SUPPLY PREDICTION MODEL FOR HIGH-COST MULTI-STOREY HOUSES

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-To my beloved, my precious, my soul Abah and Arwah Mak-

Ramli & Harbi

-To my dear family-

My sweetheart Mohamad Norshahir & My son Mohamad Norshakir

-To my lovely, supportive and kind supervisor-

Assoc. Prof. Dr. Rozlin Zainal

-To all my respondents-

Thank you so much. May Allah s.w.t reward you for your kindness.

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ABSTRACT

The high margin perception factor has been the cause of the development of housing projects that initially aimed to meet demand and eventually turned into the development of high-cost houses. Developing condominiums and apartments that cost more than RM300,000 excessively in Johor, Selangor and Pulau Pinang accounted for the largest number of overhang units. Therefore, this study was conducted to develop a supply predicting model for high-cost multi-story houses using micro and macro factors. A descriptive analysis was performed to identify the existence of unsold trends that occurred from 2010 to 2020 to ensure the appropriateness of the study conducted. Next, micro factors are analysed using the correlation method while macro factors are analysed using the regression method. For micro factors, a total of 61 developers opined that the factors of the developer's financial lending facilities, location, population, housing development approval by local authorities and cost of building construction influence the developer's action to oversupply the high-cost multi-storey houses. As for the macro factors, this study found that the GDP affects on houses priced between RM300,000 to RM400,000, RM600,000 to RM700,000 and RM800,000 to RM900,000. Next, the unemployment rate affects houses priced between RM300,000 to RM400,000 while the inflation rate affects houses priced between RM400,000 to RM500,000, RM700,000 to RM800,000 and above RM1,000,000. Finally, the validity test conducted on eight experts in the construction industry showed that they agree with the formation of a housing supply predicting model that uses micro and macro factors. The findings of this research are expected to be used by construction companies and public institutions that hold unsold units to improve their sales performance, not only in Malaysia but also in other Asian regions that show similar housing development patterns.

ABSTRAK

Faktor persepsi margin tinggi menjadi punca pembangunan projek perumahan yang asalnya bertujuan memenuhi permintaan akhirnya menjadi pembangunan rumah kediaman berkos tinggi. Lebihan pembangunan kondominium dan apartment yang berharga melebihi RM300,000 di Johor, Selangor dan Pulau Pinang menyumbang jumlah terbesar unit tidak terjual. Oleh itu, kajian ini dijalankan untuk membangunkan model ramalan bekalan rumah bertingkat kos tinggi menggunakan faktor mikro dan makro. Analisis deskriptif dilakukan untuk pengenalpastian kewujudan trend tidak terjual yang berlaku sepanjang 2010 hingga 2020 bagi memastikan kesesuaian kajian yang dijalankan. Seterusnya, faktor mikro dianalisis mengunakan kaedah korelasi manakala faktor makro pula dianalisis menggunakan kaedah regressi. Untuk faktor mikro, sebanyak 61 pemaju berpendapat bahawa faktor kemudahan pinjaman kewangan pemaju, lokasi, populasi, kelulusan pembangunan perumahan oleh pihak berkuasa tempatan dan pembinaan kos pembinaan mempengaruhi tindakan pemaju menawarkan lebihan bekalan rumah bertingkat tinggi. Manakala bagi faktor makro pula, KDNK memberi kesan kepada rumah yang berharga antara RM300,000 hingga RM400,000, RM600,000 hingga RM700,000 dan RM800,000 hingga RM900,000. Seterusnya, kadar pengangguran memberi kesan kepada rumah yang berharga antara RM300,000 hingga RM400,000 manakala kadar inflasi pula memberi kesan kepada rumah yang berharga antara RM400,000 hingga RM500,000, RM700,000 hingga RM800,000 dan ke atas RM1,000,000. Terakhir, ujian kesahan yang dilakukan ke atas 8 orang pakar dalam industri pembinaan menunjukkan bahawa mereka bersetuju dengan pembentukan model ramalan bekalan perumahan yang menggunakan faktor mikro dan makro. Penemuan penyelidikan ini diharapkan dapat digunakan oleh syarikat pembinaan dan institusi awam yang memegang unit tidak terjual dalam meningkatkan prestasi jualan mereka, bukan sahaja di Malaysia tetapi juga di rantau Asia lain yang menunjukkan corak pembangunan perumahan yang sama.

