The Macroprudential Policy: An Analysis of Indonesia's Financial System Stabilities

by Dede Ruslan

The Macroprudential Policy: An Analysis of Indonesia's Financial System Stabilities

Bakhtiar Efendi*
Universitas Sumatera Utara, Indonesia.
E-mail: koneksisaya@gmail.com

Sirojuzilam
Universitas Sumatera Utara, Indonesia.

Irsad
Universitas Sumatera Utara, Indonesia.

Dede Ruslan
Universitas Negeri Medan, Indonesia.

Abstract

One of the macroprudential policies that are often used mainly in Asia and including Indonesia is the Loan-to-Value policy with a function to overcome systemic risks related to housing price spikes and credit distribution. Data analysis uses Vector Auto Regression (VAR) and simultaneous equations (Simultaneous Regression). The data in this study is time-series data. Exchange rate variables have negative impact on inflation because rate of exchange instability will affect capital flows or investment and international trade. And tax variables have an insignificant negative effect on inflation due to the impact of rising inflation due to the shock of tax increases in taxes that are seen as increasing production costs and sales costs to consumers but in contrast to credits that have an insignificant positive effect on inflation.

Keywords

Composite Stock Price Index, Exchange Rate, Loan-to-Value, MMCA, Non Performance Loan.

Introduction

In macroprudential policy, there are several instruments in maintaining financial stability. Among others such as Loans to Value, Minimum Mandatory Current Account, Basic Interest Rate on Credit, Capital Adequacy Ratio, Net Opening Position, Net Foreign

Exchange Position, Minimum Holding Period which has its own goals in different fields from one instrument to another.

Macroprudential policies can be grouped to address the risks of high credit growth, high levels of leverage, liquidity issues, and volatility of capital flows and exchange rate fluctuations (Mirzaei et al., 2021). In this study, the authors limited some instruments that have been applied in Indonesia such as to overcome risks due to high credit growth rates and abnormal increases in asset prices such as poverty price bubbles, the appropriate policy is credit-related instruments such as LTV (loan to value).

One of the macroprudential policies that are often used mainly in Asia is the Loan-to-Value (LTV) policy with a function to overcome systemic risks related to housing price spikes and credit distribution. The implementation of the LTV ratio aims to reduce the number of loans that can be provided by financial institutions to suppress credit growth that will affect the demand for residential property which ultimately has an impact on residential property prices (Renita, 2018).


Source: Central bank of Indonesua (www.bi.go.id)
Figure 1 The LTV on 2001-2017

LTV growth can be seen that from 2001 - 2017 rose continuously, LDR growth can be seen that growth from 2001-2005 increased, but the value is not so great. LDR growth decreased from 2006, the highest LDR growth in 2017 reached 88.49%.

Macroprudential policy is also a policy that focuses on maintaining the stability of the financial system implemented with its instruments Regulation No. 16/11/PBI/2014 on Macroprudential Regulation. In maintaining financial system stability it is not enough just

to optimize monetary policy as done by Bank Indonesia but the need for other policies such as macroprudential policy because the monetary policy only focuses on price stability reflected by inflation and low-interest rates, while financial system stability is a condition disrupting the savings allocation process for investment and payment processing in the economy.
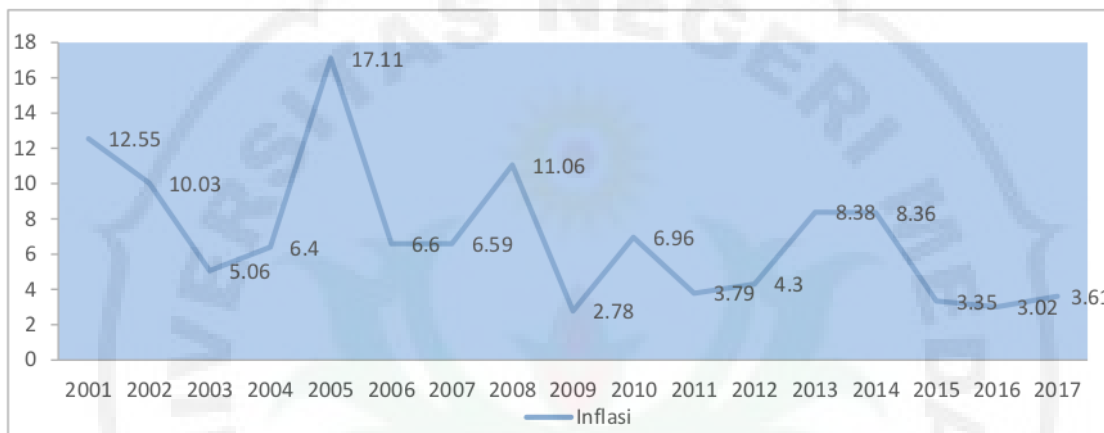
Source: www.bi.go.id
Figure 2 The Inflation of Indonesia on 2001-2017

Yodiatmaja (2012) stated that about a changes in BI Rate will affect several macroeconomic variables which are then passed on to inflation and changes in the form of increasing bi rate levels aim to reduce the rate of economic activity that can trigger inflation. One of the factors that affect changes in inflation in Indonesia is the benchmark interest rate of Bank Indonesia or in other words bi rate which is a signal for banks to set interest rates such as savings, deposits and credit.

