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Analysis of Residential Property Demand Factors in 34 Provinces Period 2019 – 2021

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A B S T R A C T

This research aims to determine the influence of property price variables, regional income (GRDP), population and facilities (regional access and infrastructure) on demand for residential property in 34 provinces in Indonesia. This research uses panel data obtained from the Badan Pusat Statistik (BPS) and Bank Indonesia (BI) websites in 34 provinces for the 2019-2021 period. This research has the limitation of only focusing on 4 control variables including price, GRDP, population and facilities only. So, it does not involve other external variables except these four variables. The statistical model used is panel data regression analysis with a fixed effect model along with hypothesis testing using the F test and t test. The results of the F test show that the independent variables (property prices, regional income (GRDP), population and facilities index) have a significant effect on demand for residential property in 34 provinces in Indonesia. Apart from that, the t test results show that the property price and facility variables partially have a significant effect on Indonesian property demand, while the regional income (GRDP) and population variables do not have a significant effect on Indonesian property demand. The recommendations through this research are conveyed to the government and developers so that they can work together to provide property at more affordable prices supported by adequate public facilities. There is a need for more in-depth research initiated by all regional governments and involving developers regarding the development of a repayment system that is good and effective, but can be reached by all middle to lower income communities. Apart from that, each provincial government is obliged to consistently improve the welfare of its people to the maximum. So, people's purchasing power is able to support property purchases.

Keywords: *Property Demand, Price, GRDP, Population, Facilities*
JEL Classification Code: *R2,R21,R3,R31*

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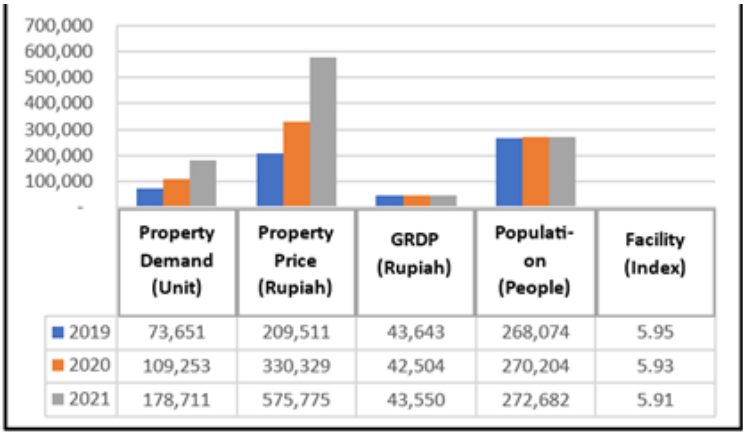
INTRODUCTION

Housing and property are assets that cannot be separated from basic human needs. In the past, humans did not attach importance to settling in one area and chose to be nomads, because humans generally still did primitive things such as hunting and migrating to areas where there was potentially an abundant food supply. As time progresses and the progress of human civilization, which can now be interpreted as population, the dimension of the word "nomadic" changes to "sedentary", this is because people generally settle in an area and have a shelter which functions to protect themselves from all unwanted things. as well as other dangers and threats. People who are increasingly aware of the importance of housing needs can increase demand for housing and property in an area. The long-term viability of the family as a place to gather, spend time together has always been correlated with the value of the home and property. Apart from that, the motives and goals of owning a house have evolved from initially just being a shelter to meeting the owner's needs and preferences, but also having to be comfortable to live in, such as a strategic location, a sturdy building, and a comfortable environment (Goodman and Thibodeau 1998; Situmorang 2018).

The strategic function of housing is to act as a center for basic family learning in improving the quality of future generations (Widyastuti, 2013). Improving the quality of life is a reflection of community welfare and skilled human resources. Therefore, the government must consider current preferences and capacities to ensure the survival of its people. Likewise, when the government is deemed unable to provide people with access to housing, accompanied by the government's inability to provide security guarantees, political and economic instability will occur which will hamper welfare and social growth. (Haslinda, 2019). The importance of housing makes it one of the most regulated assets, taxed and subsidized by the state. Apart from that, housing market failures often occur, so government intervention is needed, so that market failures can be analyzed and resolved properly. Housing market failure occurs because society in general always demands to own property with adequate environment, facilities, access and public services. Meanwhile, not all housing developers prioritize this.

Housing demand plays an important role in influencing the market value of property. This is because the supply of land for development is limited in terms of area, but in terms of demand it is always changing and



	Property Demand (Unit)	Property Price (Rupiah)	GRDP (Rupiah)	Population (People)	Facility (Index)
2019	73,651	209,511	43,643	268,074	5.95
2020	109,253	330,329	42,504	270,204	5.93
2021	178,711	575,775	43,550	272,682	5.91

Sources: Badan Pusat Statistik and Bank Indonesia

Figure 1.
Property Demand and Control Variables

increasing. Firdaus (1997) explains that demand for housing is influenced by factors including public facilities and facilities, location, population growth, income, ease of funding, market price of housing and consumer tastes as well as statutory regulations. The following is a graph that shows the development of property demand as well as various factors that can be used as control variables in this research.

