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LOAN TO VALUE RATIO, KPR AND KPA IN INDONESIA: AN ARDL APPROACH

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ABSTRACT

The COVID-19 pandemic that occurred at the beginning of 2020 has caused economic growth to decline in many countries, including Indonesia. One of the steps taken with the aim of economic recovery is by increasing the consumption in credit channels or non-credit channels, such as social aid. This thesis discusses loan-to-value ratio effects on property loans, KPR, and KPA in Indonesia. Property loans, KPR and KPA, are included in consumer credits, and loan-to-value ratio is one of the macroprudential policy instruments. The method used in this thesis is Autoregressive Distributed Lag linear regression (ARDL) with property credit, KPR, and KPA as the dependent variable, the dummy variable of the loan-to-value ratio as the independent variables, and consumer credit interest rates, gross domestic product and inflation as the control variables. In addition, the interaction variable between the dummy variable of loan-to-value ratio and consumer credit interest rate is also used. The results showed that the interaction variable between the dummy variable of tightening in loan-to-value ratio and consumer credit interest rate is significant to property loans, KPR, and KPA in the long run. Furthermore, GDP and consumer credit interest rates, which are control variables, are also significant to property loans, KPR, and KPA in the long run.

Keywords: *Loan-to-Value Ratio; KPR; KPA; COVID-19*
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Introduction

The world faced the COVID-19 pandemic unplanned in early 2020. This pandemic has made many adjustments to activities, from implementing health protocols to limiting activities. Schools are required to be online, limiting the number of employees who come to the office, and reducing the operating hours of public facilities such as shopping centers, restaurants/cafes, banks, recreation areas, and others. According to Clark (2016), a pandemic is a serial killer that can have devastating consequences for humans and the global economy. Restrictions on activities to prevent the spread of the virus turned out to have a huge impact, especially in the economic field. Financial transaction activities are physically restricted and even business activities must be closed which has an impact on reducing people's purchasing power (Yuliarto, 2021). The people's small purchasing power resulted in a low amount of production of goods and services during the COVID-19 pandemic (Tambunan, 2020; Wendy, 2020). According to BPS, Indonesia's economic growth is minus 2.07% in 2020 where

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Indonesia's economic growth is quite good at 5.17% in 2018 and decreased by 0.15% in 2019, but the decline is not too significant. Indonesia is trying to restore its economy consequence power buy distant society reduce in the middle of the COVID-19 pandemic. Research from Bloom et al. (2018) has shown a strong relationship between pandemic and performance economy due to macro cost very big economy from pandemic.

According to Perry Warjiyo, as Governor of Bank Indonesia, one step recovery economy with destination increase power buy Public is push growth credit, which weakened as a consequence of the COVID-19 pandemic (Rahman, 2012). Nakatani (2020) Amid the widespread Covid-19 crisis, macroprudential policy has garnered significant attention globally. His research also shows that macroprudential policy is effective in changing the possibility of a banking crisis through tracking credit and its effectiveness also depends on other macroeconomics policies. Cerutti et al. (2017) conclude that macroprudential policy has the effect to grow credit and price property. Lombardi & Siklos (2016) compiled an index to analyze macroprudential policy as to growth credit. According to the Central Bureau of Statistics, the property sector contributed 13.5% of GDP in 2019 and 13.6% in 2020.

The property sector can contribute for the recovery of the economy in the middle of the pandemic. As is well known the economy also had a downward impact from side demand in the property sector, KPR and KPA. Whereas if the property sector moves with good it will impact to related subsectors, e.g. services sale housing area or sector service owning finances function intermediation, for one distribution credit property. The loan to value ratio is an appropriate macroprudential policy instrument in encouraging an increase in lending, particularly consumer loans in the property sector, housing loans (KPR) and apartment ownership loans (KPA). In Taufik (2016) research, using the multiple linear regression (OLS) processing method, the application of an easing of the loan to value ratio had a significant effect on increasing the credit growth rate at the time the policy was issued. Research by Morgan et al. (2015) using the multiple linear regression (OLS) processing method also proves that the loan-to-value ratio is effective in controlling property credit. Based on the results of these studies, this study intends to conduct research related to the effect of LTV policies in the form of tightening to restrain increases in property loans and loosening up when economic growth is declining on increasing credit growth, especially KPR and KPA during the COVID-19 pandemic.

