UNIVERSITI TEKNOLOGI MARA

MATHEMATICS AND STATISTICS

UNDERGRADUATE RESEARCH PROCEEDINGS 2025

UiTM CAWANGAN NEGERI SEMBILAN

Factors Affecting Rental Prices of Residential Apartments in Kuala Lumpur

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Abstract

This study investigates the factors that affect the rental prices of residential apartments in Kuala Lumpur, Malaysia. Thus, as urbanization accelerates and housing demand rises, tenants, landlords, and governments must understand the factors that influence rental costs. Multiple linear regression analysis was used on a dataset of 1335 entries from the Kaggle platform to investigate the relationships between rental prices and six key factors which are the number of rooms, parking spaces, bathrooms, unit size, presence of security, and the location near KTM/LRT. The findings found that all the factors had a significant influence on rental prices of apartments and interestingly, only the number of rooms displayed a negative correlation with rental prices, suggesting niche market preferences. Approximately 33.4% of the total variation in rental prices was explained by the number of rooms, parking spaces, bathrooms, unit size, presence of security, and the location near KTM/LRT. In summary, this research provides useful information for stakeholders to make informed decisions about rental pricing, property investments, and housing policies. In addition, future research should broaden the geographic reach, integrate new factors, and investigate the trends market to better understand apartment rental price dynamics in Kuala Lumpur.

Keywords*:* Affecting, Apartments, Kuala Lumpur, Multiple linear regression, Rental prices

Introduction

The unique qualities of homes determined by age, style, and location are essential since the housing market is not homogeneous [7, 11]. According to [1], rent is considered to be a payment for the use of the building as well as the monthly amount paid to a landlord. Moreover, based on [8], the apartment is a Western housing style with a high population density that was imported and modified to overcome these housing problems such as urban slums and insufficient housing. Apartments are also self-contained housing units that occupy only part of the building and can be rented or purchased. In Malaysia, apartments are provided by both the public and private sectors [8]. In addition, real estate has constantly collected high demand globally, and real estate has grown to be an important sector of the economy with the ability to affect stock market fluctuations and generate unexpected economic events [6]. Apartments constitute an important portion of real estate assets worldwide, because of their amenities, affordability, security, and capacity to house large populations in limited locations, the apartments serve as a viable solution to the housing crisis [18].

Apart from that, due to the inflexible nature of properties and the increase in housing expenses, rental valuation has become increasingly significant, and estimating residential rental values is crucial [24]. However, in highly competitive real estate rental markets, it is necessary to comprehend the variables that could affect rent pricing [21]. On the other hand, residential apartments are solely constructed for domestic usage on "residential" titled land [13]. In East Asia, Malaysia has one of the highest rates of urbanization. As a result, the percentage of people living in cities increased from 26.8% in 1970 to 71% in 2010. It is anticipated that building higher-rise housing will increase the number of units, providing more accommodation and ensuring the continuation of affordable rental schemes [17]. Kuala Lumpur City Hall oversees the management of affordable public housing in Kuala Lumpur, the country's capital. In fact, of the total affordable public housing units available, 37415 units, or 60%, are for rent [10].

According to the News Strait Times, rent increases in the Klang Valley could reach 10 to 20 percent in 2024 as the impact of the COVID-19 movement restrictions fades and demand for real estate increases [25]. Additionally, in Malaysia, housing affordability has been a major problem, particularly for people who live in big cities like Kuala Lumpur and Selangor. Searching for a convenient and affordable home to rent is on everyone's bucket list. However, most people can no longer afford this "affordable housing" due to a sharp rise in house prices [2]. The rental price issue arises when the composition of the rental market consists of landlords who need rent income to pay off their mortgages, and when landlords' rent collections generally show similar upward trends [19]. Some tenants claimed they had to rent such units due to the strategic location close to public transport. Also, the cost to rent these units varies depending on the area and population density in the Klang Valley [15]. Therefore, the objective for this study is to determine the factors that affect rental prices of residential apartments in Kuala Lumpur.