Literature Review

Loan to Value

The Loan to Value Ratio for Property Loans, Financing to Value Ratio for property financing and Advances for or Motor Vehicle Financing (Bank Indonesia Regulation Number 20/8/PBI/2018). To encourage the running of supporting national economic growth while maintaining financial system stability as a banking intermediation function (Syahyunan et al., 2017), Bank of Indonesia decided to implement a more accommodative Macroprudential policy in the property sector through adjustment of loan to value indicator for property loans as well as financing value ratio for the property financing, adjustment of a maximum number of property loan facilities or property financing for owners not fully

available, and adjustment of the stage arrangement and amount of disbursement of KP/PP for ownership of indented property.

Non-Performing Loan

According to (Slamet, 2006 and Sinaga et al., 2020), Non-Performing Loan is a proportion between the amount of credit outstanding with a collectibility rate of 3 - 5 compared to the total credit by the bank. The maximum of 5%, if it exceeds 5% it will affect the assessment to Health Level of the Bank concerned which will reduce the value/score obtained.

Loan to Deposit Ratio

The measure the ability of whether the bank can meet short-term obligations or is often referred to as liquidity. This liquidity is very important to see if the bank can meet the demands of its customers, if the customer needs or takes funds suddenly and or distributes loans (credit) to borrowers (debtors) (Macroeconomicdashboard.feb.ugm.ac.id, 2017).

Capital Adequacy Ratio

Is a fairness ratio in the capital that can show whether a bank can provide funds to overcome the possibility of loss. In this case, when CAR has considerable value, then the bank has a fairly good ability to deal with the possibility of loss risk. In addition to CAR, it is important to see if the bank can overcome the possibility of losses, it will also indirectly protect customers (Macroeconomicdashboard.feb.ugm.ac.id, 2017).

Minimum Holding Period

The minimum Holding period is the period investors try to hold or hold their shares, and for a certain time diversify investments with a certain amount of money, which is allocated to various portfolios to generate maximum profits (Yuniningsih, 2008).

Net Foreign Exchange Position

Can be defined as a ratio that describes the comparison between the difference in forex assets and forex passive coupled with the net difference off-balance-sheet divided by capital, in addition, it can also be interpreted as a number absolute value for the amount of the net difference in assets and passive in the balance sheet for each foreign exchange, coupled with the net difference in bills and liabilities which are contingencies of each forex, all of which are expressed in Rupiah (Mayasari and Setiawan, 2013).

Net Open Position

A net Open Position is the absolute value for the difference in assets in the balance sheet for each foreign exchange coupled with the net difference in bills and liabilities are commitments in the administrative account for each foreign exchange, all of which are expressed in Rupiah (Purnawan et al, 2015).

Research Method

The type of research is a quantitative method. According to Rusiadi (2014) quantitative research is a research to find the relationship and pattern of influence between variables. This research will be built a theory to explain and control a symptom. Data analysis uses Vector Auto Regression (VAR) and simultaneous equations (Simultaneous Regression). The data in this study is time-series data. Here are the stages in the research of simultaneous equation methods.

1. Identification of Simultaneity

To see the relationship between endogenous variables, the first step is to identify the equation. This identification is intended to determine whether the equation is in one of the following conditions: under-identified, exactly identified or over-identified. The identification is as follows:

$$LOG(INF)=C(10)+(11)*LOG(ER)+C(12)*LOG(BIRATE)+C(13)*(TAX)+C(14)*LOG(CRE)+ \varepsilon_1 \qquad (1)$$

$$LOG(CRE)=C(20)+(21)*LOG(LTV)+C(22)*LOG(GDP)+C(23)*LOG(MMCA)+C(24)*LOG(INF)+ \varepsilon_2 \qquad (2)$$

Table 1 The Result of identification test

Equation	K-k	m-1	Result	Identification
INF	5-2	4-1	3=3	*Exact identification*
CRE	5-2	4-1	3=3	*Exact identification*

Source: Author

2. Test Goodness of Fit

Adjust R-Square (coefficient of determination) aims to find out the strength of the independent variable describes the variable bound (dependent variable). The F-test is intended to determine the statistical significance of the regression coefficient in unison. If Fhit > Ftabel, then H0 is rejected and H1 is accepted.