Literature Review

Increased consumption during the COVID-19 pandemic from the lending sector, especially property loans, KPR and KPA, is one of the steps for economic recovery. As understood, KPR and KPA are types of property loans, which means types of consumer loans are made privately and no additional goods and services are produced. The decline in economic growth during a pandemic has reduced people's income, which also has an impact on reducing people's purchasing power and people's consumption. If the income earned is greater, the encouragement for consumption activities will also be greater. Ludvigson (1999) research proves that consumption growth is correlated with predictable consumption credit growth. Furthermore, the basic theory of IS-LM version of Keynes also assumes perfect substitution of bank bonds and credit. However, in Bernanke & Blinder's (1988) model by liberating the Keynesian version of the perfect substitution assumption and ignoring credit rationing, another assumption is built that income influences bank credit demand.

According to Simorangkir (1991, p. 103), bank credit is a means of economic stability in the economy and trade. The basic standard for the manifestation of high economic growth is economic stability (Aflah, 2017; Putra & Wasiaturrahma, 2021). Therefore, Bank Indonesia encourages credit growth as an effort to recover the economy and efforts to maintain financial system stability which also has an impact amid the COVID-19 pandemic. Koong et al. (2017) argue that credit plays an important role in driving economic growth along its path. Furthermore, Mishra & Narayan (2015) stated the positive effect of credit on growth after

reaching a certain credit level affects financial stability. Al Ikhsan (2021) says the housing sector is one of the government's targets in economic recovery and is intended to drive the trend of increasing national economic recovery. Svobodová & Hedvičáková (2021) stated that credit property in the middle of 2019 experienced a decline and during the pandemic, credit property return experienced enhancement and credit property with ethnic group inclined interest decreased. Next, Trojanek, et al. (2021) found, in Poland, prices property on the market at the start of the pandemic declined by 1-2% and hypothesized that COVID-19 pandemic was significant in influencing a decline in house rentals.

Definition and Target of Loan to Value Ratio Application

The LTV ratio is a tool used for the purpose of controlling mortgages or KPA and property -backed consumer loans. Meanwhile, Islamic banking uses the term financing to value as another name for LTV. The size of the LTV ratio can be said to be a limit to the amount of property lending, especially KPR and KPA which is determined and is inversely proportional to the amount of down payment (DP). If the set ratio is high, then the down payment/DP paid will be low. One of the ideas that supports the application of the LTV ratio is important is the empirical result of research by Linneman & Susan (1989) that the down payment/DP requirement significantly limits households in terms of buying a house. Where, as explained earlier, the amount of down payment paid will affect the amount of credit that can be given. The enactment of the LTV ratio for both conventional and sharia commercial banks in Bank Indonesia's SE 2012 as a macroprudential policy instrument is targeted at weakening the occurrence of systemic risks that can arise from the growth of KPR and KPA where conditions at that time reached more than 40%. Meanwhile, during the current COVID-19 pandemic, which actually limited economic activity and had an impact on reducing people's purchasing power and economic growth, accommodative adjustments were made to macroprudential instruments through easing loan ratios to value. The aim is to improve the performance of the banking sector in terms of carrying out property lending/financing as a form of a balanced and quality intermediary function.

LTV ratio is one of the tools used by Bank Indonesia to encourage economic recovery amid the COVID-19 pandemic in Indonesia. Loan ratio easing to value is expected to increase domestic demand from increased consumption credit in the property sector, especially KPR and KPA for economic recovery while maintaining financial system stability. Market-based information, one of which is domestic credit growth, is important in explaining the financial stability of an economy (Koong et al., 2017). Research by Richter et al. (2019) shows changes in loan ratios to maximum value has an effect on credit growth and investigates the effect of loan ratios to value to economic growth.

