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Economic Conditions and Lending Behavior; Evidence From The Regional Development Banks in Indonesia

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Abstract: Using RDB data panels during the period 2001-2015, this study examines whether regional, national and international economic conditions affect lending behavior of RDB in Indonesia. This study finds evidence for impact of economic conditions at international, national and regional level. This Research found that national economic conditions and inflation at the regional level play an important role in determining the credit behavior of RDB banks.

Keywords: Economic Condition, Lending Behavior and Regional Development Banks

I. INTRODUCTION

1.1. Background

The main performance of the bank is increasing the bank's profits from the implementation of bank intermediation function. The intermediation function of banks is to channel funds collected by the third party bank and then distributed in the form of credit. Of these functions, the bank will make a profit. But the behavior of banks in lending influenced by economic conditions. GDP (Gross Domestic Product) is the macroeconomic variables that describe the country's economic conditions. GDP is used to measure the productive activity within a country. GDP will affect the functioning of bank intermediation. But GDP is an external variable that cannot be controlled by the bank so that macroeconomic policies made by governments determine the performance of the bank. As economic activity increases, requiring additional funding, banks can provide these funds so that the loan portfolio of the bank also increased, nor vice versa. Bucher et al., (2013) describes the macroeconomic policy has an important role for financial stability and bank performance improvement.

The behavior of banks in lending do not only influence regional economic conditions alone. The liberalization of the economy, bank credit behavior is also influenced by national and international economic

conditions. At the regional level, the decline in regional economic growth is followed by a decline in bank lending; although on certain loans have increased lending. For example in the area of Java and Jakarta Regions the highest increase happend, especially in the trade sector, while in Central Sumatra it happend to the agricultural sector and processing industry (Bank Indonesia, 2013). Despite the slowdown or increase will be followed by a decrease or increase lending, not only in Indonesia, the study results Bebczuk, et al (2010) in 144 countries in Europe, America and Asia Pacific find national economic conditions characterized by a positive relationship, where the increase or a decline in GDP will be followed by an increase or decrease in lending. The same is found by Pontines and Siregar (2012) in the ASEAN region and Guo and Stepanyan (2011) in 38 developing countries.

At International level, global economic conditions that marked the 2008 financial crisis in the United States gave an impact on the behavior of credit in various countries including in Indonesia although the impact appears primarily on foreign-owned banks. Allen et al (2013), which examine the foreign-owned banks and government property in Central and Eastern Europe, found that foreign banks in host countries reduce the current credit crisis. The same was found in the ASEAN Region (Pontines and Siregar: 2012). Kotz (2010) explained that due to the liberalization of trade and international capital markets has gone hand in hand, in line with increased economic integration at the global level. Internationalization of banking activities naturally has contributed to the bank itself due to the universal impulse toward economic integration between countries. Global integration has paved the way for other countries to transfer how to run an international standard banking activities. The goal is to become more efficient in the use of resources. But at the same time, financial integration also facilitates the transmission of shocks across countries. As a result, when a crisis occurs in a country it will have an impact on other countries.

Using RDB data panels during the period 2001-2015, this study examines whether local, national and international economic conditions affect lending behavior of RDB in Indonesia. Economic conditions are seen from three main variables, namely the international economic condition (measures of the global financial crisis periode 2008-2009), national and regional economic conditions that measures of productivity of the economy (Gross Domestic Product and Gross Regional Domestic Product) and inflation rate (Inflation rate at national and regional levels). This study also use control variables that include bank-specific (interes rate, size of bank, profitability, liquidity, capital and risk).

1.2. Outcomes & Contributions

RDB has a unique position with operations located predominantly in the area so that regional economic conditions largely determine the behavior of bank credit. But with the economic liberalization that is happening now, the limit-restriction area will no longer be an obstacle to the bank in carrying out its functions, national and international economic conditions could affect the behavior of RDB. This study specifically aims to invstigate the impact of economic conditions on the behavior of credit RDB. Specifications performed on variable economic conditions includes not only national and international economic conditions (Pontines and Siregar: 2012, Allen *et al*: 2013 and De Haas and van Lelyveld: 2014), but also regional economic conditions. This is because as the object of this research RDB has a dominant working areas at regional level, in contrast to other commercial banks which have dominant working areas on a national level even they have regional branches. In addition, this study also involves internal factors that can figure out lending behavioral changes of RDB.