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LIST OF ABBREVIATIONS

APDL	Under construction but obtained Advertising Permit and Developer License
ARIMA	An Autoregressive Integrated Moving Average
BLR	Base Lending Rate
BNM	Bank Negara Malaysia
BPA	Building Plan Approval
CAGR	Compound Annual Growth Rate
CCC	Complete with Certificate of Completion and Compliance
CF	Certificate of Fitness
Covid-19	Coronavirus disease
DIBS	Developer Interest Bearing Scheme
DTCP	Department of Town and Country Planning
EPF	Employees Provident Fund
GDP	Gross Domestic Product
HCB	Housing Cost Burden
HDA	Housing Development Act
HPI	House Price Index
ICS	Interest Capitalisation Scheme
JMB	Joint Management Body
JPN	National Housing Department
KeTSA	Ministry of Energy and Natural Resources
KPKT	Ministry of Housing and Local Government
kWh	kilowatt-hours
KRI	Khazanah Research Institute
MBJB	Johor Bahru City Council
MBPJ	Petaling Jaya City Council

MC	Management Corporation
MITR	Mortgage Interest Tax Relief
NEAC	National Economic Action Council
REHDA	Real Estate and Housing Developer's Associates
RI	Residual Income
RISM	Royal Malaysian Institute of Surveyors
RPGT	Real Property Gains Tax
SPA	Sale and Purchase Agreement
TCF	Temporary Certificate of Fitness
TNB	Tenaga Nasional Berhad
UPESM	Unsold Property Enquiry System Malaysia
	Valuation and Property Services Department Malaysia
WHO	World Health Organization

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CHAPTER 1

INTRODUCTION

1.1 Research Background

The challenging housing market condition due to the growing pile of overhang and oversupply units has been in the limelight in the press and has become a regular debate by government planning and property players. Simply speaking, overhang (or unsold units) is a cyclical problem due mainly to the unmet housing demand associated with the varying economic performance, housing preferences, market sentiment, and credit accessibility (Hassan *et al.*, 2018; Jamaluddin *et al.*, 2016). Property oversupply, on the other hand, is a structural problem where the number of houses is more than the number of households as a result of a failure to comply with the housing planning policy, guidelines, and other determinations as contained in the development plans (Musa *et al.*, 2015; Maimun *et al.*, 2018).

The involvement of private developers began with the provision of housing for low-income groups around 1986 and eventually continued until now when they were involved in the construction of *Perumahan Rakyat Mampu Milik* (PRMM) and also the implementation of houses for middle-income groups (National Housing Department (JPN), 2019). Although project monitoring is carried out by the Ministry of Housing and Local Government (KPKT), the problem of housing supply imbalance against demand still occurs (Shuid, 2015). For example, in the Eleventh Malaysia Plan (RMK11), the construction of houses for low and medium-income households is only 420,000 units compared to the original goal of 606,000 units (Economic Planning Unit (EPU), 2015).

Based on Figure 1.1, as of 2020, developers had added 210,969 units of supply regardless of a large amount of overhang recorded since 2016 (226,011 units). In addition, there are about 45,762 units of the multi-storey houses supply, equivalent to a 48% increase during 2017 compared to 2016. Not only that, for the years 2018, 2019 and 2020, each recorded a 49% (69,189 units), 25% (52,472 units) and 17% (43,546 units) increase in supply for every year. However, compared to landed houses, the increase in supply from 2017 until 2020 only involved about 91,316 units, even though the total overhang numbers reported for 2018 until 2020 successfully showed a decrease in the number and percentage.