Implementation of policies regarding loan ratios to value issued and implemented in 2012 are as in SE No. 14/10/DPNP. The implementation of the government housing program is exempted from applying the loan ratio to value. Furthermore, BI is reviewing related to improving the application of loan ratios to value in 2013 in SE BI No.15/40/DKMP. In the circular letter, it is explained that the maximum granting of KPR and KPA loans for type 70 or with a building area of more than 70 m^2 is 70%, for second ownership is 60% and for third and so on is 50% in conventional banks. Loan ratio to tightening values with the aim of controlling property lending, both at the start of implementation and in the refinement policy, has resulted in a slowdown in property credit growth in Indonesia where, in July 2012, it was 44.52% and became 12.48% in March 2015.

In relation to these conditions, Bank Indonesia is again reviewing the loan ratio policy adjustments to value in 2015. The policy adjustment was aimed at increasing demand for property loans which had slowed due to the previous two ratio tightening policies and was the first easing policy of the LTV ratio. Adjustments were made by loosening the LTV ratio with the intention that fewer down payments were made and more property loans were disbursed by banks. Easing the LTV ratio was carried out by increasing the ratio by 10% for each holding.

The easing policy of the LTV ratio in 2015 was the first easing policy issued by Bank Indonesia and the adjustment to the ratio policy did not consider the condition of the non-performing loan ratio in each KPR and KPA channeling institution, be it banking or non-banking. The easing is not intended for house ownership types of 22-70 m^2, flats <21 m^2, and shop houses/office houses. Changes in the ratio policy are detailed in Table 1 below.

Table 1: Loan to Value Ratio in 2012, 2013, and 2015

Ownership Type	2012 LTV Ratio	2013 LTV Ratio			2015 LTV Ratio		
	Tightening	Tightening			easing		
		I	III	III	I	III	III
House >70 m ²	70%	70%	60%	50%	80%	70%	60%
House 22-70 m ²	Unregulated	Unregulated	70%	60%	Unregulated	80%	70%
Flats >70 m ²	70%	70%	60%	50%	80%	70%	60%
Flat 22-70 m ²	Unregulated	80%	70%	60%	90%	80%	70%
Flats <21 m ²	Unregulated	Unregulated	70%	60%	Unregulated	80%	70%
Shophouse/Home Office	Unregulated	Unregulated	70%	60%	Unregulated	80%	70%

Loan ratio to this value was then stated again in 2016. However, only for arrangements forthe first credit/financing facility for landed houses ≤70m². Meanwhile, it is submitted to bank policies for apartments ≤21m² and office houses/shop houses. In the PBI, easing is also carried out by increasing the LTV ratio for the public and for banks, easing is carried out by disbursing gradually in providing credit for property ownership that is not fully available until the second order of facilities.

In August 2018, Bank Indonesia again issued a policy regulation regarding the LTV ratio for landed houses, apartments, and office houses/shop houses for the first facility to be submitted to bank policy, which is regulated for the second facility and so on. Furthermore, there were several changes to the loan ratio policy to value in 2019 and the latest in 2021. Meanwhile, in PBI No. 22/13/PBI/2020, there is only a change in the amount of down payment (DP) for motor vehicle loans. Based on regulations issued by Bank Indonesia, there are two SEs that are LTV tightening and five PBI that are LTV easing in the period March 2012 to February 2021. The latest LTV easing was adjusted to conditions where the pandemic was going on and it is hoped that this step can increase property credit in the middle of a pandemic. A summary of loan ratio policies to value is attached in Table 2 below.