This scope of the study covered several factors, such as the number of rooms, the number of bathrooms, the number of parking space availability, size, security, and proximity to KTM/LRT stations, which may affect the rental prices of residential apartments in Kuala Lumpur. Additionally, the scope of this study will be confined to Kuala Lumpur, the capital city of Malaysia, and specifically targets residential apartments. This focus is due to the high demand of staying in the apartments in the city like Kuala Lumpur. There are also a few limitations to this study. One of the limitations is the findings of this research will be specific to Kuala Lumpur, hence it might not apply to other cities in Malaysia or to different countries with different socio-economic and cultural contexts. Next, the rental market is highly dynamic, with prices fluctuating due to unforeseen factors such as economic crises or natural disasters. The awareness of factors like proximity to public transportation, security, and workplaces can significantly impact a renter's quality of life. Renters can prioritize apartments that offer the best combination of convenience and affordability.

Methodology

Source of Data

The data that has been used for this research was secondary data and the source for the data was from the Kaggle website. However, the data information was originally scraped from the Mudah website which is Malaysia's Largest Marketplace. This study examined 1,335 data points, encompassing variables such as apartment rent, number of rooms and bathrooms, parking availability, unit size, security features, and proximity to KTM/LRT stations. Table 1 below shows the details of all the variables used in this study. All of the variables, apartment rent, rooms, bathroom, parking, and size are numerical variables while, the variables of security and near KTM/LRT are categorical variables.

Table 1: Description of variables

Variable	Description	Level of measurement
Apartment rent	Apartment rent monthly in ringgit Malaysia (RM)	Ratio
Rooms	Number of bedrooms in a unit	Ratio
Bathroom	Number of bathrooms in the unit	Ratio
Parking	Number of parking spaces for the unit	Ratio
Size	Total area of the unit in square feet	Ratio
Security	Presence of security	Nominal (1 = Security, 0 = No security)
Near KTM/LRT	Apartment location near KTM or LRT station	Nominal (1 = Near KTM or LRT, 0 = Not near KTM or LRT)

Theoretical Framework

Figure 1 below shows that the theoretical framework of this study contains one dependent variable, apartment rent, and six independent variables which are rooms, bathrooms, parking, size, security, and near KTM/LRT. It also shows the relationships between the dependent variable and the independent variables.

