Research Article

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The Influence of GDP, Third Party Funds, and Non-Performing Loans on Credit Procyclicality Behavior in Government Banks

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Abstract: *This research aims to determine the influence of GDP, Third Party Funds, and Non-Performing Loans on credit procyclicality behavior at Government Banks. The method and analytical tools used in this research are panel data regression with the dependent variable, namely Credit, and the independent variables, namely GDP, Third Party Funds, and Non-Performing Loans. The scope of this research is BUMN Banks with a time span of 2017-2022. This research shows that the best model chosen is the Fix Effect Model with the results that GDP, Third Party Funds and Non-Performing Loans have a positive and significant effect on credit distribution, which shows that there is procyclical behavior in government banks.*

Keywords*: third party funds, GDP, credit, non-performing loans, procyclicality.*

Introduction

One sector that is able to develop rapidly and can support the national economy as well as play a major role in national development is banking. Banks are business entities that collect funds from the public in the form of savings and distribute them to the public in the form of credit and/or other forms in order to improve the standard of living of many people.

The role of banks in lending is to increase the capital needed by the community to strengthen its capital structure. Credit distribution that follows a cycle will give rise to procyclicality problems. Bank procyclicality is excessive bank credit distribution, which accelerates economic growth when the economy is in a state of expansion, and too few credit channels, so that when the economy is in a state of contraction it will slow down economic growth (Bank Indonesia, 2014).

Banking procyclical behavior is generally accompanied by an increase in risk taking behavior in credit distribution which can be identified by the risk of an imbalance between credit distribution and economic needs. Problems in procyclicality are based on indicators of economic needs and indicators of imbalance in banking credit distribution (Bank Indonesia, 2014).

**Table 1.** Results of Credit Procyclicality Detection Testing at Government Banks for the Period Q1:2017 – Q4:2022

Year	Quarter	GDP	Credit	Ratio	Trends *HP-Filter*	Gap
2017	Q1	2,378,146	1,768,084	0.7435	0.7372	0.0063
	Q2	2,473,513	1,815,547	0.7340	0.7485	-0.0145
	Q3	2,552,297	1,836,816	0.7197	0.7599	-0.0402
	Q4	2,508,972	1,950,423	0.7774	0.7712	0.0061
2018	Q1	2,498,698	1,937,788	0.7755	0.7826	-0.0071
	Q2	2,603,853	2,053,484	0.7886	0.7938	-0.0052

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	Q3	2,684,332	2,115,925	0.7883	0.8050	-0.0168
	Q4	2,638,970	2,222,462	0.8422	0.8161	0.0261
2019	Q1	2,625,181	2,209,603	0.8417	0.8270	0.0147
	Q2	2,735,414	2,314,113	0.8460	0.8377	0.0083
	Q3	2,818,813	2,344,586	0.8318	0.8482	-0.0164
	Q4	2,769,748	2,406,885	0.8690	0.8584	0.0106
2020	Q1	2,703,033	2,445,406	0.9047	0.8684	0.0362
	Q2	2,589,789	2,395,762	0.9251	0.8782	0.0469
	Q3	2,720,492	2,407,889	0.8851	0.8877	-0.0026
	Q4	2,709,741	2,431,128	0.8972	0.8969	0.0003
2021	Q1	2,684,201	2,469,419	0.9200	0.9059	0.0140
	Q2	2,772,939	2,524,867	0.9105	0.9148	-0.0043
	Q3	2,815,870	2,552,411	0.9064	0.9236	-0.0171
	Q4	2,845,859	2,600,599	0.9138	0.9323	-0.0184
2022	Q1	2,819,333	2,656,897	0.9424	0.9409	0.0015
	Q2	2,924,441	2,768,253	0.9466	0.9495	-0.0029
	Q3	2,977,925	2,793,284	0.9380	0.9580	-0.0200
	Q4	2,988,549	2,871,729	0.9609	0.9666	-0.0057

Source: Central Statistics Agency (processed).

The results of procyclicality identification carried out in the period Q1:2017 – Q4:2022 found that Government Banks experienced procyclicality. This can be seen from the gaps with positive and negative values in table 1. Gaps with positive values reflect that the amount of bank credit disbursement is excessive, while gaps with negative values reflect that the needs of the economy are more dominant than the amount of credit disbursement.