Table 2: LTV Ratio Policy in Indonesia

No	LTV Ratio Policy	Date	Nature
1	SE No. 14/10/DPNP	March 15, 2012	Tightening
2	SE No. 15/40/DKMP	24 September 2013	Tightening
3	PBI No. 17/10/PBI/2015	18 June 2015	Easing
4	PBI No.18/16/PBI/2016	August 29, 2016	Easing
5	PBI No. 20/8/PBI/2018	August 1, 2018	Easing
6	PBI No. 21/13/PBI/2019	December 2, 2019	Easing
7	PBI No. 23/2/PBI/2021	March 1, 2021	Easing

Macroeconomic Variables on Property Credit

Bank Indonesia determines the prime lending rate which is the banking basis for determining each credit interest rate. Home Ownership Loans and non-KPR use interest rates that refer to the SBKK. Yunita R Sari, an executive researcher at Bank Indonesia, stated to Kompas.com that the interest rate that affects the amount of credit installments is a factor

that is very influential in applying for community property loans (Latief, 2012). Bhutta & Ringo (2021) stated that the response to interest rates greatly influences home purchases. This statement is in line with Poterba (1984), namely the standard theory showing housing demand can be very sensitive to interest rates. Based on the Press Release of Bank Indonesia SP No.23/93/ DKom, the economic recovery from the monetary side was also carried out by maintaining a low interest rate policy.

Economic growth is one of the control variables used in the research of Cerutti et al. (2017) which has a positive coefficient according to expectations on credit growth. Meanwhile, Taufik (2016) strengthens the relationship between GDP growth and positive property credit growth and is thought to have a correlation to people's purchasing power. Anastasia & Hidayat (2019) stated that GDP also affects bank credit; a higher GDP is a sign that many households are carrying out consumption activities, related to property and other products. Another study by Guo & Shi (2020) proved that there was an increase in mortgage credit due to increased economic growth and this is in line with Rakhmawati (2011) whose analysis also concluded that GDP had a positive effect on mortgage demand.

Nakatani (2020) stated that inflation targeting is necessary to achieve price stability, only including the monetary variable of interest rates is not enough to overcome all the effects because it cannot be captured only with the interest rate variable. Koong et al. (2017) argue fast credit expansion can cause high inflation which actually has the effect of slowing economic growth. If this happens, the economic recovery will automatically slow down. Therefore, the inflation rate is important in explaining financial stability in an economy. Rakhmawati (2011) concluded that, apart from GDP and credit interest rates, inflation also had a significant positive effect on the demand for mortgages. In addition, Panagiotidis & Printzis (2016) draw conclusions from several previous studies, namely inflation has various impacts, inflation causes an increase in house prices thereby reducing the demand for houses and inflation causes a decrease in real interest costs which actually encourages people to increase property investment.

Based on the previous explanation that the ratio of LTV and rates lower credit consumption are two factors that affect credit property, tightening the LTV ratio can control the rate of credit growth property and vice versa, while easing the LTV ratio can increase the rate of credit growth property. Next, the rate increase lowering credit consumption will reduce the demand for property loans, and vice versa, a decrease in interest rates lowers credit consumption which will increase the demand for credit property. Therefore, the interaction of the LTV ratio with terms that lowers credit consumption is meant to see how it impacts rates of lower credit consumption to credit properties at the time of application of tightening or easing ratios.

Data and Research Methods

Property credit data is sourced from SEKI Bank Indonesia. Data on consumer credit interest rates, GDP, and inflation are sourced from BPS. The period of use of research data is secondary monthly data from January 2010 to December 2021. On time series data analysis, stationarity test was conducted especially and is based in determination of the estimation model to be used in research. Based on stationarity test, the result shows that variables used are not stationary at the same level. So, the study uses the Autoregressive Distributed Lag (ARDL) linear regression method. This is one of the estimation methods for time series analysis that can see the effect of the dependent variable and the independent variable from time to time and can see influence variable bound. Unlike the Ordinary Least Squares (OLS) which requires all data to be stationary at the level, the ARDL estimation method does not require the data to be stationary in the same order. However, this estimation method cannot be used for stationary data at 2nd difference, as it is known that stationarity is important in time series analysis. When using non-stationary data in an estimation model, the regression results may have a relatively high R-Squared, but no significant relationship or what is

commonly called spurious regression. By using ARDL, long-term and short-term estimates can be obtained simultaneously which will avoid autocorrelation problems and this method is able to distinguish between independent and dependent variables (Zaretta & Yovita, 2019).