Based on the graph above, there is a business phenomenon that is able to describe a condition where GRDP experiences stagnation, but property prices continue to increase along with the increase in the number of units demanded. The increase in demand for property units was also triggered by population growth in 34 Indonesian provinces (Badan Pusat Statistik dan Bank Indonesia, 2021). Then, based on this business phenomenon, it can be used as a reference regarding the problems in this research. The variable demand for residential property is a proxy for the number of realized residential property units in 34 provinces of Indonesia. Demand for residential property increased from 2019, 2020 and 2021 in the order of 73,651 units, 109,253 units and 178,771 units respectively. Furthermore, the average price of residential property realized in 34 provinces also increased from year to year in the respective order, including, 209,511 (million rupiah), 330,329 (million rupiah), 575,775 (million rupiah). However, the average GRDP of 34 Indonesian provinces experienced stagnation from 2019 to 2021 with the respective orders including, 43,643 (million rupiah), 42,504 (million rupiah), 43,550 (million rupiah). Furthermore, Indonesia's population continues to increase from year to year with the respective orders including, 268,074 (million people), 270,204 (million people), 272,682 (million people). Meanwhile, the average facility index for 34 provinces in Indonesia experienced stagnation from 2019 to 2021 with the respective orders including, 5.95 points, 5.93 points, 5.91 points. After knowing the business phenomenon and presenting a graph showing the condition of housing demand and the control variables that are thought to influence it. Then, we will discuss the basic theory of various control variables and their relationship to housing demand.

Price is the amount that a customer or buyer must pay for an item (Robert B Lamb 2001). Price is the most customizable component. In addition, if a company has a cost advantage compared to its competitors, then the company can set a low price policy. Likewise, marketing executives' primary concerns are pricing and price competition. However, many businesses have difficulty determining prices. When wanting to buy a house, consumers must compare the purchase cost with various other property references by considering various facilities, surrounding environment, location, and costs incurred (Chi-Man, 2011; Zandi, 2015; Zhang, 2012). Apart from that, developers now provide a variety of residential options with various facilities and benefits. So, buyers can calculate the price of the house depending on the segmentation that is adjusted to the price, the affordability of the price for the targeted segmentation, adjusting the costs to the benefits of the desired house, and the suitability of the costs to the desired level of housing quality (Azizah, 2019 ; Wijayanto and Armandani, 2020).

Increasing property and housing prices will certainly be difficult to accommodate for the income of every region of Indonesian society which is considered to have stagnant growth. The factors causing the increase in housing and property prices are driven by the completeness of access and public facilities in an area (Edwards 2011; Tomkins, 1998; Yang, 2019). Housing and property prices are an amount in the form of money paid when people buy a house/property unit. Considering that housing is an immovable asset and is

limited in nature. So, based on the law of demand and supply, the higher the units of goods demanded, the higher the price offered (Romer 2012). This means that soaring property prices can reflect increasing demand for property (Bramley 1993; Osland and Thorsen 2008). Observations regarding the impact of prices on property demand have been carried out by a number of researchers. Marpaung (2011) ; Mahardini and Woyanti (2012) ; Widyastuti and Handayani (2013) ; Suryawardana and Yani (2017) ; Situmorang (2018) ; Azizah (2019) ; Jumriyanor and Rusdianysah (2020) ; Wijayanto and Armandani (2020) found that price has a significant effect on property demand. Meanwhile, research conducted by Haslinda (2019) gives results that price does not have a significant effect on property demand.

Consumption expenditure is almost completely influenced by income power. The consumption function according to Keynes shows the relationship between national income and consumption expenditure, both of which are expressed using a constant price level and not the relationship between nominal national income and nominal consumption (Todaro and Smith, 2013). In economics, income is remuneration for the use of production factors owned by the household sector and the corporate sector in the form of salary/wages, rent, interest and profit/profit (Najib, Bado and Imam, 2019). Income can be measured on a per capita basis which is obtained from dividing a country's national income by the country's population in a certain period. Meanwhile, Gross Regional Domestic Income (GRDP) is per capita income based on each province in Indonesia. Per capita income can be used to compare the welfare or standard of living of a country from year to year. By making such comparisons, we can observe whether the average welfare of the people in a country has increased (Todaro and Smith, 2013). Income is one of the important factors that influences demand, which essentially states that the higher the income, the greater the demand for the item. Conversely, the lower the income, the less demand for the good (Sukirno 2010). The size of a person's income influences a person's purchasing power, including when buying a house. This is supported by Firdaus (1997) which states, if a person's income increases and economic conditions do not experience recession and inflation, the tendency to own a house will increase both in quality and quantity.