Figure 1. Movement of GDP Growth and Credit Growth for the period Q1:2017-Q4:2022.
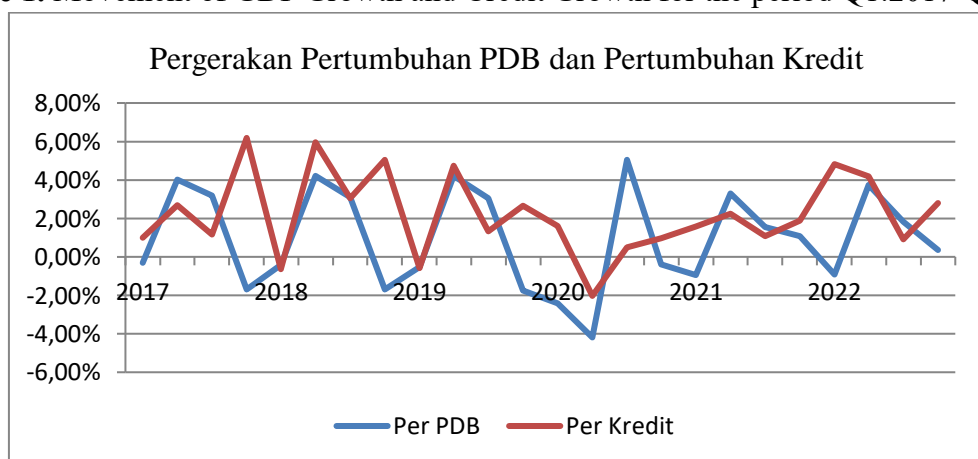

Source: Central Statistics Agency (processed).

Based on Figure 1 above, it shows that GDP growth and credit growth are very fluctuating. Boediono (2001) states that GDP growth has an impact on the liquidity of credit distribution provided by banks. In theory, when GDP increases there will be an increase in economic transactions and the banking business

world, so that GDP growth has an impact on credit distribution provided by banks. Based on previous research, the research results of Utari et al (2012) which are in accordance with research (Ramelda, 2017) state that Gross Domestic Product (GDP) has a positive and significant effect on credit distributed, resulting in procyclicality.

Excessive procyclicality will cause problems. The risks fostered during the boom period are realized in the economic downturn. Banking behavior that underestimates risk when economic conditions are good also has the potential to overestimate risk when conditions decline. This condition can get worse if policy makers are late in responding to developments occurring in the financial sector and policies tend to be procyclical. The results of empirical studies in several developing countries and OECD countries show that high credit growth and ballooning asset prices generally precede a downturn in the business cycle. As was the case with Indonesia, the 1999 crisis period in Indonesia was preceded by a quite sharp increase in credit (Craig et al., 2006).

Figure 2. Movement of Credit Growth and DPK Growth for the period Q1:2017-Q4:2022.
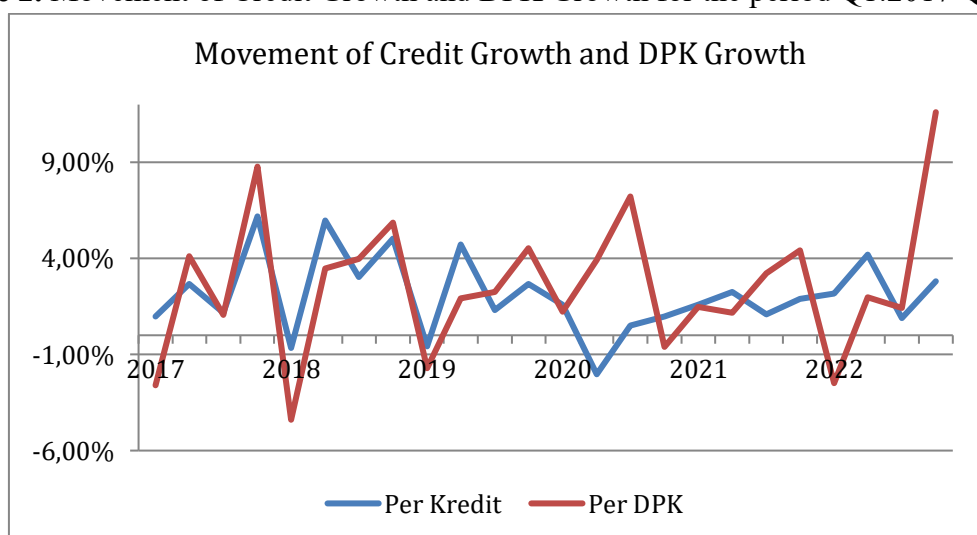
Source: Financial Services Authority (OJK) (processed).