Result and Discussion

Result

Based on the previous explanation, the requirement to use the ARDL estimation method is that there is one variable that is stationary at the level and no variable is stationary in the second order (I (2)). Therefore, the stationarity test was carried out with the Augmented Dickey-Fuller unit-root test on the eviews 10 software. Based on the stationarity test, the results show that the variables used are not stationary at the same level, namely the log variable from KPR-KPA is stationary at the level and the rest, the consumer credit interest rate variable, the inflation variable, and the log variable from GDP, are not stationary at the level and stationery at 1st difference. As seen in Table 3 below.

Table 3: Data Stationarity Test Table

No.	Data	Levels t-stat	1st Diff – t-stat/prob	Level Real	CV Value	stationarity
1.	LOG (KPRA)	-3.7289	-10.3240	1%	-3.4765	Stationary on level
				5%	-2.8817	
				10%	-2.5776	
2.	SBKK	-1.9138	-12.6797	1%	-3.4765	Stationary at *1st difference*
				5%	-2.8817	
				10%	-2.5776	
3.	INFY	-1.5979	-8.9358	1%	-3.4771	Stationary at *1st difference*
				5%	-2.8820	
				10%	-2.5778	

Furthermore, the ARDL equation model is formed as follows:

$$\Delta KPt = \beta 0 + \beta 1 KPt{-}1 + \beta 2 DLTVKt{-}1 + \beta 3 DLTVL1t{-}1 + \beta 4 DLTVL2t{-}1 + \beta 5 SBKKt{-}1 + \beta 6 \text{GDP}t{-}1 + \beta 7 INFLt{-}1 + \beta 8 DLTVKt{-}1 * SBKKt{-}1 + \beta 9 DLTVL1t{-}1 * SBKKt{-}1 + \beta 10 DLTVL2t{-}1 * SBKKt{-}1 + \sum n\ \beta i\ \Delta KPt{-}1 + \sum n\ \beta j\ \Delta SBKKt + n\ i{=}0\ (1)\ \beta k\ \Delta \text{GDP}t + \sum n\ \beta l\ \Delta INFLt + e_t \quad (1)$$

Where: KP_t = KPR and KPA; β_0= Constant; β_1, β_2, β_3, β_4, β_5, β_6, β_7, β_8, β_9, β_{10}= Long-run ARDL Coefficient; β_i, β_j, β_k, β_l= Short Run Coefficient; $DLTVK_t$ = dummy variable where the value is 1 in the tightening period of the loan-to-value ratio policy and is 0 if experiencing these conditions; $DLTVL1_t$= dummy variable which is worth 1 in the period of easing the loan-to-value ratio policy before the pandemic and is 0 if it does not experience this condition; $DLTVL2_t$= dummy variable where the value is 1 during the loan-to-value ratio policy easing period during the pandemic and is 0 if it does not experience this condition; $SBKK_t$= Average interest rate on consumer credit; GDP_t= Gross Domestic Product, $INFL_t$= Inflation; $DLTVK_t$*$SBKK_t$= Dummy interaction variable of tightening LTV ratio policy with the average consumer credit interest rate; $DLTVL1_t$*$SBKK_t$= Dummy interaction variable of policy easing loan-to-value ratio before the pandemic with the average consumer credit interest rate; $DLTVL2_t$*$SBKK_t$= Dummy interaction variable of policy easing loan-to-value ratio during the pandemic with the average consumer credit interest rate; and e_t=residual / error

Based on the results of the stationarity test where the ARDL estimation method can be carried out in this study, then the next step is to carry out a cointegration bound test to determine whether there is a long-term relationship in the ARDL model. The results of the cointegration bound test obtain an F-statistic value of 12.20925 where the value is greater

than the (1) bound value. As seen in Table 4 below.