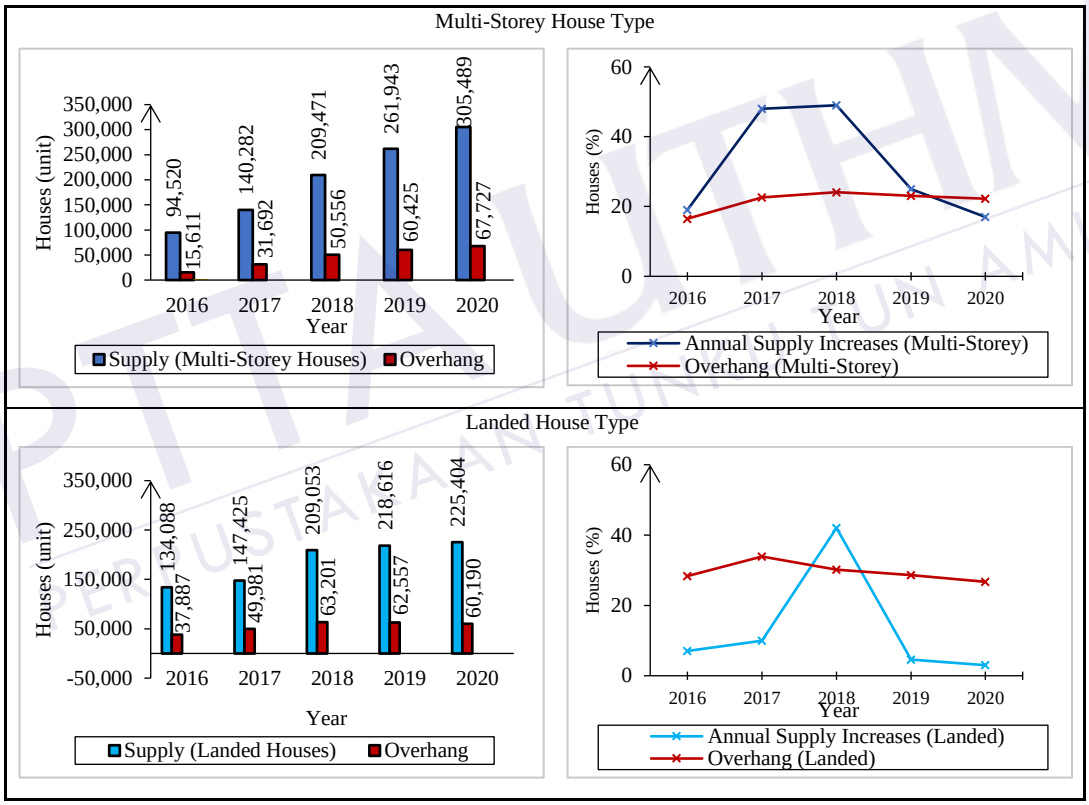

Figure 1.1: Total Overhang Units for Landed and Multi-Storey Housing (Author's calculation; UPESM, 2016a until 2016h; UPESM, 2017a until 2017h; UPESM, 2018a until 2018h; UPESM, 2019a until 2019h; UPESM, 2020a until 2020h)

In Malaysia, the oversupply of flats and low-cost apartments only exists under the categories of less than RM200,000. Based on Figure 1.2, almost the entire supply of unsold houses recorded throughout 2016 to 2020 is caused by the condominium and

apartment categories. Based on the statistics, the price category of RM200,000 to RM300,000 ranked at the top for the record of overhang (43,672 units) and supply (146,404). By states, based on Figure 1.3, Kuala Lumpur recorded the lowest percentage of overhang at 15% despite recording the highest number of house supply at 240,825 units. Meanwhile, Johor, with the lowest supply of multi-storey houses at 104,156 units, ranks first for the record number of overhangs throughout the year.