The higher the people's income in each region (GRDP), the greater the people's ability to buy housing units and property (Chiwuzie, 2019; Duja, 2019). Thus, it is able to encourage an increase in the number of requests (Dengah, 2014; Siagian, 2017; Najib, 2019). However, there could be the opposite potential, increasing regional income could spur an increase in the amount of consumption for daily household needs (Arsyad 2010; Bloom 2004; Samuelson and Nordhaus 2004). Meanwhile, increasing housing and property prices can encourage people to rent a place to live and not have to own property. This means that increasing income has no effect on demand for property units (Haslinda 2019). Furthermore, research on the impact of income on property demand has been carried out by a number of researchers. Dengah, Rumate and Niode (2014) ; Siagian (2017) ; Situmorang (2018) ; Azizah (2019) ; Najib, Bado and Imam (2019) ; Putri, Safuridar and Andini (2023) revealed that income has a significant effect on property demand. Different from the results of research conducted by Haslinda (2019) ; Sari (2020) which explains that income does not have a significant effect on property demand.

Demand for housing and settlements is related to population and household dynamics which include growth, distribution, population mobility and household development (Bloom 2004; Teddy and

Kelana 2001). The population aspect is the basis for formulating all development policies and is also the object of development (Buchanan and Weber 1982; Dyason 2020). Urban population development often exceeds the national population growth rate and urban population growth is uneven. Apart from that, there are areas where urban population growth is very high, but there are also urban areas where the population has decreased. On the other hand, housing and settlements can be instruments to achieve a goal of regional or city development and can also be the development goal itself (Arjulita 2014). Economists explain the role of population in economic growth. There are differences in population growth rates between developed and developing countries. Usually in developed countries population growth is lower compared to developing countries (Todaro and Smith, 2013). Besides that, Malthus argued that humans need basic needs for life, while the rate of growth of basic needs is much slower than the rate of population growth. If there are no restrictions on population growth, humans will experience deprivation, destitution and poverty (Todaro and Smith, 2013).

Demand for housing is influenced by three main factors, namely population and demographics, income and tastes and lifestyle (Arjulita 2014). There is a reason that everyone needs a place to live as a place of refuge, so every increase in population, both natural and non-natural (due to urbanization) will increase the demand for houses (Firdaus 1997). The high population growth rate coupled with high urbanization has resulted in increasing housing problems and will cause the need for physical buildings to increase (Bloch 1997; Dengah, Rumate, and Niode 2014; Essafi and Simon 2015). Research on the impact of population on property demand has been carried out by a number of researchers. Najib, Bado and Imam (2019) ; Sari (2020) ; Putri, Safuridar and Andini (2023) revealed that population has a significant effect on property demand. Meanwhile, research conducted by Arjulita (2014) ; Dengah, Rumate and Niode (2014) gives results that population does not have a significant effect on property demand.

Apart from the increasing human population factor, there are public and social facility factors that are important in influencing consumers' interest in buying property. The facilities in question include infrastructure, health, educational and religious institutions as well as transportation and other facilities. There is a housing theory that the closer you are to the city center, the more expensive house prices and rents are (Tomkins, 1998; Groot, 2011; Zeiss, 1999). As a result, only rich people can be located in the city center, while middle to lower income people can only occupy areas on the outskirts of the city (Marpaung, 2011; Todaro and Smith, 2013). On the other hand, this is within their capabilities, but they have to bear transportation costs and take longer to travel to the city center which is a place of economic activity with various service facilities(Adisasmita 2011; Kodoatie 2005; Stiglitz 2000). This phenomenon is a housing paradox that occurs in developing countries which deviates from the theory that as income increases, more people will live in the suburbs (Marpaung, 2011; Todaro and Smith, 2013). Disamping itu, Firdaus (1997) explains that demand for housing is influenced by factors including public facilities and facilities, location, population growth, income, ease of funding, market price of housing and consumer tastes as well as statutory regulations.

Firdaus (1997) stated that location factors can influence the demand for a house, it was stated that location has a positive influence on the demand for a house. The better and more strategic a house is located, the more demand for that property tends to increase. Apart from that, it was also stated that there were in-

frastructure/facility factors that were important in influencing the demand for a house (Debrezion, 2011; Firdaus 1997; Liu and Shi 2017; Torre, 2015). There is a positive relationship between facilities and demand for housing, meaning that the better the implementation of infrastructure, the greater the demand for housing by individuals (Mahardini and Woyanti 2012). Furthermore, the function of housing will become more apparent the more complex the facilities provided by the developer (Widyastuti and Handayani, 2013). Observations regarding the impact of facilities on property demand have been carried out by a number of researchers Marpaung (2011) ; Mahardini and Woyanti (2012) ; Widyastuti and Handayani (2013) ; Suryawardana and Yani (2017) ; Azizah (2019) ; Jumriyanor and Rusdianysah (2020) ; Wijayanto and Armandani (2020) ; Mislinawati, Kadriyani and Husaini (2023) found that facilities have a significant effect on property demand. Meanwhile, research conducted by Sihotang (2018) gives results that facilities do not have a significant effect on property demand.

The reason for choosing the variables unit price, GRDP, population and facilities as explained previously is because based on theoretical studies from various studies that have been mentioned, they are proven to support the theoretical basis which projects these control variables to have an influence on property demand. This research aims to determine the extent to which control variables influence demand for residential property in Indonesia as well as providing an academic contribution by looking at the influence of each control variable on demand for property units. It can be used as a reference for other authors who wish to develop and explore further similar research. So, through the approach of property prices, regional income (GRDP), population and fluctuating facility index, this research focuses on the title “Analysis of Residential Property Demand Factors in 34 Provinces Period 2019 - 2021”.

