WHAT FACTORS CAN AFFECT INDONESIAN PROPERTY PRICE?

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Abstract

This study analyses the factors that influence property prices in Indonesia using secondary data from 2008QIII to 2021QII and the Ordinary Least Square (OLS) analysis technique. The study re-sults show that inflation and lending rates have a negative and significant effect on property prices. Economic growth has a positive but insignificant effect, while exchange rates and Loan to Value (LTV) have a positive and significant effect on property prices. The findings suggest that LTV can be used as a tool to control credit growth. An increase in LTV ratio accelerates property credit growth, while a decrease in LTV ratio can slow down credit growth. The recommendation of this study is for the monetary authority to ensure the right time to implement LTV policy in Indonesia.

Keywords:*asset prices; financial and monetary policy; loan to value; time series analysis*

INTRODUCTION

In Indonesia, the real estate industry has generally demonstrated resilience and progress, buoyed by the nation's expanding economy and the burgeoning middle class. The government has been enacting a range of measures to invigorate the property sector and enhance the accessibility of housing for the populace. Nonetheless, challenges such as imbalanced development between ur-ban and rural areas, restricted access to financing, and intricate regulatory frameworks have im-pacted the dynamics of the property market across different regions of Indonesia. The essential requirements for every individual do not merely include clothing and food, but also encompass shelter as a fundamental necessity. In contemporary times, a home serves not only as a basic need but has evolved into an investment option and a gauge of social standing within society (Ngoc & Nguyen, 2024). As time goes by, human needs for housing are increasing because of the increasing number of people and reduce of land to build a house. In the end, house prices also begin to increase. This situation finally makes it difficult for people to buy a house as a place to live, especially for low-income society. But for those with low-income levels, there is another way that can be used so that the need for having a house can still be fulfilled. That way is by seeking for loans to financial institutions such as bank to apply for credit. Through this way, people no need to afraid for buying a house just because of not having large amount of money.

Every country has its different growth of housing loans. In the United States, housing loan began to show an increase since the 2000s due to low interest rates. This low interest rate finally encouraged many people to apply for credits to banks and made the housing sector boom (Ryan-Collins, 2021). This condition is also supported by the enthusiasm of mortgage lenders who pro-vide loans to many high-risk customers or customers whose economic capacity is below standard. This high-risk mortgage called subprime mortgage (K. Li & van Rijn, 2024). In the end, the per-centage of subprime mortgages that initially only 10 percent rose to 20 percent of the total of all types of bank loans for the period 2001 to 2006. Low interest rates and bank carelessness in providing credit, finally pushing property prices continue to rise even considered unnatural be-cause it is too high (property price bubble) (Szumilo, 2021). In the end, the U.S. economy is in decline and people's ability to repay the funds they have borrowed is hampered. Credit perfor-mance also deteriorated resulting in bad loans (Bank Indonesia, 2016). The next thing that hap-pened was that the bank was forced to sell the house they had seized. The number of houses sold by this bank ultimately has an impact on house prices which have decreased (Fanama & Pratikto, 2019). This situation also causes many people to experience losses due to house prices that are suddenly assessed too low.

The economic crisis that occurred in the United States in 2008 was called the most severe cri-sis that has occurred in the last 80 years according to world economists and even earned the nick-name as the mother of crisis (Greenwood et al., 2021). This is evidenced by the spread of the im-pact of the crisis to various countries in the world, including Indonesia. It was noted that at that time, housing sales in Indonesia dropped dramatically due to the increase in interest rates com-pared to before the crisis occurred (Samad et al., 2020). As times goes by, the number of people in Indonesia continues to increase. This increasing population has caused the amount of land con-tinue to decrease but housing demand increasing (Duja & Supriyanto, 2019). This increasing of property prices can be seen from the Residential Property Price Survey (SHPR) which published quarterly by Bank Indonesia.