Table 4: Table of F-Bounds Test

Test Statistics	Value	Sig.	I(0)	I(1)
F-stat	12.20925	10%	2.37	3.2
k	3	5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66

Then, stability testing was also carried out using CUSUM. The CUSUM stability test shows that the tested model has been stable throughout the observation period. The results show that it is still included in the 5% critical bounds interval. As seen in Figure 1 below.

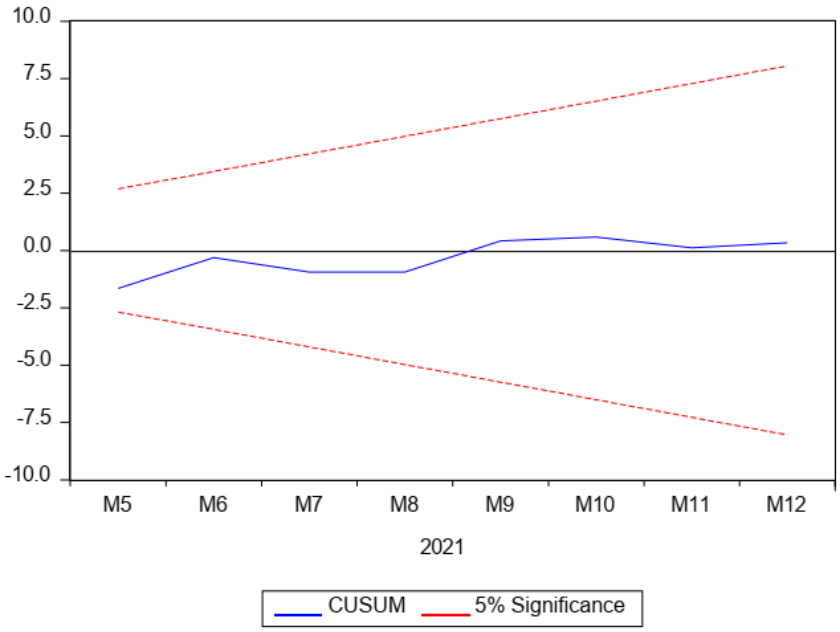

Figure 1: CUSUM Stability Test

The Autoregressive Distributed Lag model is a dynamic model that can see the effect of variable X and variable Y from time to time including the influence of variable Y from the past on the present Y value, in other words, it can see the long-term and short- term relationship (Nulhanuddin & Andriyani, 2020). The estimation results of the ARDL model in this study are shown in Table 5 below.

Table 5: ARDL Model Estimation Test Results

Variable	Coefficient	Std. Error	t-Statistic	Prob
C	-0.508984	0.624746	-0.814706	0.4168
LOGKPRA (-1)*	-0.129081	0.026812	-4.814247	0.0000
SBKK (-1)	-0.026013	0.009662	-2.692148	0.0081
INFI**	-0.001670	0.001275	-1.310045	0.1926
LOGGDP**	0.191102	0.061262	3.119416	0.0023
D(LOGKPRA(-1))	0.026105	0.084291	0.309707	0.7573
D(LOGKPRA(-2))	-0.185583	0.081027	-2.290376	0.0237
D(LOGKPRA(-3))	-0.251514	0.081235	-3.096144	0.0024
D(SBKK)	-0.006509	0.012661	-0.514142	0.6081

Variable	Coefficient	Std. Error	t-Statistic	Prob
D(SBKK(-1))	0.001601	0.010158	0.157614	0.8750
D(SBKK(-2))	0.026321	0.009636	2.731389	0.0072
D(SBKK(-3))	0.013568	0.009577	1.416817	0.1591
DLTVK	-0.022171	0.189508	-0.116994	0.9071
DLTVLBC	-0.328525	0.155971	-2.106321	0.0372
DLTVLAC	-0.093443	0.456011	-0.204914	0.8380
DLTVK_SBKK	0.001449	0.011137	0.130132	0.8967
DLTVLBC_SBKK	0.020545	0.009097	2.258432	0.0257
DLTVLAC_SBKK	0.002889	0.033702	0.085728	0.9318