Overall, during the 2017-2022 period, state banks in Indonesia experienced very fluctuating growth in deposits and credit, including in facing economic challenges during the Covid-19 pandemic. In 2021, deposit growth will begin to increase again, although it is still in the post-pandemic recovery stage. This growth reflects strong public trust in state banks as well as an effective strategy in raising funds from various sources.

According to (Dendawijaya, 2005), the greater the public funds collected by banks, the greater the amount of credit distributed, because the lower the credit distributed, it will cause procyclical behavior. Based on previous research, according to research (Hasyim, 2015) it has been concluded that third party funds have a positive and significant effect on procyclicality behavior. Different results were shown in previous research according to (Juliannisa, 2017) that third party funds had a negative and insignificant effect on credit volume, causing procyclical behavior.

Figure 3. NPL Movement in Government Banks for the period Q1:2017-Q4:2022.
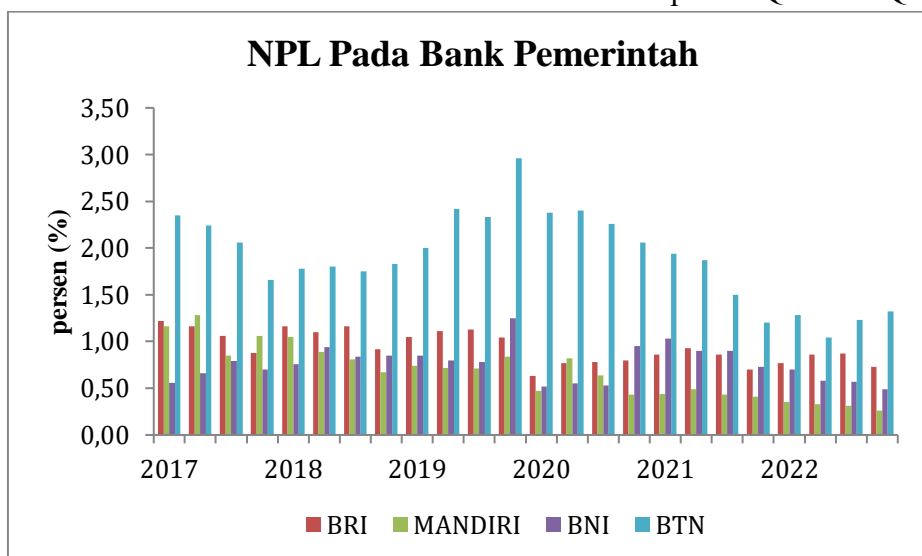
Source: Financial Services Authority (OJK) (processed)

Based on figure 3 above, it can be seen that BTN is the bank that has the highest NPL value among other government banks with the highest value being 2.96% in the 4th quarter of 2019, and the lowest NPL value of 0.26 percent is at Bank Mandiri in the 4th quarter. in 2022. Non-Performing Loans (NPL) are non-performing loans. This problem credit is caused by cash turnover that is not smooth, so the bank can experience losses.

The structure of the financial system, which includes the presence of government-owned banks, is thought to influence the procyclicality of the banking sector. The existence of state banks can have a positive or negative impact on procyclicality depending on the timing and conditions of the banking sector as a whole. Government banking, which generally has a function as an agent for economic growth, will continue to strive for credit distribution in declining economic conditions, so as to reduce procyclical effects.

Government banks are also known to carry out a lot of connected lending, namely credit distributed to certain parties related to public projects by prioritizing risk aspects. When economic conditions are weak, if the government prioritizes lending to companies or government projects, the allocation of credit to the private sector is reduced, resulting in worsening procyclical effects. A significant impact on financial system stability occurs if the government has to bail out government banks that default due to connected lending (Warjiyo, 2004).