3. Classic Assumption Deviation Test

    1) Normality test

        a. If the J-B test value > X^2tabel (Prob < 0.05), then the hypothesis that residual u_i is normal distribution is rejected.

        b. If the J-B test value < X^2tabel (Prob > 0.05), then the hypothesis that residual u_i is normally distributed is accepted.

    2) Autocorrelation test

        Is intended to determine whether there is a correlation between residuals (members) on a particular set of observations in a given period. In multiple linear regression models, it must also be free of autocorrelation.

While the stages of analysis vector autoregression (VAR) are as follows:

1. Stationarity test

Unit Root Test is the concepts recently increasingly popularly used to test the percentage of time series data (Wang et al., 2021). The test was developed by Dickey and Fuller, using the Augmented Dickey-Fuller Test (ADF). The stationarity test that will be used is the ADF test using a real standard of 5%.

2. Cointegration test

Regressions that use time-series data that are not stationary. This happens because the relationship between the two which is time-series data only shows trends.

3. Impulse Response Function

The Response Function is performed to determine the response of each variable to one standard deviation of innovation (Pramono, 2006). The IRF analysis aims to find out whether each transmits variable is integrated in the short-term or long-term periods.

4. Vector Autoregression

According to Sims (Manurung, 2005) if the simultaneity between several variables is correct then it can be said that the variable cannot be distinguished which is the endogenous variable and which is the exogenous variable. VAR testing with the formula:

$$LTV_t = \beta_{10}LTV_{t-p} + \beta_{11}LDR_{t-p} + \beta_{12}BIRATE_{t-p} + \beta_{13}ER_{t-p} + \beta_{14}CSPI_{t-p} +$$
$$\beta_{15}GDP_{t-p} + \beta_{16}INF_{t-p} + \beta_{17}NPL_{t-p} + e_{t1} \tag{3}$$

$$LDR_t = \beta_{20}LDR_{t-p} + \beta_{21}LTV_{t-p} + \beta_{22}BIRATE_{t-p} + \beta_{23}ER_{t-p} + \beta_{24}CSPI_{t-p} +$$
$$\beta_{25}GDP_{t-p} + \beta_{26}INF_{t-p} + \beta_{27}NPL_{t-p} + e_{t2} \tag{4}$$

$$BIRATE_t = \beta_{30}BIRATE_{t-p} + \beta_{31}LDR_{t-p} + \beta_{32}LTV_{t-p} + \beta_{33}ER_{t-p} + \beta_{34}CSPI_{t-p} +$$
$$\beta_{35}GDP_{t-p} + \beta_{36}INF_{t-p} + \beta_{37}NPL_{t-p} + e_{t3} \tag{5}$$

$$ER_t = \beta_{40}ER_{t-p} + \beta_{41}BIRATE_{t-p} + \beta_{42}LDR_{t-p} + \beta_{43}LTV_{t-p} + \beta_{44}CSPI_{t-p} +$$
$$\beta_{45}GDP_{t-p} + \beta_{46}INF_{t-p} + \beta_{47}NPL_{t-p} + e_{t4} \tag{6}$$

$$CSPI_t = \beta_{50}CSPI_{t-p} + \beta_{51}ER_{t-p} + \beta_{52}BIRATE_{t-p} + \beta_{53}LDR_{t-p} + \beta_{54}LTV_{t-p} +$$
$$\beta_{55}GDP_{t-p} + \beta_{56}INF_{t-p} + \beta_{57}NPL_{t-p} + e_{t5} \tag{7}$$

$$GDP_t = \beta_{60}GDP_{t-p} + \beta_{61}CSPI_{t-p} + \beta_{62}ER_{t-p} + \beta_{63}BIRATE_{t-p} + \beta_{64}LDR_{t-p} +$$
$$\beta_{65}LTV_{t-p} + \beta_{66}INF_{t-p} + \beta_{67}NPL_{t-p} + e_{t6} \tag{8}$$

$$INF_t = \beta_{70}INF_{t-p} + \beta_{71}GDP_{t-p} + \beta_{72}CSPI_{t-p} + \beta_{73}ER_{t-p} +$$
$$\beta_{74}BIRATE_{t-p} + \beta_{75}LDR_{t-p} + \beta_{76}LTV_{t-p} + \beta_{77}NPL_{t-p} + e_{t7} \tag{9}$$

$$NPL_t = \beta_{80}NPL_{t-p} \beta_{81}INF_{t-p} + \beta_{82}GDP_{t-p} + \beta_{83}CSPI_{t-p} + \beta_{84}ER_{t-p} +$$
$$\beta_{85}BIRATE_{t-p} + \beta_{86}LDR_{t-p} + \beta_{87}LTV_{t-p} + e_{t8} \tag{10}$$