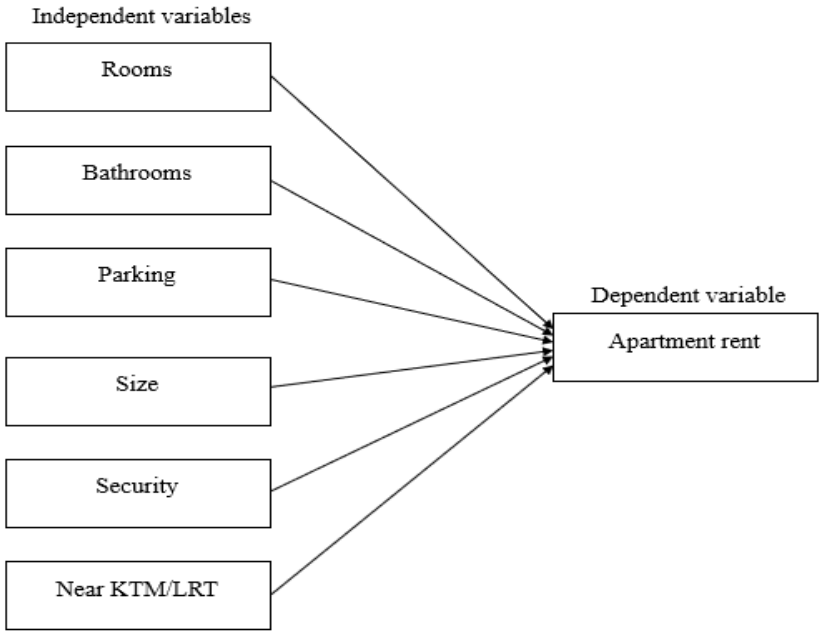

Figure 1: Theoretical Framework

Method of Analysis

Multiple linear regression expands on simple linear regression by adding more than one explanatory variable. The term "linear" is still used in both scenarios because the researchers believe that the response variable is closely related to a linear combination of the explanatory variables [20]. Meanwhile, regression analysis refers to a broad range of statistical methods [5]. Regression is particularly useful for analyzing non-experimental research, and it is frequently more appropriate or simpler to utilize multiple regression to analyze the results of complex quasi-experimental or even experimental research due to the use of dummy variables and contemporary computer software [9]. The general multiple regression model for this study:

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \varepsilon \quad (1)$$

where

Y_i is an apartment rent

X_1 is the rooms

X_2 is the parking

X_3 is the bathroom

X_4 is the size

X_5 is the security

X_6 is near KTM/LRT

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ are the parameters of the regression line

ε is the error term

Moreover, a process of transformation towards the variables must be carried out if any assumptions cannot meet the criteria. There are six assumptions which are detecting the linear relationship between each predictor variable and the dependent variables, the error terms are normally distributed, the error variances must be constant (homoscedasticity), the predictors are independent of each other (no multicollinearity), there are no outliers, and the error terms are independent (no autocorrelation) [14].

Results and Discussion

The multiple linear regression analysis was conducted to fulfil the study's objective of identifying the factors influencing residential apartment rental prices in Kuala Lumpur. Despite the removal of all outliers and influential points, the data still failed to meet the necessary assumptions. Consequently, a transformation process was required to ensure compliance with all assumptions.

Transformation of Dependent Variable

In this study, the researcher used the logarithmic transformation of variables. Logarithmically converting variables in a regression model is a frequent method for dealing with non-linear relationships between independent and dependent variables [4]. Furthermore, empirical researchers frequently find the log-transformed approach, in which the dependent variable is natural log-transformed and the unknown coefficients of the explanatory variables in the regression model are estimated using the linear least squares method [3]. After the transformation process, model adequacy checking was conducted again since a new dependent variable was used.

Table 2: Correlations Matrix between Dependent Variables and Independent Variables

		rooms	parking	bathroom	size
ln y	Pearson Correlation	0.073	0.331	0.288	0.455
	Sig.	0.011	0.000	0.000	0.000
	N	1208	1208	1208	1208

Based on table 2, all the p-values are less than the alpha value, 0.05. Hence, the linearity assumption is fulfilled. The p-value for Kolmogorov Smirnov is 0.200 which exceeds the alpha threshold of 0.05, indicating that the error terms are normally distributed. In addition, Park test were conducted to confirm that the homoscedasticity exist.

Table 3: Coefficients of Park test for Independence Variables

Independent variable	Significant Value (p-value)
Rooms	0.915
Parking	0.171
Bathroom	0.211
Size	0.188
Security	0.514
Near KTM/LRT	0.382

As for the statistical method which is the Park test as shown in table 3, all the p-values of the independent variable show that the p-values are greater than the alpha value, 0.05. Therefore, it can be concluded that homoscedasticity exist. The Durbin-Watson value of 1.841 falls within the acceptable range of 1.5 to 2.5, indicating the absence of autocorrelation and confirming the independence of the error terms. In addition, the p-value for the ANOVA, F-test (0.000) is below the alpha threshold of 0.05, indicating the statistical significance of the F-statistic. Consequently, this confirms the overall validity of the model.

