RM7,501.00 – RM 10,000.00)	6	10
	IDR 20,000,001.00 (RM 10,000.00) and above	20	6
Household Income	IDR 5,000,000.00 (RM 5,000.00) and below	35	73
	IDR 5,000,000.00 - 10,000,000.00 (RM5,001.00 – RM 10,000.00)	21	30
	IDR 10,000,001.00 - 15,000,000.00 (RM10,001.00 – RM 15,000.00)	9	9
	IDR 15,000,001.00 - 20,000,000.00 (RM15,001.00 – RM 20,000.00)	7	11
	IDR 20,000,001.00 (RM 20,001.00) and above	28	11
Household Expenses	IDR 10,000,000.00 (RM 5,000.00) and below	66	97
	IDR 10,000,001.00 - 20,000,000.00 (RM5,001.00 – RM 10,000.00)	26	25
	IDR 20,000,001.00 - 30,000,000.00 (RM10,001.00 – RM 15,000.00)	4	10
	IDR 30,000,001.00 - 40,000,000.00 (RM15,001.00 – RM 20,000.00)	2	1
	IDR 40,000,001.00 (RM 20,001.00) and above	2	1
Property Price Preferences	IDR 500,000,000.00 (RM 250,000.00) and below	25	28
	IDR 500,000,001.00 – 1,000,000,000.00 (RM250,001.00 – RM 500,000.00)	37	69
	IDR 1,000,000,001.00 – 2,500,000,000.00 (RM500,001.00 – RM 750,000.00)	29	26
	IDR 2,500,000,001.00 – 5,000,000,000.00 (RM750,001.00 – RM 1,000,000.00)	6	6
	IDR 5,000,000,001.00 (RM 1,000,001.00) and above	3	5

Most respondents in Indonesia chose any house with prices between IDR 500 million and IDR 1 billion, with 37 individuals responding. It is followed by house prices between IDR 1 billion and IDR 2.5 billion, with 29 people responding. As a result, the average Indonesian respondent wants to purchase a home for a low to medium price range. With 69 respondents, many Malaysians chose a house price range of RM 250,000 to RM 500,000, followed by a house price range of less than RM 250,000 with 28 respondents, and a price range of RM 500,000 to RM 750,000 with 69 respondents. As a result, the average Indonesian responder chooses to purchase a house within a low to moderate price.

4.1 Results of Validity and Reliability

Housing Physical Design, Home Design and Construction, Developers and Real Estate Products, Development Concepts, Housing Locations, Property Financing, Social Status, Health, Legal Provisions, and External Factors are all Sectioned to the Validity and Reliability Test. A combination of the two was used for this experiment.

Table 4
Validity and Reliability of Housing Physical Design

Variable(s)	Cronbach's Alpha	N-Item	Decision
Housing Physical Design	0.940	9	Reliable
Home Design and Construction	0.970	21	Reliable
Real Estate Developers and Products	0.958	8	Reliable
Development Concepts	0.957	8	Reliable
Housing Location	0.958	11	Reliable
Property Financing	0.956	6	Reliable
Social Status	0.947	5	Reliable
Health	0.951	5	Reliable
Legal Provisions	0.950	5	Reliable
External Factor	0.964	3	Reliable

Table 4 displays the result of validity and reliability testing. The results indicated that the value of Cronbach Alpha is higher than 0.60 and value of corrected to item total correlation is higher than 0.30. It means that the measurement scales used in this study are valid and reliable. Housing Physical Design (Cronbach Alpha is 0.940 with 9 items), Home Design and Construction (Cronbach Alpha is 0.970 with 21 items), Real Estate Developers and Products (Cronbach Alpha is 0.958 with 8 items), Development Concepts (Cronbach Alpha is 0.957 with 8 items), Housing Location (Cronbach Alpha is 0.958 with 11 items), Property Financing (Cronbach Alpha is 0.956 with 6 items), Social Status (Cronbach Alpha is 0.947 with 5 items), Health (Cronbach Alpha is 0.951 with 5 items), Legal Provisions (Cronbach Alpha is 0.950 with 5 items), External Factor (Cronbach Alpha is 0.964 with 3 items)

4.2 Chi-Square Analysis

In Chi-Square analysis, the variables examined are new categories in each portion of the query. As a result, there are 10 independent variables whose associations with the dependent variables are being investigated.