Where:

LTV	=	Loan To Value
LDR	=	Loan To Deposit Ratio
BIRATE	=	BI Rate (%)
GDP	=	Gross Domestic Product (US$)
CSPI	=	Composite Stock Price Index
ER	=	Exchange rate (LCU)
INF	=	Inflation (%)
NPL	=	Non Performance Loan (%)
et	=	Random disturbance
Jp	=	Lag

Results and Discussion

Macroprudential policy is aimed at encouraging the banking intermediation function while maintaining financial system stability. Maintaining financial system stability provides space for Bank Indonesia to continue the accommodative macroprudential policy that has been pursued before. The accommodative macroprudential policy will improve the direction of the financial cycle, which is currently still declining, support the ongoing economic recovery process. Bank Indonesia throughout 2017 continues the stance of the accommodative loan to value/financing to value and loan to funding ratio policies that have

been pursued since 2015. Efforts to encourage improvement in the financial cycle also strengthen by maintaining banking capacity in providing credit through the reassignment of the amount of countercyclical capital buffer (CCB) by 0%.

Table 2 Estimation of the Simultan Regression

System: YCM				
Estimation Method: Two-Stage Least Squares				
Total balanced observations 14				
	Coefficient	Std. Error	t-Statistic	Prob.
C(10)	-17430.21	7001.048	-2.489657	0.0675
C(11)	-93.33811	23.27953	-4.009450	0.0160
C(12)	1.058492	0.299717	3.531642	0.0242
C(13)	-32.04380	21.41503	-1.496323	0.2089
C(14)	5451.342	2153.505	2.531381	0.0646
C(20)	3.201108	0.082719	38.69864	0.0000
C(21)	-4.43E-05	2.32E-05	-1.910197	0.1287
C(22)	0.005055	0.012582	0.401814	0.7084
C(23)	0.080857	0.202049	0.400186	0.7095
C(24)	-1.35E-06	5.76E-07	-2.348357	0.0787
Determinant residual covariance		1.60E-14		
Equation: INF=C(10)+C(11)*KURS+C(12)*SBI+C(13)*TAX+C(14)*KRD				
Instruments: KURS SBI TAX LTV GDP GWM				
Observations: 7				
R-squared	0.980278	Mean dependent var		4.652857
Adjusted R-squared	0.940835	S.D. dependent var		2.554106
S.E. of regression	0.621259	Sum squared resid		0.771926
Durbin-Watson stat	3.113441			
Equation: KRD=C(20)+C(21)*LTV+C(22)*GDP+C(23)*GWM+C(24)*INF				
Instruments: KURS SBI TAX LTV GDP GWM				
Observations: 7				
R-squared	0.999999	Mean dependent var		3.304490
Adjusted R-squared	0.999996	S.D. dependent var		0.000465
S.E. of regression	8.77E-07	Sum squared resid		1.54E-12
Durbin-Watson stat	2.150367			

Source: Eviews, data processed

Based on the results of the data analysis it is known that inflation is significantly influenced by the exchange rate and interest rates.

The exchange rate variable is one of the independent variables that affect dependent variables, namely inflation in Indonesia. An exchange rate is the price or value of the currency of a country against the currency of another country. The findings showed that the exchange rate had a negative and significant influence on inflation in Indonesia.

Exchange rate instability will affect capital flows. Indonesia as a country that imports a lot of industrial raw materials experienced the impact and instability of this exchange rate. The weakening of the Rupiah caused the Indonesian economy to falter and be hit by an economic crisis and confidence in the domestic currency (Triyono, 2008). The spikes at the rate of this will make it difficult for producers to get raw materials and capital goods that have a high import content so that it will then have an impact on the rising cost of importing goods for the production.

While the interest rate variable is one of the independent variables that affect dependent variables, namely inflation in Indonesia. The findings showed that interest rates have a positive and significant influence on inflation in Indonesia. This is not by the theory, that the higher the interest rate will lower the inflation rate in Indonesia.

One of the factors that influence the change in Inflation in Indonesia is the benchmark Interest Rate of Bank Indonesia in other words BI Rate which is a signal for banks to set their interest rates such as savings, deposits and credit. According to Yodiatmaja (2012), bi rate changes will affect several macroeconomic variables that are then forwarded to inflation. Changes in the form of increasing bi rate levels aim to reduce the rate of economic activity that can trigger inflation. When the BI Rate level rises, the interest rate on loans and deposits will increase. When deposit rates rise, people will tend to keep their money in the bank and the money supply decreases. On credit rates, rising interest rates will stimulate businesses to reduce their investments because capital costs are getting higher.