Based on the test results above, the short-term model with ARDL has the following equation:

$$KP = -0.508984 - 0.006509\, SBKK \quad (2)$$

From the estimation results, it is known that KPR and KPA in the short term are only influenced by the variable interest rates on consumer loans. Meanwhile, inflation and GDP variables have no effect in the short term. Furthermore, if the consumer credit interest rate increases by 1% in the short term, it will reduce KPR and KPA by 0.007%. The test results conclude that the consumer credit interest rate variable at lag two has a positive and significant effect on KPR and KPA where the probability value is 0.0072. The lag that occurs is because interest rates are one of the instruments of monetary policy, where the monetary policy transmission mechanism has a relatively long and varied time lag (Goodhart, 2001). The increase in consumer credit interest rates should have been responded to by a decrease in KPR and KPA but on the contrary, due to limited research data, the interest rate data used are consumer credit interest rate data, not KPR and KPA interest rates, so the data are less accurate in the short term, although KPR and KPA are included in consumer credit. The coefficient of the variable ect(-1) is -0.129081 and issignificant. This means that 12% of the imbalance that occurs between KPR and KPA with consumer credit interest rates will be corrected again within one period (one month).

Then, in the long term, it is known that the consumer credit interest rate has a negative and significant relationship with KPR and KPA with a probability value of 0.0081 which is smaller than 5%. A 1% increase in consumer credit interest rates will reducemortgages and KPAs by 0.026% in the long term. GDP is also significant and has a positive relationship to KPR and KPA in the long term with a probability value of 0.0023 which is less than 5%. A 1% increase in GDP will increase KPR and KPA by 0.191% in the long term. Both variables are significant and in accordance with the theoretical basis in the previous chapter.

The only dummy variable of the LTV ratio that has a significant probability value in the long term is the dummy variable of the easing of the LTV ratio before the pandemic with a probability value of 0.0372 but harms KPR and KPA in the long term. Meanwhile, the expected impact of each application of easing the LTV ratio is to increase KPR and KPA following the LTV policy transmission. The implementation of the LTV ratio easing before the pandemic was based on four Bank Indonesia Regulations for the period June 2015 to December 2019. So, it can be said that the LTV ratio easing before the pandemic is not appropriate if the implementation continues in the long term. In this case, Bank Indonesia as the central bank needs to review the implementation of the appropriate LTV ratio easing in the future. Furthermore, there is one interaction variable from the implementation of the LTV ratio easing before the pandemic with the consumer credit interest rate which also has a significant probability value in the long term of 0.0257 and has a positive effect on KPR and KPA. This means that the interaction between the easing of the LTV ratio before the pandemic and consumer credit interest rates still has an impact on increasing mortgages and KPAs in the long term. The interaction in question between the two variables is an increase in KPR and KPA due to a decrease in consumer credit

interest rates during the implementation of the LTV ratio easing before the pandemic.

Discussion

Based on the estimation results, the two dummy variables of the LTV ratio easing both before the pandemic and after the pandemic have a negative coefficient sign. This means that the impact of loosening LTV affects reducing KPR and KPA. The loosening of the LTV ratio should have a positive relationship with KPR and KPA, which means that KPR and KPA will increase in the period of determining the LTV ratio. The dummy variable of the easing of the LTV ratio before the pandemic is significant in the estimation of the long-term model. Meanwhile, the dummy variable for the easing of the LTV ratio after the pandemic is not significant. The implementation of the easing of the LTV ratio after the pandemic is based on a Bank Indonesia Regulation issued on March 1, 2021, during which the COVID-19 pandemic occurred and weakened the economy. Umang Gianto, chairman of DPC Real Estate Indonesia, told Bisnis.com that, with economic conditions that were still sluggish, the stimulus in the form of easing LTV had little effect on home sales and suggested improving the economy so that people's purchasing power could increase. This is under the condition of people's low purchasing power during a pandemic so easing the LTV ratio will not have much effect. The results of this estimate are in accordance with Taufik (2016) research, namely the easing of the LTV ratio is not significant to the growth of property loans at the time of enforcement or at any alternative time lag that is estimated. Furthermore, Taufik (2016) also found different coefficient signs for the easing of the LTV ratio, where at lag 6 the LTV ratio easing dummy is negative and at 7 lag the LTV ratio easing dummy is positive. Although both are not significant.