Table 4: Coefficient of Independence Variables

Independent variable	Unstandardized coefficients, B	Significant value (p-value)	Tolerance	VIF
Constant	6.417	0.000	-	-
Rooms	-0.0113	0.000	0.763	1.310
Parking	0.080	0.000	0.873	1.145
Bathroom	0.090	0.000	0.712	1.404
Size	0.001	0.000	0.736	1.358
Security	0.138	0.000	0.894	1.119
Near KTM/LRT	0.036	0.009	0.979	1.021

The dataset does not exhibit multicollinearity, as all tolerance (TOL) values exceed 0.2, and all variance inflation factor (VIF) values remain below 10 as shows in table 4. In addition, all the p-values of the independent variable are less than the alpha value, 0.05. This indicates that all independent variables which are rooms, parking, bathroom, size, security, and NearKTM/LRT had a significant relationship with apartment rent. Thus, the results show that all the factors influenced the rental prices of apartments. This means that, the objective had been achieved which to determine the factors affecting rental prices of residential apartments in Kuala Lumpur.

The regression model reveals that all predictor variables, except for the number of rooms, exhibit a positive influence on apartment rent. This indicates that an increase in these predictors

is associated with higher rental prices. Conversely, the negative relationship between the number of rooms and apartment rent suggests that as the number of rooms increases, rental prices tend to decrease. The coefficient of determination, R^2 value of 0.334 implies that 33.4% of the variance in the natural log-transformed apartment rent is attributable to the predictor variables: rooms, parking, bathrooms, size, security, and proximity to KTM/LRT. The remaining 66.6% is influenced by unobserved factors beyond the model's scope. Additionally, the adjusted coefficient of determination, R^2_{adj} value of 0.330, which is marginally lower than the R^2 value, serves as a more robust metric by adjusting for the number of predictors, thereby enhancing the reliability of the model's explanatory power [23].

Conclusion and Recommendations

The analysis confirmed that the selected independent variables, namely the rooms, parking, bathrooms, size, security, and near KTM/LRT, significantly impact rental prices. Interestingly, the number of rooms was negatively correlated with rental prices. This oddity shows that the larger number of rooms in the apartment may serve a niche market or have lower demand than the smaller number of rooms, which is frequently preferred in urban areas. Additionally, apartments with additional security measures had the greatest price premiums, indicating that tenants are willing to pay extra for safety and peace of mind. Meanwhile, the bathrooms and parking moderately positively impacted rental prices. This is consistent with broader market trends that emphasize ease and comfort, as tenants desire additional facilities [16].

The factor of apartment size also demonstrated a positive effect on rental prices. Hence, larger apartments are often regarded to be more desired, yet the incremental price rise for the size of the apartment is much smaller than for other features. Although near KTM/LRT had a positive impact on rental prices, the effect was not too strong. This finding is consistent with global research that shows that the value of location decreases in locations with near KTM/LRT [12]. This research also offers a complete understanding of the factors that influence the rental prices of apartments in Kuala Lumpur. While this emphasizes the significance of the chosen variables, it also demonstrates that a significant portion of the rental price is influenced by other factors such as neighbourhood prestige, building age, or economic conditions [22].

The first recommendation is to analyze temporal trends of apartment rental prices within a year. This is because investigating variations in rental price determinants over time may show changing market preferences, as well as the impact of economic cycles or policy interventions on rental prices of apartments. Other than that, researchers may expand the region and expand the property type of high-rise buildings. Thus, a larger and more diverse region and more property type increases the possibility of detecting significant patterns and insights, improving the overall validity and it would enable policymakers and stakeholders to develop regional-specific strategies. Future research should include more variables in the research such as neighbourhood prestige, building age, proximity to facilities like hospitals, shopping malls, and schools, or other variables that are suitable for this study.

Acknowledgments

We would like to express our gratitude to the Head of College of Computing, Informatics and Mathematics for her advice and encouragement throughout the completion of this research. Besides, we would like to express our gratitude to the Research Ethics Committee, UiTM, for supporting the success of this research. This research was not funded by any grant.

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