Method

Types of Research and Data Sources

This research is a type of quantitative descriptive research using secondary data. Secondary data is a source of research data obtained indirectly or data obtained by researchers from various existing sources. In this research, the data used is panel data. Panel data is cross-sectional time series data, where there are four government banks that are the object of research, namely Bank Rakyat Indonesia, Bank Negara Indonesia, Bank Mandiri, and Bank Tabungan Negara with the time span used being quarterly, namely from the 1st quarter of 2017 to the 4th quarter. in 2022. Secondary data used in this research was processed from the official website of the Financial Services Authority (www.ojk.go.id) and the Central Statistics Agency (www.bps.go.id).

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Data analysis method

The analytical method used in this research is the panel data regression method (Panel Data Regression Analysis). Panel data is formed from a combination of time series units from several data units, thus forming a data collection. The panel data regression method is able to provide more data so that it will produce a greater degree of freedom (Widarjono, 2013). Panel data can explain both time series and cross section variables, substantially reducing the problem of omitted variables (removal of irrelevant variables). This method is more appropriate to use to overcome intercorrelation between independent variables which in the end can ignore inaccurate regression estimates (Gujarati, 2003).

Panel data regression is a technique of combining cross section and time series data. In panel data model analysis, three approaches are known, consisting of Simple/General Effects (Common Effect Model), Fixed Effects (Fixed Effect Model), and Random Effects (Random Effect Model).

The regression model in this research is as follows:

$$LnKredit_{it} = \beta_0 + \beta_1 LnGDPriil_{it} + \beta_2 LnDPK_{it} + \beta_3 NPL_{it} + e_{it}$$

Information

Credit	= Credit disbursed by the bank (millions of rupiah)
GDPriil	=Real Gross Domestic Gross (millions of rupiah)
DPK	= Third Party Funds (millions of rupiah)
NPLs	= Non-Performing Loans (%)
i	= shows cross-section data.
t	= shows the time series dimension.
β0	= Constant (intercept).
β1, β2, and β3	=Regression coefficient.
eh	= Error term.

Results and Discussion

Descriptive Statistical Analysis

Table 2. Descriptive Statistics on 4 Government Banks

	LNKREDIT	LNGDP	LNDPK	NPLs
Mean	20.05483	14.80776	20.15402	1.068750
Median	20.22937	14.81112	20.34221	0.875000
Maximum	20.75263	14.91030	20.98623	2.960000
Minimum	18.85812	14.68183	18.79745	0.260000
Std. Dev.	0.548476	0.057646	0.600161	0.578050
Skewness	-0.731707	-0.167045	-0.828318	1.194681
Kurtosis	2.150686	2.518252	2.472102	3.753959
Jarque-Bera	11.45166	1.374788	12.09247	25.11001
Probability	0.003261	0.502885	0.002367	0.000004
Sum	1925.264	1421.545	1934,786	102.6000

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Sum Sq. Dev.	28.57844	0.315689	34.21835	31.74345
Observations	96	96	96	96

Source: Processed data from E-views12, 2024

Based on table 2 above, it can be seen that the observations used in this research amounted to 96 observations sourced from 4 government banks in 2017-2022. A descriptive explanation of the results of each variable is as follows:

1. Credit distribution to government banks shows an average (mean) value of 20.05438 percent, the highest credit was 20.75263 percent at BRI bank in the 4th quarter of 2022 and the lowest credit was 18.85812 percent at BTN bank in the 1st quarter of 2017 .
2. GDP in Indonesia has an average (mean) value of 14.80776 percent with the highest GDP value of 14.91030 percent in the 4th quarter of 2022 and the lowest GDP of 14.68183 percent in the 1st quarter of 2017.
3. DPK at state banks has an average (mean) value of 20.15402 percent, with the highest DPK at 20.98623 percent at BRI bank in the 4th quarter of 2022, and the lowest DPK at 18.79745 percent at BTN bank in the 1st quarter of 2022. 2017. Then for NPLs in government banks, the average value (mean) was 1.06875 percent. The highest NPL value of 2.96 percent was at BTN bank in the 4th quarter of 2019, and the lowest NPL value of 0.26 percent was at Mandiri bank in the 4th quarter of 2022.