The movement of property prices in Indonesia itself can be influenced by several factors, such as economic growth, inflation, loan interest rates, exchange rates, and policies that aim to regulate credit growth called Loan to Value (LTV) policies. The increase in property prices is re-lated to the economy, which is reflected in economic growth increased (Batayneh & Al-Malki, 2022). High economic growth indicates that public welfare in a country is also high which is re-flected in rising incomes (Fanama & Pratikto, 2019). Through this increase in income, the purchas-ing power to buy a house will increase and house prices will also increase (Duja & Supriyanto, 2019). In contrast, inflation will cause people's purchasing power to fall so that it will also have an impact on property prices (Hafizah Ismail & Nayan, 2021). As for the determination of low inter-est rates, the burden of society to return the money they have borrowed is reduced (Domanban, 2024). This condition will encourage demand and property prices to increase. Rising exchange rates or depreciation cause the cost of raw materials to become more expensive (Barson et al., 2023). This forces developers to reduce the number of houses they build. As a result, there is an imbalance between demand and supply, which encourages house prices to increase (Miles, 2019). Finally, the instability of property prices can be controlled through a policy called the Loan to Value (LTV) policy (Armstrong et al., 2019). LTV is a policy that regulates the amount of credit that can be given by the bank to its customers at the time of initial credit application. The goal is that rapid credit growth can be prevented so that it will avoid credit risk (Morgan et al., 2019). This is due to credit risk, which is the result of the customer's failure to pay in fulfilling its obliga-tions, including as one type of systemic risk. So, if it is not addressed with the right policy, then the impact that will be caused will not only attack the financial sector, but also the economy.

The implementation of the LTV policy is aimed at ensuring that credit growth remains at a manageable level, thereby preventing the emergence of a price bubble or asset valuations that de-viate from their true worth (Fanama & Pratikto, 2019). In essence, the enforcement of the LTV ratio is anticipated to curb credit expansion in Indonesia, subsequently impacting the demand for residential properties and, ultimately, the prices of residential properties in the country. Moreover, the experiences of numerous nations, characterized by sudden and abnormal surges in property prices followed by notable slowdowns or declines, underscore the significant role played by the property market in the broader economy (Haryani & Wibowo, 2020). Consequently, any instabil-ity within the property sector could potentially trigger financial instability, thereby leading to se-vere ramifications for the overall economy (Duffie, 2019).

Such occurrences have prompted various countries to ponder numerous questions and harbor con-cerns, indicating the potential recurrence of similar crises. However, the precise timing, location, and extent of these events remain uncertain. Thus, there exists a pressing necessity for research to comprehend the trajectory of property prices in Indonesia. This research will contribute to under-standing the subject in two significant ways. Firstly, it will emphasize the LTV policy's role in averting the rapid escalation of credit risks, as witnessed in 2008. Lastly, this research will aid in determining the appropriate policies required to prevent housing prices from soaring excessively by analyzing the factors proven to influence property prices in Indonesia.

METHODS

The data used in this study is quarterly data for the period 2008QIII to 2021QII. This research uses residential property price index which has been calculated by simple chain index method by Bank Indonesia team as the dependent variable. Then for the independent variable, this study used economic growth data in the form of percent calculated based on GDP constant prices from Indonesian Central Bureau of Statistics, monthly inflation in the form of percent from Bank In-donesia, loan interest rate from Financial Authority Service, IDR/USD exchange rate from the Ministry of trade, and LTV, both in the form of a dummy, where 0 for before the existence of LTV in Indonesia, namely in this study from 2008QIII-2012QII and 1 for after the existence of LTV in Indonesia, namely for the period 2012QIII-2021QII, or in the form of percent whose value has been set by Bank Indonesia. The data was collected from Bank Indonesia, the Central Statistics Agency (BPS), and the World Bank.