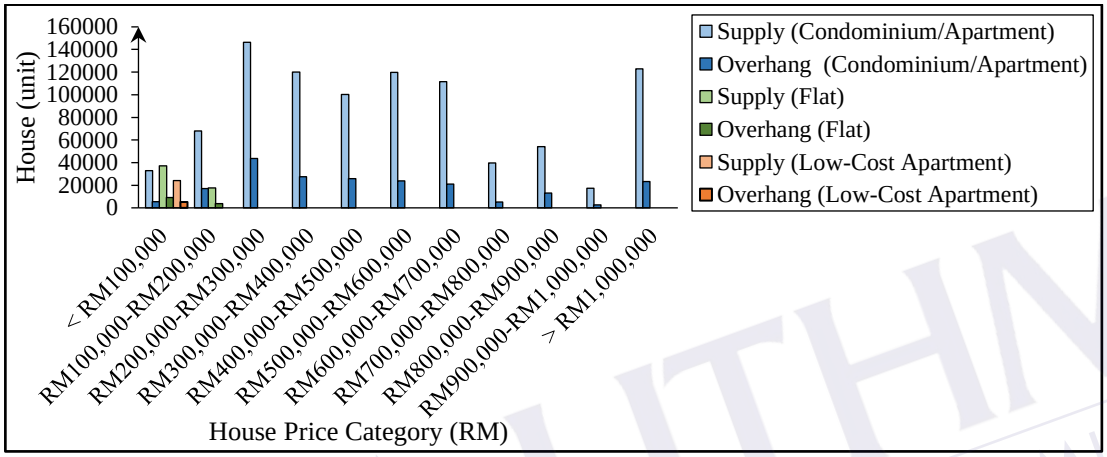

Figure 1.2: Total Supply and Overhang Units for Multi-Storey Housing (Author's calculation; UPESM, 2016a until 2016h; UPESM, 2017a until 2017h; UPESM, 2018a until 2018h; UPESM, 2019a until 2019h; UPESM, 2020a until 2020h)

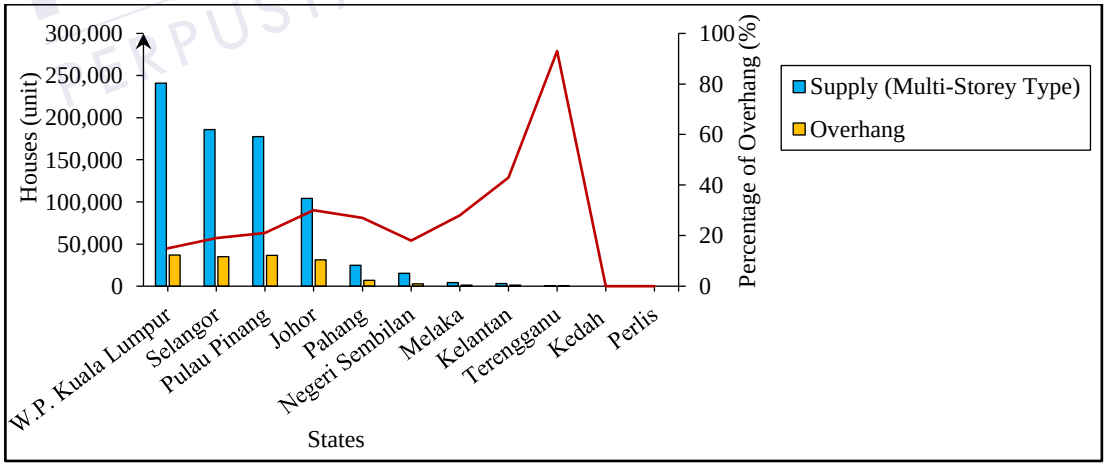

Figure 1.3: Total Overhang Housing Units by States in Malaysia (Author's calculation; UPESM, 2016a until 2016h; UPESM, 2017a until 2017h; UPESM, 2018a until 2018h; UPESM, 2019a until 2019h; UPESM, 2020a until 2020h)

Overall, developers are more interested in developing the house category priced above RM200,000, thus recording the highest excess supply during the five years. Referring to the method of calculating the median multiple by REHDA (2019), the average house price that is said to be affordable for all states in Malaysia except for Kuala Lumpur and Selangor is below the price of RM200,000. Therefore, the house category chosen as a limitation of the study is starting with a price of RM300,000 instead of RM200,000 because it considers the categorisation of affordable house prices.

In order to overcome the problem of overhang, this study found that some developers provide free gifts to attract buyers to buy a house with them (Kaur, 2016). Some developers also provide interest-free instalment plans for buyers who cannot afford to provide a home down payment (Wong, 2017). Apart from that, it was found that the developer also offered a loan of 88% of the property value to potential buyers who failed to obtain a loan from the local bank (Cheah, 2016). Next, they also introduced a payment scheme of 5% of the house price for the process of moving into the house immediately (Cheng, 2016).