METHODOLOGY

The selection of this model is based on the use of the natural logarithm (ln) model, because there are differences in the units and magnitudes of the independent variables. Choosing a natural logarithm model can avoid heteroscedasticity and can also determine the coefficients that indicate elasticity (Ghozali 2014; Gujarati 2012). Apart from that, the use of natural logarithms also serves to bring the data scale closer (Ghozali 2014). So, the empirical model in this research can be obtained as follows:

$$ln\_PPRO_{it} = \beta_0 + \beta_1 ln\_HPR_{it} + \beta_2 ln\_PDRB_{it} + \beta_3 ln\_POP_{it} + \beta_4 ln\_FAS_{it} + \eta_{it}$$

The operational definition of variables in this research includes five main variables. First, Residential Property Demand ($PPRO_{it}$) is a form of proxy for the realization of the number of residential property units in 34 Indonesian Provinces. Second, property prices (HPR_{it}) is the amount in the form of money that must be paid when people buy a house/property unit. Third, Regional Income (PDRBit) is income measured per capita based on each province in Indonesia in a certain period. Fourth, population (POP_{it}) are residents who live in the territory of the Republic of Indonesia for six months or more, as well as those who live in the territory of the Republic of Indonesia for a shorter time but plan to stay. Lastly, infrastructure and access facilities (FAS_{it}) is infrastructure and access to support daily community activities which are assessed in each province in Indonesia. This operational definition provides an understanding of the variables used in research and how they are measured and defined.

This research uses a panel data structure to estimate the impact of prop-

erty prices, GRDP, population and facilities (infrastructure and access) on property demand in 34 provinces in Indonesia for the 2019–2021 period. The use of panel data in quantitative research is because it is able to increase the efficiency of estimation results and makes it possible to overcome the issue of endogeneity of research variables. The use of panel data is basically a solution to the unavailability of long enough time series data for econometric analysis purposes. Panel data can provide researchers with a large number of observations, increase degrees of freedom, data has large variability and reduces collinearity between explanatory variables so that it can produce efficient econometrics (Gujarati 2012). When cross section and time series data are compared, panel data is more informative and varied. In addition, panel data can provide better solutions in inferring dynamic changes than cross section data (Ghozali 2014).

The type of data used in this research is secondary data which has been processed into panel data, which is a combination of time-series data for the period 2019 to 2021 with cross-section data in 34 provinces in Indonesia. So, each variable consisting of the dependent variable and control variable consists of N=102. As for the selection of sample objects, the majority of property demand growth was experienced by these 34 provinces. The following are details of the data sources for the variables used in this research along with a list of provinces used as research samples.

Panel data regression does not rule out the possibility of using several methods to obtain the best estimation results. The general procedure carried out in panel data regression based on equations is estimated using the Common Effect Model (CEM), Fixed Effect Model (FEM) and Random Effect Model (REM), then a series of tests are carried out such as the Hausman test, Chow test and Lagrange multiplier test to obtain the best model among FEM, CEM or REM (Gujarati 2012). The Common Effect Model is the simplest estimation technique for panel data. This technique only combines time series data with cross sections without paying attention to differences in components between individuals and

Table 1.
Variables, Data Sources and Units of Measure

Variables	Data Sources	UOM	Note
Property Demand ($PPRO_{it}$)	BI	Unit	LN
Property Price (HPR_{it})	BPS	Rupiah	LN
Regional Income ($PDRB_{it}$)	BPS	Rupiah	LN
Population (POP_{it})	BPS	People	LN
Facility (FAS_{it})	BPS	Index	LN
Provinces:	Aceh, Bali, Banten, Bengkulu, D.I. Yogyakarta, Dki Jakarta, Gorontalo, Jambi, Jawa Barat, Jawa Tengah, Jawa Timur, Kalimantan Barat, Kalimantan Selatan, Kalimantan Tengah, Kalimantan Timur, Kalimantan Utara, Kep.Babel, Kepulauan Riau, Lampung, Maluku, Maluku Utara, Nusa Tenggara Barat, Nusa Tenggara Timur, Papua, Papua Barat, Riau, Sulawesi Barat, Sulawesi Selatan, Sulawesi Tengah, Sulawesi Tenggara, Sulawesi Utara, Sumatera Barat, Sumatera Selatan, Sumatera Utara.		

Sources: Badan Pusat Statistik and Bank Indonesia

time. The Common Effect Model assumes that the intercept and slope coefficient are considered constant both over time (time series) and between individuals (cross section) with the approach used being the Ordinary Least Square (OLS) method as the estimation technique. However, this method is said to be unrealistic because in its use the same intercept value is often obtained so it is not efficient to use in every estimation model, therefore a data panel was created to make it easier to interpret (Ghozali 2014).