The analysis technique employed was the ordinary least squares (OLS) method, aiming to as-sess the extent to which each independent variable influences the dependent variable. Further-more, the methodology underwent comprehensive testing, including assessments for normality, multicollinearity, heteroskedasticity, and autocorrelation. Moreover, in addition to the OLS ap-proach, this research will incorporate the interaction of a dummy variable with the LTV ratio, which serves as the primary focus of the study's variables. This interaction aims to reinforce

the findings obtained from the preceding regression (robustness check) by multiplying the values of the dummy variables and the predetermined LTV ratios established by Bank Indonesia. There-fore, this study will use a statistic software tool called Econometric Views (Eviews) version 9 on windows with the form of model equations as follows:

$$IHPR_t = \alpha_t + \beta_1\,Growth_t + \beta_2\,INF_t + \beta_3\,IR_t + \beta_4\,ER_t + \beta_5\,DummyLTV_t + \varepsilon_t \quad ....(1)$$
$$IHPR_t = \alpha_t + \beta_1\,Growth_t + \beta_2\,INF_t + \beta_3\,IR_t + \beta_4\,ER_t + \beta_5\,DummyInteraction_t + \varepsilon_t \quad ....(2)$$

Variable Residential property price index (IHPR) shows the value of the residential property price index, variable INF shows inflation, variable IR states the interest rate and variable EX states the exchange rate. Loan to value shows the application of the LTV policy where it is 0 be-fore the LTV policy and 1 after the LTV policy. The interaction dummy shows the interaction re-sults between the LTV dummy and the LTV ratio.

RESULTS

Based on the classical assumption test that has been done, such as normality test, heteroskedastic-ity test, autocorrelation test, and multicollinearity test, it can be concluded that the model used in this study has been relevant or in other words, there is no classical assumption problem in this model. As for the multiple linear regression analysis data that has been done, it can be seen in the Table 1.

Table 1. Summary of Estimate Regression Model

Variable	Coefficient	t-Statistic
C	165.2219	10.73189
Growth	0.417680	0.677704
Inf	-1.331516	-3.330534
Ir	-5.853996	-6.722372
Er	0.007123	12.12665
DummyLTV	12.49019	4.176813
R-squared	0.972130	
Classical Assumptions Test		
Test	Statistic Test	Prob
Normality	3.604437	0.164933
Heteroskedasticity	0.471841	0.7953
Serial correlation test	1.355378	0.2684
Multicolinearity	-	Centered VIF<10

Source: Data Processed, 2022

Based on the results above, the following regression equation can be formed:

$$IHPR = 165.2219 + 0.417680\,Growth - 1.331516\,INF - 5.853996\,IR + 0.007123\,ER + 12.49019\,DummyLTV \;...(3)$$

The regression equation for before and after the LTV according to the results obtained above are as follows:

$$Before:\ IHPR = 165.2219 + 0.417680\,Growth - 1.331516\,INF - 5.853996\,IR + 0.007123\,ER\ ......(4)$$
$$After:\ IHPR = 177.71209 + 0.417680\,Growth - 1.331516\,INF - 5.853996\,IR + 0.007123\,ER\ ......(5)$$

Based on the Table 1, it can be concluded that the variables of inflation, loan interest rates, exchange rates, and dummy LTV significantly affect property prices because the probability value of each variable obtained from the regression results showed a value less than its signifi-cance level that is $\alpha = 5$ percent. On the other hand, economic growth variable in this study is not significance because the probability value obtained for this variable exceeds the significance level of 5 percent. The estimation results also concluded that the independent variables in these studies simultaneously can affect property price in a significance level at 5 percent. This result also sup-ported by the coefficient of determination or R^2 obtained by 0.972130. This number means that the independent variable can affect property prices as a dependent variable of 97.21 percent.

To test whether the regression results that have been obtained before having been appropriate, it is necessary to do a robust test. Robustness test in this study itself will interact dummy varia-bles where 0 before the LTV implemented in Indonesia and 1 after the LTV implemented in Indonesia with the ratio of LTV whose value has been set by Bank In-donesia, by multiplying the two variables. The type of LTV ratio that will be used is the average value of the first facility property loan (KP I) consisting of tread houses, flats, and shop houses for all sizes of houses, both small, medium, and large. Here are the results for robustness tests (Table 2).