Table 5
Chi-Square Analysis for Indonesia and Malaysia

Variables	P-Value		Decision	
	Indonesia	Malaysia	Indonesia	Malaysia
Housing Physical Design	0.959	0.394	Not Significant	Not Significant
Home Design dan Construction	0.342	0.7890	Not Significant	Not Significant
Developer and Real Estate Products	0.821	0.074	Not Significant	Not Significant
Development Concepts	0.817	0.579	Not Significant	Not Significant
Housing Location	0.014	0.686	Significant	Not Significant
Property Funding	0.010	0.682	Significant	Not Significant
Social Status	0.653	0.682	Not Significant	Not Significant
Health	0.034	0.614	Significant	Not Significant
Law Provisions	0.638	0.555	Not Significant	Not Significant
External Factor	0.397	0.928	Not Significant	Not Significant

Table 5 shows the result of Chi-Square Analysis for Indonesia and Malaysia. The results indicated that Housing Location, Property Funding and Health have a significant effect on residential property price in Indonesia. Besides that, the results displayed that Housing Physical Design, Home Design dan Construction, Developer and Real Estate Products, Development Concepts, Housing Location, Property Funding, Social Status, Health, Law Provisions and External Factor do not affect residential property price in Malaysia. In addition, this study analyzes the combined data between Indonesia and Malaysia to examine the factors that influence residential property price. The result, as seen in Table 5 below:

Table 6
Chi-Square Analysis for Combined Data

Variables	P-Value	Conclusions
Housing Physical Design	0.754119	Not Significant
Home Design dan Construction	0.842442	Not Significant
Developer and Real Estate Products	0.330623	Not Significant
Development Concepts	0.715434	Not Significant
Housing Location	0.115707	Not Significant
Property Funding	0.017058	Significant
Social Status	0.375773	Not Significant
Health	0.505026	Not Significant
Law Provisions	0.296147	Not Significant
External Factor	0.342158	Not Significant

Table 6 displays the result of chi-square analysis using combined data between Indonesia and Malaysia. The results indicated that Property Funding has a significant effect on determining the residential property price. However, other factors, such as Housing Physical Design, Home Design dan Construction, Developer and Real Estate Products, Development Concepts, Housing Location, Social Status, Health, Law Provisions, and External Factor do not determine the residential property price

4.3 Multiple Ordinal Regression Analysis

Independent variables are variables that have a significant influence on the results of chi-square analysis. As a result, only data from Indonesian and combined data can be used to build a model. In the study, an ordinal regression model on dependent variables was established using The Highest Price Preference as a Reference Category. Property Financing will be a variable that will be included. Since the variable uses ordinal scale data, it must be split into numerous dummy variables in order to be included in the model. As a result, dummy variable column is as follow:

Table 7
Multiple Ordinal Regression Analysis Model

Variables	Dummy variables	Reference Category
Property Financing	Property Financing _2, Property Financing _3, Property Financing _4, Property Financing _5	Property Financing _1

The following model was then developed based on the analysis:

Table 8
Multiple Ordinal Regression Analysis Result

Variables	Estimate	Odds	P-Value	Decision
Constant "Lowest Price"	0.7795		0.514	No significant effect
Constant "Low Price"	0.7091		0.000	Significant effect
Constant "Medium Price"	0.4928		0.000	Significant effect
Constant "High Price"	-0.0223		0.939	No significant effect
Property Financing _1	-			
Property Financing _2	1.0391	2.82667	0.454	No significant effect
Property Financing _3,	1.7271	5.62432	0.161	No significant effect
Property Financing _4,	1.9771	7.22177	0.105	No significant effect
Property Financing _5	2.3029	10.0031	0.057	No significant effect

Using the logit regression model, Table 8 displays all independent variables that have no significant effect on it. It demonstrates that this model is still unusable because the data used is still only 234 respondent's data from a target of approximately 800 respondent data. It implies that this model will need to be rebuilt when there is an adequate amount of data.

5. Conclusion

The validity and reliability analysis reveal that all questions on the Indonesian, Malaysian, and combined data are valid and reliable. Home Location, Property Financing, and Health are factors that have a significant effect on property price preferences in Indonesian data based on chi-square analysis. There are no significant factors in Malaysian data influencing property price preferences. Property Financing is a factor that significantly affects property price preferences in the combined data, according to chi-square analysis.

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