The Fixed Effect Model is an estimation model that considers individual heterogeneity in the explanatory variable. Heterogeneity is captured through the intercept difference for each individual. This model assumes different intercepts between individuals (cross section) but has a constant (fixed) regression slope over time (time series). To estimate panel data, the Fixed Effect Model uses the Least Square Dummy Variable (LSDV) technique. Apart from overcoming endogeneity problems, it is also able to capture macroeconomic effects (Shepherd 2016). The advantage of this method is that it can differentiate individual effects and time effects and this method requires the assumption that the error component is not correlated with the independent variable (Ghozali 2014). Random effect model is a method that will estimate panel data where disturbance variables may be interconnected over time and between individuals (Ghozali 2014). In this model, the intercept is looked at by the error term of each individual and it is assumed that the error term will always exist and may be correlated throughout the time series and cross section. To estimate this model using the Generalize Least Square (GLS) method (Ghozali 2014).

After determining the best regression model, the classical assumption test is then carried out to obtain an unbiased and consistent model (Best Linear Unbiased Estimator). The first classical assumption test is the multicollinearity test to find out whether in the regression model there is a strong correlation between the independent variables. The multicollinearity test can be seen if the correlation value is < 0.80, then there is no multicollinearity problem (Gujarati 2012). Next, a heteroscedasticity test is carried out to check whether the regression model contains unequal residual variances. A regression model with heteroscedasticity has the consequence that the OLS estimator is not BLUE because it no longer has minimum variance. The heteroscedasticity test using the Breusch-Pagan method can be carried out provided that if the P-value shown by Prob > chi2 has a value > 0.05, then there is no heteroscedasticity (Gujarati 2012). Finally, an autocorrelation test was carried out to assess the correlation between the disturbance variables of one observation and another observation in the regression model. The autocorrelation test can use the Durbin-Watson (DW) test which requires an intercept (constant) in the regression model and no lag variables between the independent variables (Ghozali 2014). If the decision making is du ≤ d ≤ 4-du, then it is concluded that there is no autocorrelation.

RESULTS AND DISCUSSION

How to determine the best estimate from the existing model will be tested using the Chow Test and Hausman Test. The Chow test aims to determine whether CEM or FEM is more appropriate to use in regression analysis. After carrying out the Chow-Test, then test the model through the Hausman-Test to find out whether FEM or REM is more appropriate to use in estimating the model, the results of the Chow Test and Hausman Test are in table 2.

The chi square probability value is 0.000 < 0.05 so that FEM is preferred over CEM. Next, a Hausman-Test was carried out to obtain a random probability value of < 0.05 so that it was concluded that FEM

Table 2.
Chow and Hausman Test

Estimation Test	Cross-Section	Prob.	Note
Chow	Chi-square	0.0000	FEM
Hausman	Random	0.0250	FEM

Sources: Research Result, Processed Data, 2023

Table 3.
Multicollinearity, Heteroscedasticity and Autocorrelation Test

Estimation Test						
Multicollinearity					Heteroscedasticity	Autocorrelation
	LN_HPR	LN_PDRB	LN_POP	LN_FAS	Prob.	DW Stat.
LN_HPR	1.000000	-0.02441	0.521213	-0.01867	0.7272	2.006656
LN_PDRB	-0.02441	1.000000	-0.01346	0.439892	0.2996	
LN_POP	0.521213	-0.01346	1.000000	0.227437	0.4209	
LN_FAS	-0.01867	0.439892	0.227437	1.000000	0.916	

Sources: Research Result, Processed Data, 2023

was the best model estimated. After knowing the best model to estimate, a series of classical assumption tests are carried out. The results of the classical assumption tests in table 3.

Based on the results above, there is no correlation between independent variables that exceeds 0.80. So the model in this research is free from multicollinearity problems. Then, by testing heteroscedasticity using the Breusch-Pagan method, the probability values for all independent variables were > 0.05, so it was concluded that the model was free from heteroscedasticity problems. Finally, the Durbin Watson (DW) value was obtained at 2.006656, at the significance level (α) 5% The Durbin Watson Upper (DU) value obtained is 1,7596. Then the results are obtained 1,7596 < 2,006656 < 2,24040 , Thus it can be concluded that the model is free from autocorrelation problems. After passing a series of classical assumption tests, hypothesis testing is then carried out.

The accuracy of the regression model in estimating actual values can be measured through the coefficient of determination (Adjusted R2), F test and t test (partial test) (Ghozali 2014). Next, an explanation of the results of using the feasibility test tool for the F test model and goodness of fit (Adjusted R^2), The results in table 4.

The Adjusted R-Squared value is 0.997108, meaning the variation of the Residential Property Demand variable ($PPRO_{it}$) can be explained by the Residential Property Price variable (HPR_{it}), PDRB ($PDRB_{it}$), Population (POP_{it}), Facility (FAS_{it}) amounting to 99.7108% while the remaining 0.2892% is explained by other factors outside the model. Meanwhile, the F-statistic probability value of 0.0000 is lower than 0.05, which indicates that the Residential Property Price variable (HPR_{it}), PDRB ($PDRB_{it}$), Population (POP_{it}), Facility (FAS_{it}) together they have a significant effect on Residential Property Demand ($PPRO_{it}$). So, the first hypothesis (H1 = Accepted). Next, an analysis is carried out based on the FEM regression that has been obtained in table 5.