Inflation variables have a negative and insignificant effect on credit growth. The findings are in line with Wardihan Sabar and Kuslin (2018) that inflation does not show a significant influence on Credit Growth in Indonesia. The inflation variable is one of the independent variables that affect dependent variables, namely credit growth in Indonesia. Inflation can create an unstable environment for economic decisions. If consumers expect that future inflation rates will rise, it will encourage them to make massive purchases of goods and services at the present moment rather than waiting for prices to rise again. Similarly, banks, or other lending institutions, if they suspect that the inflation rate on loans provided as a protective measure in the face of decline.

Vector Auto Regression (VAR)

Result of the Stationarity Test

Stationarity tests can be done with the root test of the unit. An alternative to the Dickey-Fuller test is augmented Dickey-Fuller (ADF) which seeks to minimize autocorrelation.

This test contains regression from the first inference of time-demanding data to the lag of those variables, lagged difference terms, constants, and trend variables (Kuncoro, 2001). The using a DF test was performed by comparing Mc Kinnon's critical value at 1% with a Dickey-Fuller Augmented value.

The study began with stationary tests of the variables used in the study: GDP, LTV, LDR, BIRATE, CSPI, ER, NPL and INF. The results of data stationarity testing for all variables are as follows:

**Table 3 Result of stationarity test**

Variable	Level	1st difference
GDP	-1.582923	-4.026201
	-3.886751	-3.808546
	0.4692*	0.0063*
LTV	-5.025607	-5.025607
	-3.788030	-3.788030
	0.0007*	0.0007*
LDR	0.648323	-4.453389
	-3.886751	-3.886751
	0.9866*	0.0033*
BI RATE	-3.216445	-3.858551
	-3.831511	-3.857386
	0.0348*	0.0100*
CSPI	-0.557596	-5.681102
	-3.788030	-3.808546
	0.8604*	0.0002*
ER	-4.012560	-4.012560
	-3.788030	-3.788030
	0.0061*	0.0061*
NPL	-1.621402	-3.745864
	-3.788030	-3.831511
	0.4546*	0.0119*
INF	-3.755823	-12.10152
	-3.788030	-3.831511
	0.0107*	0.0000*

Source: Eviews, data processed

Dickey Fuller's Augmented test results in the table above show that the data of all variables are stationary at 1st difference.

VAR Structure Lag Stability Test Results

Inverse Roots of AR Characteristic Polynomial
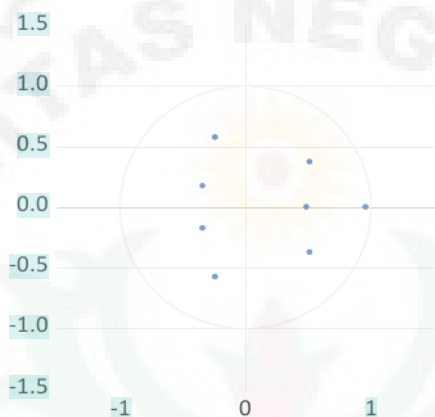
Source: Eviews, data processed
Figure 3 Stability of Structure Lag

The Table shows the roots modulus value below 1 and then the Figure shows the roots point is in the circle line. The results of the above lag determination show that in lag 1 the AIC value (-1.12) is lower than the AIC value in lag 2 which is (-3.45). The conclusion is that the use of VAR in lag 1 is more optimal compared to VAR in lag 2. So this study used lag 1 to analyze it.

Table 4 VAR at Lag 1 and Lag 2

Vector Autoregression Estimates Date: 04/11/2019 Time: 02:15 Sample (adjusted): 2.22 Included Observations: 21 after adjustments Standard error () & t-statistics in [ ]		Vector Autoregression Estimates Date: 04/11/2019 Time: 02:37 Sample (adjusted): 3.22 Included Observations: 20 after adjustments Standard error () & t-statistics in [ ]	
R-squared	0.951590	R-squared	0.997032
Adj. R-squared	0.919317	Adj. R-Squared	0.981202
Sum sq. Resids	0.170058	Sum sq. Resids	0.006744
S.E. equation	0.119044	S. E equition	0.047412
F-statistic	29.48558	F-Statistic	62.98425
Log likelihood	20.77175	Log likelihood	51.57004
Akaike AIC	-1.121119	Akaike AIC	-3.457004
Schwarz SC	-0.673466	Schwarz SC	-2. 610632
		Me. Mean dependent	14. 48764
		S.D dependent	0.345806

Source: Eviews, data processed

The results of the above lag determination show that in lag 1 the AIC value (-1.12) is lower than the AIC value in lag 2 which is (-3.45). The conclusion is that the use of VAR in lag 1 is more optimal compared to VAR in lag 2. So this study used lag 1 to analyze it.