A study conducted by Yeap & Lean (2020) proved that the housing supply could be controlled when there are measures to overcome the oversupply challenge by reducing approvals for housing development projects by the authorities. The existence of an inverted U-shaped housing supply curve in Malaysia indicates that there is a non-linear relationship between housing supply and house prices. Therefore, this study needs to evaluate the responsiveness of factors leading to the oversupply of housing, the production process and government policy toward determining the high-cost housing supply. Further to those, this research also highlights the current issues of unsold from the oversupply of housing experienced in the Malaysian housing industry.

1.2 Problem Statement

The housing industry in Malaysia, in general, has been in the limelight mainly due to a lack of supply of affordable houses offered by private developers. According to the international comparison of the market's housing affordability in 2019, Malaysia is ranked seventh out of eight countries identified as having an unaffordable housing market (KRI, 2021a). Reports done by the Khazanah Research Institute (KRI) regarding the overhang of high-cost housing in Malaysia, found that most developers do not parallel the feasibility studies made on local housing demand and only focus on a project that can give multiple profits only (KRI, 2021b).

Specifically in the high-cost housing market, one of the current aims of providing the house is to meet the high demand from foreigners besides buyers with high purchasing power. However, the latest findings from the previous study regarding Malaysian high-cost housing are incongruent with this aim. Hasni *et al.* (2021) found that the enforcement of the minimum house purchase limit by foreigners to RM 1 million implemented in 2015 had caused the increment supply of houses priced above RM500,000. In particular, the study found that the developers are not worried when the percentage of housing unit sales does not reach 100% as they are still able to make a huge margin even if the sales performance only reaches 50% (Hasni *et al.*, 2021).

In addition to the oversupply of high-cost houses reported by Hasni *et al.* (2021), the study by Bakeri *et al.* (2017) revealed that the increase in the supply of high-cost houses compared to other types of housing is due to the increase in the price of basic building materials such as stone, sand, cement and iron and also the price of land. Therefore, the construction of high-cost houses can give the developer a multifold profit even after including all the construction costs in the price of the house. Apart from that, Bakeri *et al.* (2017) also found that by developing high-cost housing, developers can attract buyers by providing modern concept housing features equipped with various infrastructure, green features, and spacious house size so that buyers feel it is worth the price offered.

From the perspective of supplying, a recent study by Yeap & Lean (2020) successfully proved that the housing supply could change in the presence of government intervention. In Malaysia, to ensure the stability of national property values, the government seem to have introduced several incentives to attract buyers to buy houses. However, without being unmonitored by local authorities, developers took

advantage of manipulating these incentives by developing many houses within the listed price range to receive incentives (Yeap & Lean, 2020). These views are consistent with those of Mukhtar *et al.* (2017) when they claimed that the approval process at the Local Planning Authorities and State Authorities, which focus on the technical requirements without considering the actual demand, also contributes to the issue of overhang and oversupply.

A sharp increase in the number of overhang housing units in our country not only caused a heavy burden on national and social expenditures but also caused the construction companies to have slow progress on new projects and a rise in debt and financial expenses (Poovenraj, 2020). Failed housing developers to generate income through the housing industry cause the progress reports of various projects in the construction phase to be unimpressive and may lead to abandoned projects (Yoo & Yoon, 2021). As a result, the default risk of construction companies results in economic losses to stakeholders and a large burden on the country's finances, as it is linked to the risk of default of financial institutions.

In addition, according to Choi *et al.* (2013), the housing overhang problem negatively impacts the nearby housing market. The actions of developers whom lower housing prices to increase sales percentage cause dissatisfaction among most residents who bought equivalent units at a higher price before (Poovenraj, 2020). Not only that, but the overhang problem is also linked to a low occupancy rate that indirectly invites residents' concerns with the frequency of crime cases in the area, besides causing long weeds to grow and become a habitat for wildlife and a breeding ground for mosquitoes (Mohamad, 2018).