After passing the classical assumption test for this model II, then based on the robustness test re-sults above, the regression results obtained in this model are the same as the regression results ob-tained in the previous model. Even the LTV variables that have been interacted with remain sig-nificantly influential in a positive direction such as the results obtained for the LTV dummy in the previous regression model. Briefly, this robustness check reinforces the results of the previous re-gression model which concluded that LTV policies have been shown to affect property prices in Indonesia in a positive and significant way.

Table 2. Robustness Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	193.2258	15.49086	12.47353	0.0000
Growth	0.525192	0.622597	0.843550	0.4033
Inf	0.022416	0.452764	0.049510	0.9607
Ir	-7.138273	0.777372	-9.182566	0.0000
Er	0.005625	0.000859	6.545350	0.0000
DummyInteractions	0.193286	0.048226	4.007937	0.0002

Source: Data Processed, 2022

DISCUSSIONS

The upward trajectory of property prices in Indonesia, evident in the residential property price in-dex spanning from 2008 to 2021, maintains an enduring positive trend, steadily increasing year after year. This persistent surge in property values is primarily driven by the persistent surge in demand for homeownership, juxtaposed with limited housing supply owing to land scarcity. On the demand side, the surge in public demand for housing is influenced by various factors, includ-ing economic growth, inflation, loan interest rates, exchange rates, and government policies im-plemented by relevant authorities, particularly the Loan to Value (LTV) policy aimed at control-ling rapid credit expansion. The regression findings from this study highlight the significant im-pact of inflation, loan interest rates, exchange rates, and the LTV policy on shaping property pric-es in Indonesia.

The research findings are corroborated by income theory, which posits that an increase in in-come augments individuals' purchasing power, enabling them to meet their living needs by con-suming a broader array of goods and services, including housing. In essence, as people's incomes rise, the heightened demand for residential properties as dwellings amplifies, consequently driv-ing an upward surge in property prices (N. Li et al., 2022). This relationship is also supported by previous research, such as that of (Sun et al., 2024) and (Afsheen, 2023), both of which indicate a positive correlation between economic growth and property prices. Nevertheless, while economic growth may positively impact property prices, the influence might not be notably significant. This is evidenced by the relatively modest role or contribution of the property sector to Indonesia's GDP. Specifically, the combined contribution of the construction sector and real estate sector to the GDP stood at 13.43 percent in 2019, 13.38 percent in 2020, and 13.31 percent in 2021. The limited role played by the property sector in the context of Indonesia's GDP suggests that despite an increase in income, only a fraction of the population opts to allocate their earnings towards property investments. Consequently, it can be deduced that while economic growth has ascend-ed, the growth of property prices in Indonesia might not experience a profoundly significant up-surge, given the diverse array of sectors toward which people direct their income.

The negative relationship observed between the inflation variable and property prices demon-strates that high inflation rates can influence a decrease in property prices due to the decline in purchasing power among the public. This is because high inflation can lead to a decrease in real income among the populace, even if their actual income remains unchanged or stagnant. The sub-sequent increase in the prices of goods compels consumers to prioritize their essential needs or choose which necessities to fulfill first. In other words, consumers are compelled to prioritize meeting their basic needs for clothing and food before considering housing needs. Consequently, the purchasing power of the public to invest in properties diminishes, leading to a decrease in de-mand for properties, which consequently impacts property prices, causing them to decline as well. Previous research, such as the studies conducted by (Nworah et al., 2023) and (Chirsty et al., 2021), has also identified a significant and negative regression relationship between the inflation variable and property prices.

Loan interest rates are also proven to affect property prices in Indonesia in a negatively and significant way. This result is in accordance with the classical interest rate theory which states that people will be more interested in keeping their money in the bank rather than using that money for consumption and investment. It's because when interest rates increase, the money which should be returned to the bank will be higher. This situation caused the distribution of property loans to fall due to demand which also fell and then effect on property prices which also decreased. This result is also supported by several studies that have been done before, namely research conducted by (Lee & Park, 2022), dan (Chen et al., 2022).