Vector Autoregression

After the assumption test, the next step is to analyze the VAR as a follows (Table 5):

Table 5 The VAR Estimation

Vector Autoregression Estimates							
Date: 04/11/19 Time: 02:15							
Sample (adjusted): 2 22							
	LNGDP	LNLTV	LNLDR	SB	LNCSPI	LNKURS	NPL	INFLASI
LNGDP(-1)	0.210125	-1.104896	-5.081148	6.776303	1.915462	-0.016666	-1.102201	0.677920
	(0.29660)	(0.77235)	(12.0180)	(11.2615)	(0.87792)	(0.23531)	(2.76040)	(12.3349)
	[0.70846]	[-1.43056]	[-0.42279]	[0.60172]	[2.18183]	[-0.07083]	[-0.39929]	[0.05496]
LNLTV(-1)	0.104731	-0.575163	2.730020	-3.042135	0.167777	0.376213	0.623195	21.55005
	(0.06707)	(0.17464)	(2.71749)	(2.54642)	(0.19851)	(0.05321)	(0.62418)	(2.78913)
	[1.56163]	[-3.29338]	[1.00461]	[-1.19467]	[0.84517]	[7.07064]	[0.99843]	[7.72644]
LNLDR(-1)	0.000706	0.000421	-0.035754	-0.109681	0.004579	0.005585	0.044428	-0.242713
	(0.00494)	(0.01286)	(0.20005)	(0.18746)	(0.01461)	(0.00392)	(0.04595)	(0.20532)
	[0.14300]	[0.03278]	[-0.17873]	[-0.58511]	[0.31331]	[1.42599]	[0.96690]	[-1.18210]
SB(-1)	0.002802	0.009946	0.032238	-0.265336	-0.007905	-0.003311	-0.028929	-0.297073
	(0.00607)	(0.01581)	(0.24596)	(0.23047)	(0.01797)	(0.00482)	(0.05649)	(0.25244)
	[0.46154]	[0.62925]	[0.13107]	[-1.15126]	[-0.43996]	[-0.68752]	[-0.51208]	[-1.17679]
LNCSPI(-1)	0.116433	0.534541	7.983621	0.561072	0.527027	-0.080771	-0.964790	-2.554005
	(0.06587)	(0.17154)	(2.66920)	(2.50117)	(0.19498)	(0.05226)	(0.61309)	(2.73957)
	[1.76752]	[3.11615]	[2.99101]	[0.22432]	[2.70291]	[-1.54549]	[-1.57366]	[-0.93226]
LNKURS(-1)	0.488277	-0.308490	4.483610	-1.122079	-0.967081	0.723447	1.076245	-2.115498
	(0.23971)	(0.62423)	(9.71319)	(9.10172)	(0.70955)	(0.19018)	(2.23101)	(9.96926)
	[2.03692]	[-0.49420]	[0.46160]	[-0.12328]	[-1.36296]	[3.80398]	[0.48240]	[-0.21220]
NPL(-1)	-0.005928	-0.040780	-2.137585	0.690433	0.019726	0.000282	0.551290	0.649506
	(0.02506)	(0.06526)	(1.01547)	(0.95154)	(0.07418)	(0.01988)	(0.23324)	(1.04224)
	[-0.23655]	[-0.62488]	[-2.10503]	[0.72560]	[0.26593]	[0.01421]	[2.36361]	[0.62318]
INFLASI(-1)	-0.005001	-0.008744	0.284014	-0.011982	0.018521	-0.005864	-0.035236	0.190909
	(0.00414)	(0.01078)	(0.16776)	(0.15720)	(0.01226)	(0.00328)	(0.03853)	(0.17219)
	[-1.20801]	[-0.81103]	[1.69294]	[-0.07622]	[1.51128]	[-1.78512]	[-0.91442]	[1.10874]
C	5.622271	22.79165	43.41463	-59.24269	-16.53138	1.220001	9.015008	-53.73401
	(2.21374)	(5.76470)	(89.7008)	(84.0538)	(6.55262)	(1.75632)	(20.6032)	(92.0655)
	[2.53972]	[3.95366]	[0.48399]	[-0.70482]	[-2.52286]	[0.69464]	[0.43755]	[-0.58365]

Source: Eviews, data processed

From the results of estimates conducted interdependence relationships between policy mixes, this is illustrated from the test of each variable, namely, variable macroprudential instruments LTV and GWM-LDR, monetary economic variables interest rates, exchange rates and inflation and economic variables that understand GDP, CSPI, and NPL contribute to creating financial system stability in Indonesia is to answer the gap between tightening monetary policy at a time when the economy is growing and the economy is growing

(Tambunan et al., 2017). Monetary policy at a time when the economy is sluggish as a control in restraining the pace of economic growth which according to Keynes that due to overactive government tightening and easing monetary policy than in the short term will affect real economic growth while in the long term will affect price stability for that there needs to be consideration of the financial cycle.