Selection of Panel Data Regression Estimates

Table 3. Chow Test Results

Effects Test	Statistics	df	Prob.	Decision
Cross-section F	64.979545	(3.89)	0.0000	*Fixed Effect Model*
Chi-square cross-section	111.371690	3	0.0000	

Source: Processed data from E-views12, 2024

The Chow test which was carried out using E-views shown in table 3 obtained results that showed a probability value of 0.0000 or less than the significant level (α) = 0.05, so H0 was rejected so that the best model that could be used based on the Chow test was the Fixed Effect Model.

Table 4. Hausman Test Results

Test Summary	Chi-Sq. Statistics	Chi-Sq. df	Prob.	Decision
Random cross-section	178.942704	3	0.0000	Fixed Effect Model

Source: Processed data from E-views12, 2024

The Hausman test which was carried out using E-views shown in table 4 obtained results that showed a probability value of 0.0000 or less than the significant level (α) = 0.05, so H0 was rejected so that the best model that could be used was based on the Hausman test, namely the Fixed Effect Model.

Panel Data Model Regression Estimation Results

After testing using the Chow Test and Housman Test, the results were obtained that the best model that can be used to evaluate the data in this research is using the Fixed Effect Model.

**Table 5.** Panel data estimation results using the Fixed Effect Model

Variables	Coefficient	Std. Error	t-Statistics	Prob.
C	-6.059438	1.332909	-4.546025	0.0000
LNGDP	1.157250	0.127450	9.080048	0.0000
LNDPK	0.442477	0.040780	10.85033	0.0000
NPLs	0.056431	0.015911	3.546557	0.0006
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.995456	Mean dependent var		20.05483
Adjusted R-squared	0.995149	SD dependent var		0.548476
SE of regression	0.038200	Akaike info criterion		-3.621849
Sum squared resid	0.129871	Schwarz criterion		-3.434865
Log likelihood	180.8487	Hannan-Quinn Criter.		-3.546267
F-statistic	3249.270	Durbin-Watson stat		1.066017
Prob(F-statistic)	0.000000			

Source: Processed data from E-views12, 2024

Normality test

Figure 4. Normality Test Results
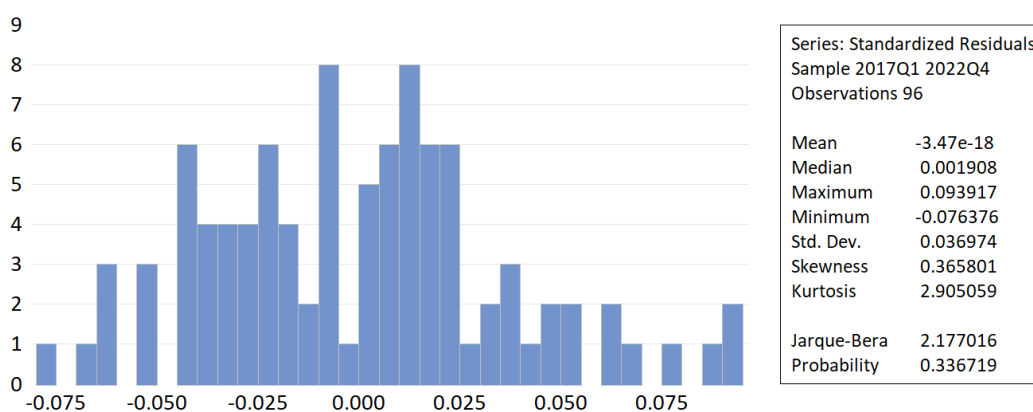
Source: Processed data from E-views12, 2024

Figure 4 above shows that the probability value in the normality test is 0.3367 or greater than 0.05, thus indicating that the data is normally distributed.

Multicollinearity Test

Table 6. Multicollinearity Test Results

	LNGDP	LNDPK	NPLs
LNGDP	1,000000	0.273356	-0.246189

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LNDPK	0.273356	1,000000	-0.823777
NPLs	-0.246189	-0.823777	1,000000

Source: Processed data from E-views12, 2024

Table 6, the results of the multicollinearity test, shows that the three independent variables GDP, DPK, and NPL do not have values that exceed 0.80, so it can be concluded that there is no linear relationship between each independent variable used in this research or does not show multicollinearity.