Based on the results above, a regression model estimate is obtained which explains the ability of the independent variable to predict the dependent variable. Here's the model:

Table 4.
Adjusted R2 and F Test

Root MSE	0.059019	R-squared	0.998167
Mean dependent var	7.435984	Adjusted R-squared	0.997108
S.D. dependent var	1.385452	S.E. of regression	0.074508
Akaike info criterion	-2.076812	Sum squared resid	0.355292
Schwarz criterion	-1.098881	Log likelihood	143.9174
Hannan-Quinn criter.	-1.680814	F-statistic	942.1061
Durbin-Watson stat	2.006656	Prob(F-statistic)	0.000000

Source: Research Result, Processed Data, 2023

Table 5.
Fixed-Effect Method Regression Estimation Results

Variable	Coefficient	t-Statistic	Prob.	Hypothetical Decisions
C	-8.669370	-1.56272	0.1230	
LN_HPR	0.976664	97.88416	0.0000	H2 Accepted
LN_PDRB	-0.013273	-0.04455	0.9646	H3 Rejected
LN_POP	0.316291	0.937472	0.3520	H4 Rejected
LN_FAS	1.005355	2.968749	0.0042	H5 Accepted

Source: Research Result, Processed Data, 2023

$$ln\_PPRO_{it} = -8{,}669370 + 0{,}976664\ ln\_HPR_{it} - 0{,}013273\ ln\_PDRB_{it} + 0{,}316291\ ln\_POP_{it} + 1{,}005355\ ln\_FAS_{it} + \eta_{it}$$

The regression results show a constant value of -8.669370, meaning that the Residential Property Price (HPRit), PDRB ($PDRB_{it}$), Population (POP_{it}), Facility (FAS_{it}) is considered constant or has a value of 0, then the amount of Residential Property Demand ($PPRO_{it}$) decreased by 8,669370 or 9 (unit).

First, the influence of Residential Property Prices (HPR_{it}) on Residential Property Demand ($PPRO_{it}$) seen based on the probability that the t-statistic output is 0.000, it is lower than the significance level of 0.05, it can be concluded that Residential Property Prices (HPRit) significant effect on Residential Property Demand ($PPRO_{it}$). The results of this research are in line with previous research studies conducted by Marpaung (2011) ; Mahardini and Woyanti (2012); Widyastuti and Handayani (2013); Suryawardana and Yani (2017); Situmorang (2018); Azizah (2019); Jumriyanor and Rusdianysah (2020); Wijayanto and Armandani (2020), Fik (2003); Donald (2002); Jim and Chen (2006) states that Property Prices have a significant effect on Property Demand. So, the second hypothesis (H2 = Accepted).

Residential Property Price regression coefficient (HPR_{it}) amounting to 0,976664, shows when Residential Property Prices (HPR_{it}) raise 1%, while the GRDP variable ($PDRB_{it}$), population (POP_{it}), Facility (FAS_{it}) is zero, then the Residential Property Demand variable value ($PPRO_{it}$) will increase by 0.976664, so that the Residential Property Demand variable ($PPRO_{it}$) will increase -7,692706 (-8,669370 + 0,976664). Partial testing shows that an increase in property prices can affect property demand, the more property prices increase, the greater the increase in residential property demand in 34 provinces in Indonesia for the 2019 - 2021 period.

Most people choose relatively cheap house prices as their main consideration, this proves that house prices are the main thing in their residence prefer-

ences (Marpaung 2011). Another reality also proves that when choosing housing, consumers pay attention to the location of the housing, because most consumers who choose housing want to live in an area or location that is comfortable and does not pose risks such as flooding and air pollution (Marpaung 2011). Based on the results of the regression analysis and t test, it can be seen that price has a positive and significant effect on demand for houses. This result is contrary to the law of demand, because the price of houses in housing is relatively cheap for the lower middle class. So, if prices increase but the increase is still within the limits of affordability for middle to lower income people, they still have hope that if house prices do have to rise but this needs to be balanced with improvements in infrastructure, so that it is commensurate with the costs that have been sacrificed and convince consumers to be interested in buying house (Marpaung, 2011; Mahardini and Woyanti, 2012; Suryawardana and Yani, 2017; Azizah, 2019). Therefore, the results of this study do not support that house prices have a negative influence on demand for houses and also the law of demand which states that the lower the price of a good, the greater the demand for it (Mahardini and Woyanti, 2012; Suryawardana and Yani, 2017; Azizah, 2019). Apart from that, increasing property prices became a phenomenon in the United States in 2008 which shook the global economy. This is due to the Property Bubble effect which is caused by people who already own a house, but have the desire to buy a second house and so on. This causes property prices to increase sharply beyond their fundamental prices (Fanama and Pratikto, 2019).