II. STUDY REFERENCES

2.1. Lending Behavior Determinant

Bank in their function as an intermediary institution plays an important role in supporting the economic growth of a country through increased national income. Raising funds from the public and channeling these funds into sectors of the economy will be able to encourage the movement of businesses that can affect the national income. This condition causes the behavior of bank credit behavior becomes especially important to be studied, especially if associated with economic conditions. GDP is one of the indicators used to determine the condition of the economy of a country. When a country increases GDP growth, reflecting the country's economy is in good shape. Good economic conditions spur banks to increase lending to the public.

The relationship between economic conditions with existing credit behavior based on Modigliani and Miller's theorem (1958) which states that the ties between the financial sectors by now where the economy is not relevant (irrelevance finance). Although Bucher, *et al.* (2013) confirmed that the macroeconomic policy has an important role in the bank's financial and economic stability. The instability of the bank's performance is affected by the ups and downs of economic conditions so that economic stability is needed. This is because the stability of banks and credit dynamics associated with internal and external funding problems of banks, which is an important driver in the business cycle. Thus, a credible macro policy can make an important contribution to the stability of bank performance.

The financial crisis is a symptom of instability conditions form of economic fluctuations that are too big for a long time and continuously. The condition can affect the behavior of bank credit. De Haas and Lelyveld (2014) suggests that the global economic crisis and significant negative effect on the growth of credit. This means that with the global economic crisis impact on the growth of bank credit. So that the behavior of banks is more likely to decrease its lending so that credit growth will also decrease. Although Pontines and Siregar (2012), Allen, *et al.*, (2013), and Gambacorta and Marques-Ibanez (2003) found different results where the global economic crisis and significant negative effect on the growth of credit, which indicates that the crisis did not affect the lending, but banks tend to keep lowering the amount of lending. Fungáčová *et al.* (2013) which examines bank in Russia found the same results, which the state-owned banks increase lending during the financial crisis took place.

Not only at the international level, have the economic conditions at the national level also had implications for bank lending. Micco and Panizza (2006) examine the economic conditions interacted with bank ownership to the behavior of bank credit. The study found that GDP growth positively and significantly increases bank lending. In addition, the bank also discovered that the government was not responsive to shocks than macroeconomic foreign and domestic banks. GDP is expected with positive results against lending. This indicates increasing economic growth in the loan will be increased as well. Results of research Dinc (2005), Chen and Wu (2014), Guo and Stepanyan (2011), Joen *et al.* (2006) and Allen *et al.* (2013) which showed GDP showed positive results and significant showed similar results on real GDP growth of the loan portfolio. On Molyneux *et al.* (1998) Log GDP was also negative but not significant effect on lending.

Variable inflation and interest rates also have an impact on lending. Inflation is one of the economic indicators that should be considered in the investment process. High inflation led to high bank interest

rates, so as to increase the amount of non-performing loans and weak internal condition of the bank. A relation with the behavior of credit inflation is negative, which means the increase in inflation will reduce bank lending. Allen *et al.* (2013) found a significant negative sign between inflation and credit growth. While on a variable interest rate, the higher the interest rates on loans in a country, then declining credit demand in the country. This happens because of the high interest rate it will be more burdensome to the customer, where the burden of borrowing costs to be borne too great. Indirectly also affect the flow of return which is not smooth. As a result, banks have to bear high credit risk because many loans were problematic. Ferri, *et al.* (2014) and Pontines and Siregar (2012) found that interest rates significant negative effect on bank lending.

2.2. Bank Specific Determinants

Not only economic conditions, bank specific variables also determine the behavior of bank credit as liquidity, profitability, and size of the bank, risk and capital. Liquidity the results showed a positive and significant impact on lending (Chen and Wu, 2014; Choi, *et al.*, 2013; Gambacorta and Marques-Ibanez, 2003; and Pontines and Siregar, 2012). For profitability, Pontines and Siregar (2012), Chen and Wu (2014) and Allen *et al.* (2013) found a significant and positive result. Different results indicated the size of the bank in which previous studies had found their bank size have a positive impact significantly (Gambacorta and Marques-Ibanez, 2003 and Joen *et al.*, 2006) and a significant negative (Chen and Wu, 2014 and Pontines and Siregar, 2012) The same thing was found in the variable Solvency, where Allen *et al.* (2013), Chen and Wu (2014), Choi, *et al.* (2013) Fungáčiová et al (2013) and Gambacorta and Marques-Ibanez (2003) found a positive sign significantly while De Haas and Lelyveld (2014) and Pontines and Siregar (2012) found a significant negative sign. Lastly, the risk variables found significant negative (Pontines and Siregar, 2012 and Guo and Stepanyan, 2011).