Heteroscedasticity Test

Table 7. Heteroscedasticity Test Results

Variables	Coefficient	Std. Error	t-Statistics	Prob.
C	1.212369	0.742180	1.633523	0.1059
LNGDP	-0.113088	0.070966	-1.593557	0.1146
LNDPK	0.024046	0.022707	1.058962	0.2925
NPLs	0.006748	0.008860	0.761686	0.4483

Source: Processed data from E-views12, 2024

Table 7 results of the Heteroscedasticity test using the Glejser test shows that the value of each independent variable GDP, DPK and NPL is greater than 0.05 (>0.05) so that the regression model uses the Fixed Effect Model (FEM) which is used in the research This has no indication or is free from heteroscedasticity.

Hypothesis test
Individual Parameter Significance Test (T-Test)

Table 8. T-Statistics Test Results

Variables	t-Statistics	t-table	Prob.	Conclusion	Information
LNGDP	9.080048	1,661	0.0000	H0 is rejected	Significant
LNDPK	10.85033	1,661	0.0000	H0 is rejected	Significant
NPLs	3.546557	1,661	0.0006	H0 is rejected	Significant
C	-4.546025	1,661	0.0000	H0 is rejected	Significant

Source: Processed data from E-views12, 2024

The results of the t - statistical test show that all independent variables GDP, DPK and NPL during 2017 - 2022 in this study have a significant effect on Credit Procyclicality Behavior in Government Banks.

Simultaneous Significance Test (F Test)

Table 9. Statistical F-Test Results

F-table	F-statistics	Prob.	Information
3,095	3249,270	0.000000	H0 is rejected

Source: Processed data from E-views12, 2024

Table 9 shows the results of the F - statistical test which concludes that H0 is rejected because it is known that the Fcount value = 3249.270 or greater than the Ftable value = 3.095 with a probability value

of 0.000000 < 0.05, this shows that the GDP, DPK factors and NPL together have a significant influence on Credit Procyclicality Behavior in Government Banks.

Coefficient of Determination (R-Square / R2)

The R-square value based on the regression results in the FEM model is 0.9955 or 99.55%, this shows that the independent variables consisting of GDP, DPK and NPL are able to explain the dependent variable, namely Government Bank Credit of 99.55%, Meanwhile, 0.45% is explained by other variables not used in this study.

Discussion

The results of panel data estimation using the Fixed Effect Model (FEM) approach obtained the following regression equation results:

$$\text{Ln Kredit}_{it} = 0.0023 + 1.1573 \text{ Ln GDP}_{it} + 0.4425 \text{ Ln DPK}_{it} + 0.0564 \text{ NPL}_{it}$$

Based on the regression results, the GDP coefficient value is 1.157250 and the probability is 0.0000. The results of this research show that at $\alpha = 5\%$, GDP has a positive and significant impact on government bank credit distribution. This means that if GDP every quarter from 2017 - 2022 increases by 1%, then credit disbursed will increase by 1.1573% assuming other variables remain constant (ceteris paribus).

The results of this research are in accordance with the initial hypothesis which suspected that if there was an increase in GDP, the credit disbursed would increase resulting in an increase in procyclical behavior in State Banks. This is in accordance with previous research conducted by Himma, Faiqotul (2019), Utari et al (2012), and Ramelda (2017) which found a positive and significant relationship between GDP and bank procyclical behavior, due to unidirectional movements in GDP. and credit distributed by banks, resulting in procyclicality.

Based on the regression results, the DPK coefficient value is 0.442477 and the probability is 0.0000. The results of this research show that at $\alpha = 5\%$, TPF has a positive and significant impact on government bank credit distribution. This means that if deposits each quarter from 2017 – 2022 experience an increase of 1%, then credit distribution reflecting procyclical behavior will increase by 0.442477% assuming other variables remain constant (ceteris paribus).

When deposits increase, it can trigger greater credit disbursed by state banks so that when the economy is growing, it will give rise to banking procyclicality. In line with theory, the greater the public funds collected by banks, the greater the amount of credit disbursed (Kasmir, 2013).

This is in accordance with research by Hasyim (2014) which shows that third party funds (DPK) have a positive and significant effect on disbursed credit, causing an increase in banking procyclical behavior.