Exchange rates can also affect property prices in Indonesia in a positive and significant. These results can also also be found in some similar previous studies such as the study conducted in Kenya by (Njoroge et al., 2019) as well as research from (Pinjaman & Kogid, 2020). The ex-change rate of Rupiah/USD which has increased or depreciated will cause the cost of raw materi-al production be more expensive. This condition also forces developers to reduce the number of houses they build to still make a profit. But on the other hand, the demand for housing itself has not changed. This imbalance between demand and supply eventually causes property prices to in-crease.

The LTV policy, which is the primary focus of this study, has been proven to significantly and positively influence property prices in Indonesia, in line with the theories and assumptions utilized in this research. If the LTV ratio increases, the property prices are expected to rise by 12.49019. This is because with an increase in the LTV ratio, for instance, from the initial 70 per-cent to 80 percent, customers or individuals seeking credit facilities from banks can acquire the largest possible funds, up to 80 percent of the total house price they intend to purchase. This rise in the LTV ratio, or the increased funds they can obtain when applying for credit, leads to an in-crease in the demand for houses (Taufik & Soesilo, 2021). Conversely, if the LTV ratio initially set by the relevant authorities at 70 percent decreases to 60 percent, the demand will decrease due to the reduced funds or capital available for home purchases through loan facilities from banks.

Bank Indonesia, as the relevant authority, typically raises the LTV ratio when the economy is perceived to be slowing down. Consequently, with the increase in the LTV ratio or the implemen-tation of a lenient LTV system, it is expected to revitalize the weakening property credit growth. Conversely, Bank Indonesia would implement a stringent LTV system if the economic conditions were deemed to be overheating, by lowering the LTV ratio. The aim is to prevent the decline in property credit growth resulting from a decrease in demand (Taufik & Soesilo, 2021). This situa-tion has been evident since the implementation of the LTV policy in Indonesia. Based on the pre-viously calculated equation, property prices in Indonesia, after the introduction of LTV, from 2012QIII to 2021QII, have been higher compared to the period before the LTV policy, from 2008QIII to 2012QII. This is due to the increase in the LTV ratio, leading to an increase in de-mand for houses and subsequently causing an escalation in property prices. This condition is fur-ther reinforced by the robustness test, indicating that the LTV indeed positively influences prop-erty prices in Indonesia. In short, the LTV policy has proven to be an effective tool in controlling property demand to prevent property prices from growing too rapidly and even to avert the occur-rence of a price bubble in Indonesia.

The research findings on the significant and positive impact of the LTV, tested through a dummy, on property prices are also supported by similar studies conducted previously, such as those in Indonesia by (Paramitha et al., 2020), Fanama and Praktikto (2019), and studies from Armstrong, et al. (2019) conducted in New Zealand.

CONCLUSIONS

Based on this study, it can be concluded that inflation, loan interest rates, exchange rates, and LTV can significantly affect property prices in Indonesia from 2008QIII to 2021QII. Economic growth, exchange rates, and LTV can affect property prices in Indonesia in a positive way, while inflation and interest rates affect in a negative way. Simultaneously, economic growth, inflation, loan interest rates, exchange rates, and LTV policies can affect property prices in Indonesia by 97.21 percent. This finding is further supported by the robustness test, concluding that after the implementation of the LTV policy in Indonesia, property prices have been effectively controlled from growing rapidly.

The continuously increasing property prices each year can be analyzed from the demand per-spective. On the demand side, economic growth, inflation, loan interest rates, exchange rates, and the Loan to Value (LTV) policy have all been proven to influence property prices in Indonesia. The property sector is one of the industries capable of generating significant multiplier effects, driving growth in other sectors of the economy. This study recommends the government and rel-evant authorities to continue to ensure that housing demand remains available at affordable pric-es. The way that can be done is to ensure that the factors that are proven to affect the movement of property prices in Indonesia remain stable. The relevant authorities are also expected to deter-mine the right time so that the LTV policy can begin to be applied in accordance with the prevail-ing economic conditions. The recommendation for the next study is to be able to analyze using different methods about what factors can affect the formation of property prices according to each region in Indonesia.

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