Thus the use of a mix of macroprudential policy variables and monetary economic policies as well as economic variables became a novelty and novelties in this study such as the use of CSPI and NPL variables.

While from the analysis of VAR against NPL that most affect the Exchange Rate and LTV, the NPL's relationship with the exchange rate is that if the rupiah rate weakens against the US dollar then it will cause the community to reduce credit in the bank so that the NPL will also weaken. While the NPL relationship with LTV is that if the value of LTV increases, the value of NPL will also increase. But the NPL will decrease if the interest rate can be lowered or the balance will be maintained if the interest rate can be maintained.

FEVD test results show that short-term, medium-term and long-term policies in CSPI control are affected by LTV. This means that if there is an increase in LTV it will increase CSPI and vice versa, if there is a decrease in LTV it will decrease CSPI which will affect people's purchasing power to the poverty sector.

Thus the policy of tightening and easing LTV according to the financial cycle will greatly affect the Composite Stock Price Index (CSPI) especially in the poverty sector which is very closely related to macroprudential instruments, especially LTV policy by the central bank, in this case, is Bank Indonesia. Because the poverty sector is one of the sectors that are very able to absorb large amounts of labour and has a chain effect (multiplier effect) and backward linkage that is quite large to other sectors of the economy.

Another novelty is the estimate of the NPL variables drawn from the FEVD test results showing that for the short term NPL control is carried out by interest rates. In the medium and long term policies in NPL control are influenced by BITRATE and GDP. Interest rates show a positive effect on NPL results under Ginting's research (2016). This means that if there is a rate increase it will raise the NPL and vice versa if there is a rate cut then there will be a decrease in NPL.

Conclusion

Exchange rate have effect on inflation because exchange rate instability will affect capital flows or investment and international trade. And tax variables have an insignificant negative effect on inflation due to the impact of rising inflation due to the shock of tax increases are likely triggered by an increase in taxes that are seen as increasing production costs and sales costs to consumers but in contrast to credits that have an insignificant positive effect on inflation.

In this study, it is explained that the Composite Stock Price Index and interest rates are strongly influenced by LTV which is illustrated from the results of the study that the policy of lowering LTV is appreciated by the public by buying stocks and the poverty sector because the public tends to increase credit to banking and thus the target of economic growth can be maintained. Then the LDR (Loan To Debit Ratio) greatly affects the CSPI illustrated by the results of research that the policy of lowering interest rates will also reduce LTV which can affect people's purchasing power.

References

Gadjahmada Institute (2017). *Macroeconomic Dashboard*. https://Macroeconomicdashboard.feb.ugm.ac.id

Andika, M., & Djoko, B.S. (2013). Capital Ratio in Regional Development Banks. *Journal of Business and Banking, 3*(1), 119-134.

Bank of Indonesia (2014). Macroprudential Regulation in Bank Indonesia Regulation No. 16/11/PBI/2014, Jakarta.

Bank of Indonesia (2018). financing and Advances for or Motor Vehicle Financing on Regulation Number 20/8/PBI/2018, Jakarta.

Purnawan, M.E., & Nasir, M.A. (2015). The Role Of Macroprudential Policy To Manage Exchange Rate Volatility, Excess Banking And Credits. *Journal of Bank Indonesia, 12*(1), 34-51.

Renita, (2018). Journal of Macroprudential Policy Effectiveness Analysis on Loan-to-Value (LTV) Instruments in Mitigating Credit Risk in Indonesia. Faculty of Economics and Business. University of Jember.

Russiadi, et. al., (2014). Research Methods, Management, Accounting and Development Economics. SPSS, Eviews, Amos and Lisrel Second Edition Concepts and Applications. Medan : USU Press.

Sinaga, J.S., Muda, I., & Silalahi, A.S. (2020). The Effect of BI Rate, Exchange Rate, Inflation and Third Party Fund (DPK) on Credit Distribution and Its Impact on Non Performing Loan (NPL) on XYZ Commercial Segment Bank. *Universal Journal of Accounting and Finance, 8*(3), 55-64. https://doi.org/10.13189/ujaf.2020.080301

Syahyunan, S., Muda, I., Siregar, H.S., Sadalia, I., & Chandra, G. (2017). The effect of Lerner Index and income diversification on the general bank stability in Indonesia. *Banks & bank systems*, *12*(4), 56-64.