III. RESEARCH METHODS

3.1. Emperical Model

The research model in the study adapts Pontines and Siregar (2012), Allen et al (2013) and De Haas and van Lelyveld (2014). But in contrast to previous studies, this study involves a variable of regional economic condition. The research model is divided into four models. Model I and II are used to capture the impact of international and national economic conditions on lending behavior of RDB. Measurement international economic conditions use conditions when the global financial crisis of 2008-2009 in the form of dummy variables (De Haas and van Lelyveld, 2014). Model III and IV are used to capture the impact of international and regional economic conditions on lending behavior of RDB. The proxi of the economic conditions at the national level using Indonesia GDP Growth (GDP), while the proxi of the economic conditions at the regional level using the GDRP growth (GDRP) of each bank's home base RDB.

$$LOAN_{i,t} = \alpha + \beta_1 LOAN_{i,t-1} + \beta_2 Crisis_{i,t} + \beta_3 GDP_{i,t} + \beta_4 INF_{i,t} + \varepsilon_{i,t,\dots\dots\dots} \text{ model I}$$

$$LOAN_{i,t} = \alpha + \beta_1 LOAN_{i,t-1} + \beta_2 Crisis_{i,t} + \beta_3 GDP_{i,t} + \beta_4 INF_{i,t} + \beta_5 INTER_{i,t} + \beta_6 SIZE_{i,t} + \beta_7 PROF_{i,t} + \beta_8 LIQ_{i,t} + \beta_9 SOL_{i,t} + \beta_{10} WEAK_{i,t} + \varepsilon_{i,t,\dots\dots\dots} \text{ model II}$$

$$LOAN_{i,t} = \alpha + \beta_1 LOAN_{i,t-1} + \beta_2 Crisis_{i,t} + \beta_3 GDRP_{i,t} + \beta_4 INFReg_{i,t} + \varepsilon_{i,t,\dots\dots\dots} \text{ model III}$$

$$LOAN_{i,t} = \alpha + \beta_1 LOAN_{i,t-1} + \beta_2 Crisis_{i,t} + \beta_3 GDRP_{i,t} + \beta_4 INFReg_{i,t} + \beta_5 INTER_{i,t} + \beta_6 SIZE_{i,t} + \beta_7 PROF_{i,t} + \beta_8 LIQ_{i,t} + \beta_9 SOL_{i,t} + \beta_{10} WEAK_{i,t} + \varepsilon_{i,t} \dots \dots \dots \text{model IV}$$

3.2. Variable Selection

Independent variables used in this study is Lending Behavior which is proxied with log natura bank credit (loan) of RDB periode 2001-2015. Independent variables used in this study consists of a variable economic conditions at the international level (Crisis), national (GDP) and regional (GDRP) where the economic conditions at the international level are expected negative effect of national and regional economic conditions are expected positive effect. In additon, also involved other macroeconomic variables, namely inflation (INF and INFReg). Inflation measured by the consumer price index (CPI).

Bank specific variables are also used as control variable. Interes rate is expected negatif. Profitability is proxied with Return on Assets (ROA). Variable profitability is expected positive effect. Solvency measured from the ratio of capital to total assets profitability is expected positive effect. Firm size (SIZE) as measured by log natura total assets. Liquidity is expected positif. So the increase in the four variables (Profitability, Liquidity, Solvency and Size) encourage banks to spand more credit. For credit assessment is proxied ratio Loan Loss Provision in net interest income (Weakness) is expected negative. Operationally the variables in Table 1 as follows:

Table 1
Description of the variables used in the regression models

| <i>Variable</i> | <i>Measure</i> | <i>Expected effect</i> |
|-----------------------------------|--|------------------------|
| Lending Behavior | | |
| Loan | Used to describe the lending behavior of the RDB measured natural logarithm of total loan of banks in the year t | |
| International Economic Conditions | | |
| Crisis | Dummy variable; where 1 = global financial crisis in 2008 and 2009, 0 = others | - |
| National Economic Conditions | | |
| GDPNAS | Growth Gross Domestic Product at Current Market Prices (billion rupiahs). | + |
| INFNAS | the annual inflation rate in Indonesia | - |
| Regional Economic Conditions | | |
| GDRP | Gross Domestic Regional Product at Current Market Prices (billion rupiah) in Indonesia which become <i>home base</i> bank RDB. | + |
| INFREG | The annual inflation rate level regional in Indonesia which become <i>home base</i> bank RDB Measures from the percentage change of the annual Consumer Price Index (CPI). | - |
| Bank specific | | |
| INTER | The interest rate is measured by the interest rate of rupiah loan of working capital by group RDB in year t | - |
| SIZE | Used to describe the size of the bank (economies of scale) measured natural logarithm of total assets of banks in t | + |
| PROF | Profiability is masured by Return on Asset of banks in t | + |

contd. table 1

| <i>Variable</i> | <i>Measure</i> | <i>Expected effect</i> |
|--------------------------|--|------------------------|
| LIQ | Liquidity is masured by credit to third party fund of banks the year t | + |
| SOL | Measuring the strength of the bank's capital. Measured by the ratio of capital to total assets of banks in the year t. | + |
| WEAK | Weakness is masured by is proxied ratio Loan Loss Provision in net interest income of banks in the year t | - |
| α | constants | |
| β_1 - β_{11} | the regression coefficient | |
| ε_{it} | residual value (<i>error</i>) | |

3.3. Data and Tool

The data used are secondary data in the form of banks financial statements that published by Bank Indonesia. While the macroeconomic data used in this study is the annual report data released by Indonesia's Central Statistics Agency (BPS). The analysis tools used in this study is dynamic panel (GMM method). This study estimate all our models using the system GMM estimator to control for possible simultaneity and endogeneity problems in our model (Arellano and Bond, 1991).

IV. RESEARCH RESULTS

4.1. Result and Discussions

Descriptions of all the variables are listed in Table 2. Overall the mean values of all the variables are smaller than the standard deviation except INFReg Variable. This dindng provides information that the mean value of each variable still represents of each variable analyzed. Overall, the variable is a normal distribution variable.

Table 2
Descriptive statistics

| <i>Variable</i> | <i>Mean</i> | <i>Std. Dev</i> | <i>Minimum</i> | <i>Maximum</i> | <i>Obs.</i> |
|-----------------|-------------|-----------------|----------------|----------------|-------------|
| LOAN | 14.5807 | 1.3738 | 10.2128 | 17.8282 | 390 |
| Crisis | 0.1333 | 0.3403 | 0 | 1 | 390 |
| GDP | 16.0012 | 5.3178 | 9.2278 | 25.255 | 390 |
| INF | 7.84867 | 3.8086 | 2.8 | 17.1 | 390 |
| GDRP | 16.6199 | 13.504 | -9.2825 | 165.606 | 390 |
| INFReg | -0.8782 | 19.8688 | -66.457 | 24.0385 | 390 |
| INTER | 15.7286 | 2.4391 | 13.37 | 20.48 | 390 |
| SIZE | 15.2938 | 1.2015 | 12.1047 | 18.234 | 390 |
| Profitability | 3.44332 | 1.2360 | 0.01 | 7.44 | 390 |
| Liquidity | 71.3635 | 26.5266 | 11.06 | 129.59 | 390 |
| Solvence | 0.10771 | 0.0355 | 0.000079 | 0.21456 | 390 |
| Weakness | 0.15754 | 0.12472 | 0.0086 | 1.1124 | 390 |

The relationship between the independent variables showed multicollinearity on the model. Table 3 provides information on the correlation between the independent variables. The matrix shows that in general the correlation between the explanatory variables is not strong, suggesting that multicollinearity problem is not severe.

Table 4 reports the empirical results of the impacts of economic condition and bank-specific on lending behaviour of RDB in Indonesia. The estimation of all models using log natura total loan as the lending behaviour variable.