Based on the regression results, the NPL coefficient value is 0.0564 and the probability is 0.0006. The results of this research show that at $\alpha = 5\%$, NPL has a positive and significant impact on government bank credit distribution. This means that if the NPL every quarter from 2017 - 2022 increases by 1%, then the credit disbursed will increase by 0.0564% assuming other variables remain constant (ceteris paribus).

The NPL coefficient which has a positive value indicates that it is not in accordance with the initial hypothesis in this research that NPL has a negative and significant effect on procyclical behavior in Government Banks. This result is not in accordance with the theory that the higher the NPL level, the lower credit distribution will be. This means that even though the NPL level increases, the level of credit

distribution will also increase, this is because the NPL that occurs at Government Banks still has not exceeded the maximum limit determined by Bank Indonesia, namely 5%. So even though the NPL that occurred in 2017-2022 has increased but is still below the regulatory limit, credit distribution to government banks will also continue to increase.

The results of this research are supported by the results of previous studies conducted by Oktaviani (2012), (Nurwisata & Mahfud, 2015), (Trimulyanti, 2014), (Runtulalo et al., 2013) which found that NPL had a positive and significant effect on amount of credit distribution.

Conclusion

Based on the results of this research, it can be concluded as follows:

1. GDP has a positive and significant effect on procyclical behavior in Government Banks, amounting to 1.157250. This means that an increase in GDP will be followed by an increase in credit distribution, which will increase procyclical behavior.
2. DPK has a positive and significant effect on procyclicality behavior in Government Banks, amounting to 0.442477. This means that an increase in deposits will be followed by an increase in credit distribution, which will increase procyclical behavior.
3. NPL has a positive and significant effect on procyclical behavior in Government Banks, amounting to 0.056431. This shows that even though the NPL increases in government banks, the credit disbursed continues to increase so that procyclical behavior decreases.
4. GDP, Third Party Funds, and Non-Performing Loans (NPL) together have a positive and significant effect on procyclical behavior in Government Banks.

References

Athanasoglou, P., & Daniilidis, I. (2011). Procyclicality in the banking industry: causes, consequences, and response. In Bank of Greece, Working Paper (Issue October).

Bank Indonesia. (2014a). Kajian Stabilitas Keuangan No. 23 September 2014. 15(2).

Berger, A. N., & Udell, G. F. (2002). The Institutional Memory Hypothesis and the Procyclicality of Bank Lending Behavior. Finance and Economics Discussion Series, 2002(02).

Bernanke, B. S., Gertler, M., & Gilchrist, S. (1999). The financial accelerator in a quantitative business cycle framework. In Handbook of Macroeconomics.

Gujarati, D. N. (2012). Dasar-Dasar Ekonometrika, Edisi 5. In Jakarta: Salemba Empat.

Hasyim, D. (2015). Faktor-Faktor yang Mempengaruhi Penyaluran Kredit pada Bank Umum Periode 2008-2012. JUPIIS: Jurnal Pendidikan Ilmu-Ilmu Sosial, 6(2).

Juliannisa, I. A. (2017). Faktor-Faktor Yang Memengaruhi Volume Kredit Yang Berdampak Pada Prosiklikalitas: Studi Kasus Bank Domestik Dan Asing di Indonesia. Bina Ekonomi, 21(2), 93–104.

Nugraha, A. P., Mulyadi, M., & Suriani, S. (2024). Customer Journey Mapping: Understanding Consumer Behavior Digitally. Berajah Journal, 4(2), 327-336.

Oktaviani, I. R. D. P. (2012). Pengaruh DPK, ROA, CAR, NPL, dan Jumlah SBI Terhadap Penyaluran Kredit Perbankan (Studi Pada Bank Umum Go Public di Indonesia Periode 2008-2011). Diponegoro Journal of Management, 1(2).

Utari et al. (2012). Prosiklikalitas Sektor Perbankan Dan Faktor-Faktor Yang Mempengaruhi. Badan Pendidikan Dan Pelatihan Keuangan, 5.

Widarjono, A. (2013). Ekonometrika: Pengantar dan aplikasinya, Ekonosia. Yogyakarta: Penerbit YKPN.