Tambunan, B.H., Nasution, B.A., & Sihombing, H. (2017). Accounting for the Global Economy: Is National Regulation Doomed to Disappear?. *Jurnal Ilmiah Wahana Akuntansi*, *12*(2), 122-142. https://doi.org/10.21009/wahana.12.022

Triyono, (2008). Analysis of Changes in the Exchange Rate of the Rupiah against the US Dollar. *Development Economics*, *9*(2), 156-167.

Wang, J., Ji, T., & Li, M. (2021). A Combined Short-Term Forecast Model of Wind Power Based on Empirical Mode Decomposition and Augmented Dickey-Fuller Test. *In Journal of Physics: Conference Series*, Vol. 2022, No. 1.

Wardihan, S., & Kuslin. (2018). Assessing the Impact of Interest Rates, Exchange Rates, and Inflation on Demand for Consumer Credit, *2*(2), 45-56.

Yodiatmaja. (2012). *Dissecting the Banking Crisis: Anatomy of a Crisis and Bank Restructuring*. Sad Satria Bhakti Foundation. Jakarta.

Mirzaei, A., Pasiouras, F., & Samet, A. (2021). State ownership, macroprudential policies, and bank lending. *Journal of International Money and Finance*, *117*.

The Macroprudential Policy: An Analysis of Indonesia's Financial System Stabilities

9   dokumen.pub
     Internet Source   1 %

10   www.scitepress.org
     Internet Source   1 %

11   www.koreascience.or.kr
     Internet Source   1 %

12   ulspace.ul.ac.za
     Internet Source   1 %

13   Andrea Saayman. "The Real Equilibrium South   <1 %
     African Rand/US Dollar Exchange Rate: A
     Comparison of Alternative Measures",
     International Advances in Economic Research,
     2007
     Publication

14   bircu-journal.com
     Internet Source   <1 %

15   pdfs.semanticscholar.org
     Internet Source   <1 %

16   scindeks-clanci.ceon.rs
     Internet Source   <1 %

17   smartlib.umri.ac.id
     Internet Source   <1 %

18   www.sciencegate.app
     Internet Source   <1 %

19 www.scirp.org
Internet Source
<1%

20 ijisrt.com
Internet Source
<1%

21 ejurnalunsam.id
Internet Source
<1%

22 everant.org
Internet Source
<1%

23 repository.usahid.ac.id
Internet Source
<1%

24 e-jurnal.unisfat.ac.id
Internet Source
<1%

25 Submitted to Oxford Brookes University
Student Paper
<1%

26 Submitted to School of Business and
Management ITB
Student Paper
<1%

27 Dyar Paramitha, Ahmad Gamal, Azrar Hadi.
"Loan to value (LTV) ratio policy and its impact
to property development", AIP Publishing,
2020
Publication
<1%

28 es.scribd.com
Internet Source
<1%

miep.usu.ac.id

29   Internet Source   <1%

30   core.ac.uk
      Internet Source   <1%

31   doaj.org
      Internet Source   <1%

32   ideas.repec.org
      Internet Source   <1%

33   journal.unnes.ac.id
      Internet Source   <1%

34   jurnal.uinsu.ac.id
      Internet Source   <1%

35   Benjamin Adam Abugri, Gökçe A. Soydemir.
      "The U.S. Productivity Figures and Foreign   <1%
      Direct Investment in Japan", Review of Pacific
      Basin Financial Markets and Policies, 2011
      Publication

36   Submitted to Bournemouth University
      Student Paper   <1%

37   Rico Bagus Satrio, Achmad Kemal Hidayat,
      Amelia Hayati. "The Impact of Transjakarta   <1%
      Bus Rapid Transit (BRT) Operationalization on
      Economic Growth and Unemployment Rate in
      DKI Jakarta Province", Quantitative Economics
      and Management Studies, 2023
      Publication

38 Riduwan Riduwan, Rofiul Wahyudi.
"Contribution of macroprudensial policy of
central bank on microprudensial Islamic
banking", INFERENSI: Jurnal Penelitian Sosial
Keagamaan, 2018
Publication

<1 %

39 docplayer.net
Internet Source

<1 %

40 repository.president.ac.id
Internet Source

<1 %

41 talenta.usu.ac.id
Internet Source

<1 %

42 www.bi.go.id
Internet Source

<1 %

43 www.cluteinstitute-onlinejournals.com
Internet Source

<1 %

44 www.unescap.org
Internet Source

<1 %

45 www.unidu.hr
Internet Source

<1 %

46 www2.deloitte.com
Internet Source

<1 %

Exclude quotes   Off   Exclude matches   Off