Second, the influence of GRDP ($PDRB_{it}$) on Residential Property Demand ($PPRO_{it}$) seen based on the probability that the t-statistic output is 0.9646, which is higher than the significance level of 0.05, it can be concluded that GRDP ($PDRB_{it}$) has no significant and negative effect on Residential Property Demand ($PPRO_{it}$). The results of this research are in line with previous research conducted by Haslinda (2019) ; Sari (2020) which explains that income does not have a significant effect on property demand. So, the third hypothesis (H3 = Rejected).

GRDP regression coefficient ($PDRB_{it}$) amounting to -0,013273, shows when GRDP ($PDRB_{it}$) raise 1%, while the Residential Property Price variable (HPRit), Population (POP_{it}), Facility (FAS_{it}) is zero, then the Residential Property Demand variable value ($PPRO_{it}$) will decrease by 0,013273, so that the Residential Property Demand variable (PPROit) will decrease to -8.68264 (-8,669370 - 0,013273). This means that increasing regional income has no effect on increasing demand for property, but rather has a very small impact on decreasing demand for residential property in 34 provinces in Indonesia for the 2019 - 2021 period.

The average income of people is equivalent to the regional minimum wage. The problem that arises for people with this income is that the amount of salary is less likely to be set aside for housing savings. This amount of income is predominantly used to meet people's daily needs and lifestyle. Apart from that, land prices are very expensive and this has resulted in marginalization of access to new housing (Amrozi, 2022). In terms of access to cheap housing with a KPR scheme, people still experience obstacles. To access Public Housing Credit (KPR) you need an income above the average regional minimum wage per month, this is a problem for people whose income is in accordance with the UMR (Amrozi, 2022). Apart from that, the increase in property prices every year is always influenced by macroeconomic factors related to broad economic phenomena that can affect households, companies and markets simultaneously (Mankiw 2018). So, people are more domi-

nant in fulfilling basic needs in the form of clothing and food which are relatively easy to obtain and fulfill, but this is different with basic needs in the form of shelter because of the high prices of property in the form of land and houses which are not commensurate with the average income earned by the community. This means that the increasing increase in people's income cannot have a significant influence on property demand. Considering that people prioritize the need to maintain life through food and clothing, the costs of which are increasingly expensive every year. Thus, the relationship between income and demand for property shows a negative value in the income variable coefficient, this will result in a decrease in house purchases (Haslinda 2019).

Third, the influence of population (POP_{it}) on Residential Property Demand ($PPRO_{it}$) seen based on the probability of the t-statistic output being 0.3520, higher than the significance level of 0.05, it can be concluded that the Population (POP_{it}) has no significant effect on Residential Property Demand (PPROit). The results of this research are in line with previous research studies conducted by Arjulita (2014) ; Dengah, Rumate and Niode (2014) stated that population size does not have a significant effect on property demand. Partial testing shows that the increase in population cannot affect Property Demand. So, the fourth hypothesis (H4 = Rejected).

Population Number regression coefficient (POP_{it}) amounting to 0,316291, shows when the Population Number (POP_{it}) raise 1%, while the Residential Property Price variable (HPR_{it}), PDRB ($PDRB_{it}$), Facility (FAS_{it}) is zero, then the Residential Property Demand variable value ($PPRO_{it}$) will increase by 0.316291, so that the Residential Property Demand variable ($PPRO_{it}$) will increase -8,35308 (-8,669370 + 0,316291). This means that the increasing population has no effect on demand for property, but rather has a very small impact on increasing demand for residential property in 34 provinces in Indonesia for the 2019 - 2021 period.

Referring to the results of the regression equation in this research, this is not in line with the theory put forward in literature reviews and other researchers that one of the factors that influences housing demand is population growth. Demand for housing and settlements is related to population and household dynamics which include growth, distribution, population mobility and household development (Arjulita 2014). Population growth has an insignificant relationship to housing demand, a population that increases every year does not necessarily encourage the creation of new settlements. Therefore, what local governments need to do in utilizing and developing areas in the form of land management is expected to be based on the principles of benefit, justice and equity, togetherness, kinship, establishing and enabling, creating a climate of convenience and affordability as well as various roles in sustainable, just development (Arjulita 2014). Evidence of a lack of seriousness in implementing these principles is in line with research conducted by Dengah, Rumate and Niode (2014), The insignificance of the research results regarding the influence of population on increasing demand for housing can be explained by the property ownership status which is influenced by residents who live outside the research area and are included in the research variables. So it can be correlated with this research, that the increase in property in 34 provinces of Indonesia is likely to be influenced by property ownership by residents who are not domiciled as Indonesian citizens, although in this case the population of Indonesia is getting denser but it does not contribute to the increase in demand for property.

Lastly, the influence of Facilities (FAS_{it}) on Residential Property Demand ($PPRO_{it}$) seen based on the probability of

the t-statistic output being 0.0042, lower than the significance level of 0.05, it can be concluded that the Facilities (FAS_{it}) significant effect on Residential Property Demand ($PPRO_{it}$). These results are in line with previous research conducted by Marpaung (2011); Mahardini and Woyanti (2012); Widyastuti and Handayani (2013); Suryawardana and Yani (2017); Azizah (2019); Jumriyanor and Rusdianysah (2020); Wijayanto and Armandani (2020); Mislinawati, Kadriyani and Husaini (2023) who found that facilities have a significant effect on property demand. So, the fifth hypothesis (H5 = Accepted).