Collectively, despite examining the factors affecting the oversupply of housing, none of the studies has developed a prediction model for that issue. The model of supply prediction developed by Ali (1998) was only focused on Malaysian shophouses; meanwhile, Zainun *et al.* (2016) developed an Autoregressive Integrated Moving Average (ARIMA) model to predict the demand for low-cost housing in Malaysia. Among both models, Ali (1998) uses factors such as rental price, vacancy rate, number of houses and construction cost, whereas Zainun *et al.* (2016) use time-series data. Accordingly, to develop a supply forecast model, this study examines the impact of micro and macro factors on developers involved in the oversupply of high-cost multi-storey houses.

1.3 Research Hypothesis

A research hypothesis proposes the relationship between an independent variable and a dependent variable. According to Lavrakas (2008), the dependent variable's effect is influenced by what happens when the independent variable is changed. Thus, to predict the future multi-storey housing supply, this study divides the micro factor into three main parts, which area, the increasing house price factor (H_a until H_c), internal factor (H_d until H_f) and construction cost factor (H_g until H_i), whereas the macro factor is divided into three hypotheses, which are, the factor of Gross Domestic Product (H_j), the factor of the unemployment rate (H_k) and factor of inflation rate (H_l). In total, all nine micro factors (H_a until H_i) listed are used as independent variables toward the oversupply of high-cost multi-storey housing besides are used to support the formation of a regression model. On the other hand, all three macro factors (H_j until H_l) are used in developing eight regression models of supply prediction. Figure 1.4 illustrates the simple framework showing the independent variables (H_a until H_l) and their relation to the dependent variables.

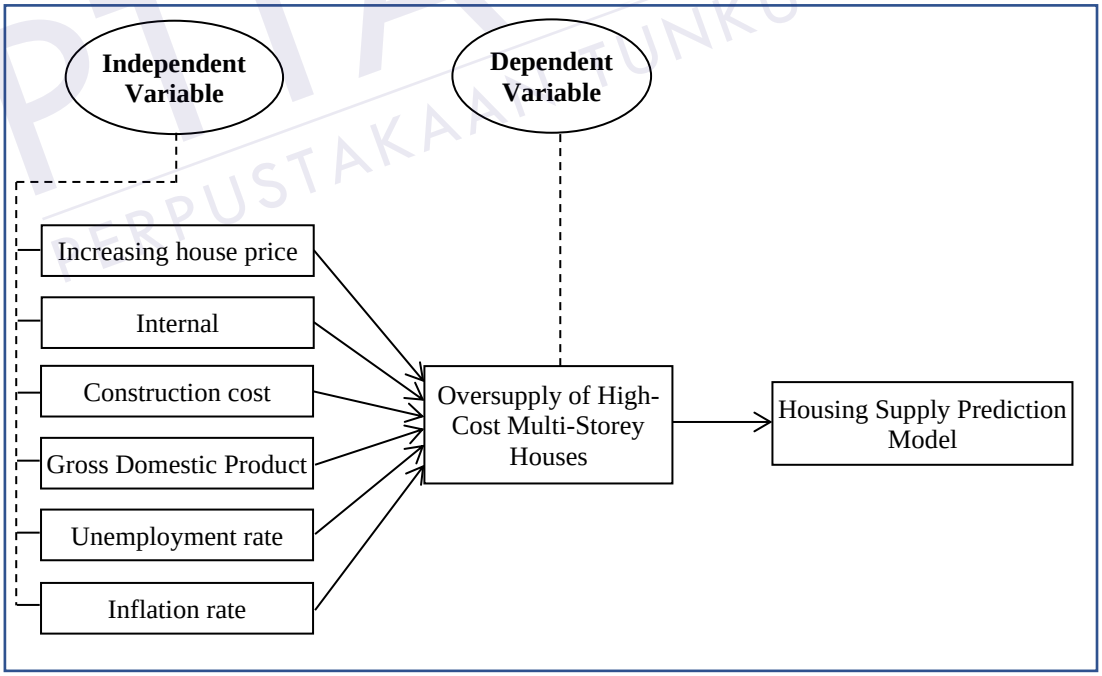

Figure 1.4: Independent and Dependent Variables of The Study

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