My estimation results show a stable coefficient, having fairly stable coefficients, while the Wald-test indicates fine goodness of fit and the Sargan-test shows no evidence of over-identifying restrictions. Even though the equations indicate that first-order autocorrelation is present, this does not imply that the estimates are inconsistent. Inconsistency would be implied if second-order autocorrelation was present (Arellano and Bond, 1991), but this case is rejected by the test of AR (2) errors.

Our lagged dependent variable, which measures the degree of persistence of LOAN, is statistically significant across all models, indicating the dynamic character of model specification of lending behaviour. In other words, loan of RDB are a high degree of persistence of lending behaviour and justifying the use of a dynamic model.

The impact of economic conditions on lending behaviour is divided into three as follows, the first economic conditions at the international level using financial crisis variables of 2008-2009, as measured by dummy variables. The coefficient of crisis is positive and no significant for all model. Contrast with expected effect, this result indicates lending behaviour RDB is not affected by the crisis.

The national economy measured by GDP growth. The study found a significant positive impact on GDP growth in the credit behavior RDB (model I). This means that the increase in national economic activity followed by increased growth in lending, nor vice versa. These results are consistent with the expectations expected and in accordance with previous studies (Pontines and Siregar: 2012, Allen *et al*: 2013 and De Haas and van Lelyveld: 2014; Dinc, 2005; Chen and Wu, 2014; Guo and Stepanyan, 2011; and Joen *et al*, 2006). Meanwhile, GDRP has no significant impact on bank credit behavior. In other words, the national economic condition that affects the improvement of bank credit compared to international and regional conditions.

National level inflation has no significant impact on lending behavior. However, regional inflation has a significant and negative impact on lending behavior. This is in line with previous research Allen *et al* (2013) found a significant negative sign between inflation and credit growth. For the variable interest rates, the results in line with expectations is negative and significant, in which an increase in the real interest rate in Indonesia is encouraging banks to behave expansively to boost credit growth. It supports research Ferri, *et al* (2014) and Pontines and Siregar (2012) which found an increase in relation to the interest rate of lending is negative and significant.

Turning to other explanatory variables, bank-specific also affects the lending behavior of banks. In accordance with expectations, only profitability and weakness variable showed no significant results while size, liquidity and solvency variable showed significant results. The study found that size, liquidity and solvency had a positive and significant relationship in all models. These results are consistent with the expectation

Table 3
Correlation Matrix for the Explanatory Variables

| | <i>Crisis</i> | <i>GDP</i> | <i>INF</i> | <i>GDRP</i> | <i>INFReg</i> | <i>INTER</i> | <i>SIZE</i> | <i>PROF</i> | <i>LIQ</i> | <i>SOL</i> | <i>WEAK</i> |
|--------|---------------|------------|------------|-------------|---------------|--------------|-------------|-------------|------------|------------|-------------|
| Crisis | 1.0000 | | | | | | | | | | |
| GDP | 0.2415 | 1.0000 | | | | | | | | | |
| INF | -0.0927 | 0.5137 | 1.0000 | | | | | | | | |
| GDRP | -0.0274 | 0.0798 | 0.0472 | 1.0000 | | | | | | | |
| INFReg | -0.2111 | 0.0459 | -0.2043 | 0.0459 | 1.0000 | | | | | | |
| INTER | -0.2083 | 0.2750 | 0.4658 | -0.1396 | 0.0715 | 1.0000 | | | | | |
| SIZE | 0.0383 | -0.2604 | -0.3289 | 0.0594 | 0.0170 | -0.6154 | 1.0000 | | | | |
| PROF | 0.0465 | 0.1678 | 0.1165 | -0.0437 | -0.0812 | 0.1476 | -0.2880 | 1.0000 | | | |
| LIQ | -0.1201 | 0.3633 | 0.3106 | -0.1241 | 0.1471 | 0.6209 | -0.3806 | 0.0587 | 1.0000 | | |
| SOL | 0.0677 | -0.1368 | -0.1628 | 0.1035 | -0.0752 | -0.3281 | 0.0059 | 0.3843 | -0.4588 | 1.0000 | |
| WEAK | 0.0867 | -0.0388 | -0.0893 | -0.0642 | -0.0353 | -0.2025 | 0.2061 | -0.2676 | -0.1455 | 0.0876 | 1.0000 |