In this study, one dummy variable was used for tightening the LTV ratio, and from the long-term estimation results, it is known that this variable has a negative and insignificant effect on KPR and KPA. The application of tightening the LTV ratio affects reducing the distribution of KPR and KPA. The basis for the implementation of the tightening of the LTV ratio is a Bank Indonesia Regulation for the period March 2012 - May 2015. Data on the distribution of mortgages and mortgages in the period of tightening the LTV ratio, from 2012 to 2015, appear to have an increasing pattern. Whereas the expected impact in the tightening period of the LTV ratio is a decrease in the distribution of KPR and KPA. The results of this long-term estimation are different from the results concluded in research from Taufik (2016) where the tightening of the LTV ratio has a negative and significant effect on property loan growth in the 6th and 7th alternative lags.

Based on the long-term estimation results, it is also known that the only control variable that is not significant for KPR and KPA is inflation, which has a negative coefficient sign. This means that an increase in inflation of 1% will reduce KPR and KPA by 0.002%. The insignificant inflation of KPR and KPA is in line with opinion from Samuelson (2009) that high inflation in an economy will cause a decrease in economic activity and a decrease in real income for people with fixed incomes. In other words, there is a decrease in people's purchasing power when inflation occurs. This causes a decrease in demand for property loans in the community. In addition, Panagiotidis & Printzis (2016) also draw the conclusion that inflation causes an increase in house prices, which can also reduce housing demand.

Conclusion

The results of this study concluded several things including that, in the short term, only the consumer credit interest rate variable affects KPR and KPA, while the inflation and GDP variables do not affect. The tightening LTV ratio policy, both the dummy variable and the dummy interaction with consumer credit interest rates, has a significant impact on KPR and KPA in the long run. The effect of tightening the LTV ratio has a negative relationship with KPR and KPA. Meanwhile, its interaction with consumer credit interest rates has a positive relationship. Furthermore, in the long term, the only control variable that is not significant is inflation, which means that the increase in mortgages and KPAs is not accompanied by an increase in inflation. This condition illustrates the success of Bank Indonesia in targeting low

inflation to increase public consumption, one of which is the increase in mortgages during the weakening economy during the pandemic. The variables of gross domestic product and interest rates on consumer loans are significant for KPR and KPA in the long term. The dummy interaction variable of LTV ratio easing and consumer credit interest rates either before the pandemic or during the pandemic is not significant for KPR and KPA.

The implementation of the LTV ratio policy, whether it is easing or tightening, is nothing but to maintain the stability of the financial system of the property credit line. Collaboration between monetary policy instruments, fiscal policy, and macroprudential policy must occur properly. The application of the policy nature of the LTV ratio, tightening or easing, must be adjusted to economic conditions and pay attention to the principle of prudence in its implementation. This is to prevent the negative impact of increasing property loans, one of which is an increase in non-performing loans in the property sector, which will disrupt the economic stability. Furthermore, the targeting of a low inflation rate amid efforts to recover the economy by increasing property loans must continue to be carried out to maintain price balance. Finally, for future researchers, the research conducted can add other control variables that have not been used in this research model.

Declarations

Conflict of Interest

The authors whose names are listed immediately below certify that there is no significant competing financial, professional, or personal interests that might have affected the performance.

Availability of Data and Materials

Data and material research can be provided at open data repositories (BPS and SEKI Bank Indonesia). Data Sharing is not applicable to this article as no new data were created or analyzed in this study.

Author's Contribution

NPA and ME conceptualized the study; NPA collected data; NPA and ME performed the analysis; NPA wrote reviewed and edited the manuscript; NPA and ME wrote the original draft.

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