Facilities regression coefficient (FAS_{it}) amounting to 1,005355, shows when the Facility (FAS_{it}) raise 1%, while the Residential Property Price variable (HPR_{it}), PDRB ($PDRB_{it}$), Population (POP_{it}) is zero, then the Residential Property Demand variable value ($PPRO_{it}$) will increase by 1.005355, so that the Residential Property Demand variable ($PPRO_{it}$) will increase -7.66402 (-8,669370 + 1,005355). Partial testing shows that an increase in infrastructure facilities and access can affect property demand, the more infrastructure facilities and access increase, the greater the increase in demand for residential property in 34 provinces in Indonesia for the 2019 - 2021 period.

Based on the regression results in this research, it is in line with the theory put forward in the literature review and other researchers that one of the factors that influences housing demand is the availability of infrastructure facilities and access. Most people consider choosing housing based on the facilities provided by the developer, the facilities provided include electricity, parking space, clean water, guaranteed security and comfort (Marpaung, 2011; Mahardini and Woyanti, 2012). Apart from this, the cleanliness factor must be designed to be sufficiently available to increase people's preferences for living in the housing, but most housing developers have not really adjusted the price of the house provided with the facilities provided (Marpaung 2011). This indicates that the completeness of the facilities provided should be commensurate with the costs incurred by consumers to purchase property (Mahardini and Woyanti, 2012). People really consider the facilities provided by developers because they have purchasing power and a variety of choices to meet their housing needs, therefore as time goes by developers should offer more and more variations of better facilities to make it easier for consumers to meet their daily needs, especially in improving existing housing facilities to make them more useful for consumers (Mahardini and Woyanti, 2012; Azizah, 2019). In line with this, Suryawardana and Yani, (2017) and Mislinawati, Kadriyani and Husaini (2023) states that the changes that occur in purchasing decisions run in the same direction as changes in facilities, if the facility variable increases it will automatically be followed by an increase in the purchasing decision variable.

Robustness Test

This test aims to prove that the regression model in this research is robust and capable of providing a robust interpretation of the results. This test uses regression analysis based on robust least squares and then compares it with the results of the FEM regression test on Eviews v.12. Robust least squares refers to various types of regression methods that are less sensitive to outliers, this test is very useful if there is too much deviation in data so it is useful for overcoming deviation problems in regression (Ghozali 2014). Robust Least Square and FEM test measurement results in table 6.

Based on the results of robust least squares which were compared with FEM-PLS regression in estimating this research model, it was found that there were similar direction coefficients for each variable. Apart from that, there are similarities in the

Table 6.
Comparison of RLS Regression and FEM Regression

Robust Least Squares Regression				Panel Least Squares Regression			
	Coefficient	Prob.	Adj. R2		Coefficient	Prob.	Adj. R2
C	-4.80236	0.00000	0.842431	C	-8.66937	0.12300	0.997108
LN_HPR	0.99115	0.00000		LN_HPR	0.97666	0.00000	
LN_PDRB	-0.02386	0.18380		LN_PDRB	-0.01327	0.96460	
LN_POP	0.01587	0.13290		LN_POP	0.31629	0.35200	
LN_FAS	0.21725	0.00350		LN_FAS	1.00536	0.00420	

Source: Research Result, Processed Data, 2023

conditions of variables that have a probability below 5%, including, Residential Property Prices (HPRit) and Facilities (FASit). Besides that, there is a slight difference in adjusted R2 between the RLS and FEM-PLS methods with each value above 70%. So, it can be concluded that there are similarities in the results obtained between the RLS and FEM-PLS methods, The estimation model in this research is robust.

CONCLUSIONS

The research model uses the FEM test and passes the classical assumption tests of multicollinearity, heteroscedasticity and autocorrelation, while the normality test It is not mandatory because the FEM method has been selected for the PLS approach. The F-statistic probability of 0.0000 is lower than 0.05 or 5%, which indicates that the Residential Property Price variable ($HPRO1_{it}$), GRDP ($PDRB2_{it}$), Population ($POP3_{it}$), Facility ($FAS4_{it}$) together they have a significant effect on Residential Property Demand ($PPRO_{it}$).

The recommendations through this research are conveyed to the government and developers so that they can work together to provide property at more affordable prices supported by adequate public facilities. The index of infrastructure facilities and access in Indonesia has stagnated, while people want to own a house with adequate facilities. Thus, this provides an opportunity to increase demand for residential property if the local government and the developers involved insist on improving the quality and completeness of infrastructure facilities and public access. There is a need for more in-depth research initiated by all regional governments and involving developers regarding the development of a repayment system that is good and effective, but can be reached by all middle to lower income communities. Apart from that, each provincial government is obliged to consistently improve the welfare of its people to the maximum. So, people's purchasing power is able to support property purchases. Then, people are given access to own a house through a subsidy program from the government. However, strict regulations are needed to regulate subsidized housing ownership so that it is right on target and only owned by people who need it more, so that it cannot be used by upper class economic groups.

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