Table 4
GMM estimation

| <i>Explanator Variables</i> | <i>Model I Coefficient</i> | <i>t-Statistic</i> | <i>Model II Coefficients</i> | <i>t-Statistics</i> | <i>Model III t-Statistics</i> | <i>t-Statistics</i> | <i>Model IV t-Statistics</i> | <i>t-Statistics</i> |
|-----------------------------|----------------------------|--------------------|------------------------------|---------------------|-------------------------------|---------------------|------------------------------|---------------------|
| LOAN ₋₁ | 0.9503*** | 0.01094 | 0.2002*** | 0.0376 | 0.93893*** | 0.0092 | 0.21640*** | 0.03395 |
| Crisis | 0.0267 | 0.02720 | 0.0069 | 0.0155 | 0.93893 | 0.0255 | 0.00008 | 0.01464 |
| GDP | 0.0039* | 0.00219 | -0.0008 | 0.0013 | | | | |
| INF | 0.0027 | 0.00297 | 0.0021 | 0.0015 | | | | |
| GDRP | | | | | -0.00068 | 0.0255 | -0.00022 | 0.00037 |
| INFreg | | | | | -0.00126** | 0.0004 | -0.00075*** | 0.00024 |
| INTER | | | -0.0209*** | 0.0078 | | | -0.01531** | 0.00741 |
| SIZE | | | 0.76711*** | 0.0396 | | | 0.76772*** | 0.03801 |
| PROF | | | -0.0005 | 0.0074 | | | -0.00143 | 0.00737 |
| LIQ | | | 0.00845*** | 0.0005 | | | 0.008244*** | 0.00055 |
| SOL | | | 0.58907* | 0.3085 | | | 0.576478* | 0.30197 |
| WEAK | | | 0.09146 | 0.0636 | | | 0.080263 | 0.06107 |
| Wald Test | 10536.42 | | 44564.74 | | 10977.04 | | 44922.42 | |
| Sargan Test ¹ | 123.8332 | | 166.9261 | | 114.0003 | | 152.9446 | |
| AR (1) ² | -7.3359 | | -3.5822 | | -7.0258 | | -3.7622 | |
| | 0.0000 | | 0.0003 | | 0.0000 | | 0.0002 | |
| AR (2) ³ | 0.50984 | | -1.7583 | | 0.20573 | | -1.3046 | |
| | 0.6102 | | 0.0787 | | 0.8370 | | 0.1920 | |

*, **, and *** denote significance at 10%, 5% and 1% levels, respectively

¹The test for over-identifying restrictions in GMM dynamic model estimation

²Arellano-Bond test that average autocovariance in residuals of order 1 is 0 (H0: no autocorrelation)

³Arellano-Bond test that average autocovariance in residuals of order 2 is 0 (H0: no autocorrelation)

that is positive and supports research conducted previously which size, liquidity and solvency had significant positive effect on the behavior of credit (Gambacorta and Marques-Ibanez, 2003 and Joen *et al.*, 2006) as well as solvency (Allen *et al.*, 2013; Chen and Wu, 2014; Choi, *et al.*, 2013; Fungáčiová *et al.*, 2013, and Gambacorta and Marques-Ibanez, 2003).

V. CONCLUSIONS AND RECOMMENDATIONS

5.1. Conclusion

RDB has a regional working area that plays a role in supporting regional economy through credit channeling. This study focuses on the impact of economic conditions at international, national and regional levels. In addition, control variables are also used, namely the specific bank consists of interest rates on loans, bank size, profitability, liquidity, capital and risk.

Using panel data from RDB period 2001-2015, this study provides evidence for the fact that national economic conditions and inflation at the regional level play an important role in determining the credit behavior of RDB banks. In addition, control variables such as size, liquidity and solvency also have a significant impact and are in line with expectations.

5.2. Recommendation

The results suggest that credit expansion by RDB can be improved by maintaining national economic stability and inflation at regional level. Maintaining national economic stability becomes the role of the central government while maintaining the stability of inflation at the regional level into the role of local government. The result of this study can be applied to explore the lending behavior of RDB to optimize the policies of central government and regional government.

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