

# Model for overcoming decline in credit growth (case study of Indonesia with time series data 2012M1-2016M12)

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**Submission date:** 11-Apr-2023 10:51PM (UTC+0800)

**Submission ID:** 2061602963

**File name:** -case-study-of-indonesia-with-time-series-data-2012m12016m12.pdf (159.22K)

**Word count:** 4448

**Character count:** 22943



## Journal of Internet Banking and Commerce

*An open access Internet journal (<http://www.icommercecentral.com>)*

*Journal of Internet Banking and Commerce, December 2017, vol. 22, no. 3*

### **MODEL FOR OVERCOMING DECLINE IN CREDIT GROWTH (CASE STUDY OF INDONESIA WITH TIME SERIES DATA 2012M1-2016M12)**

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#### **Abstract**

The problem in this study is the declining growth in bank lending in Indonesia recently. Related to this problem, this research aims to draw up a model to determine the variables that affect the growth of the bank credit declined. In general, for all models which is used in this study, almost all the variables such as Deposit Growth, lagged GDP Growth, Inflation and lagged BI (central bank) rate consistently significant influence on Credit Growth (2012M1 -2016M12), except Liability to Non-resident Growth is not significant but the sign of regression coefficient is consistent. The recommended model is quite good and can be reliable to recommend a policy to improve credit growth because it is consistent with previous research, logic, supported by a strong banking theory, R2 moderate, not serious autocorrelation problem (best linear unbiased estimator). Almost all variables when tested individually or simultaneously significant. Based on the consideration above, mentioned models can be used as a model for improving credit growth in Indonesia which lately decline.

JEL Classification Numbers: **E58, G21**

**Keywords: Deposit Growth; Liability to Non-resident Growth; Inflasi; BI rate; GDP Growth; Net Interest Margin; Non-Performing Loan; Credit Growth**

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## **INTRODUCTION**

The importance of banks' role in mobilizing the economy has been widely discussed by experts and has been written in several literatures. In essence, the bank plays a role in collecting funds from the community and channeling the funds back to the community in the form of credit or other products. In lending money, bank must consider many factors such as interest rates, inflation, GDP and credit growth and also bank performance conditions such as Net Interest Margin (NIM), Non-Performing Loan (NPL) and bank funding capabilities. The Bank should pay attention to these variables in its credit policy. In order to with such credit the bank can grow, can improve the living standard of society, business performance and encourage economic growth.

Banks will be difficult to develop when credit growth declines as experienced banking in Indonesia from 2012 to 2016. Figure 1 below shows that in 2012, growth of banking loan in Indonesia is around 1.67% per month and its growth trend from year to year has decreased to 0.62% in 2016.

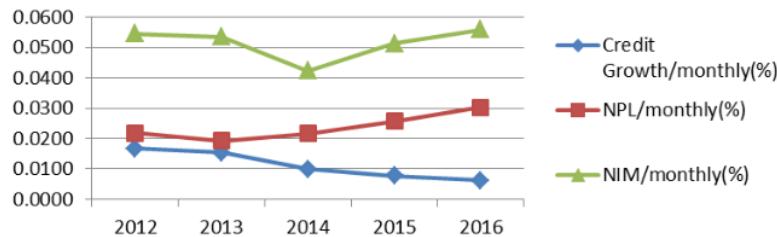
The decline in credit growth is caused indirectly by the increase in non-performing loans (NPL). By banks, loans are classified as not performed if the debtor starts not smoothly pay the installment until the category of stop at all. In the case of Indonesia, from Figure 1 below shows that NPL of bank in Indonesia from 2012 to 2016 has increased. In 2012 NPL per month at that time around 2.18% while in 2016 NPL per month has increased to 3.03%.

According to Bank Indonesia regulation if bank NPLs continue to increase, banks are required to increase the reserves of their earning assets to overcome credit risk. The addition of reserves will reduce the ability of banks in the distribution of credit and will ultimately lower profitability and bank soundness. According to the central bank data, bank profitability measured by ROA (return on asset) in 2012 that is 3.11% and continues to decline to 2.32% in 2016 in line with Increase in NPL and decline in credit growth. As a result Indonesia's economic growth slows down in 2016, especially in September 2016 until December 2016 the growth is negative (decline). In December 2016, real economic growth GDP (constant price 2010) was -1.69%. Although it must be acknowledged this weakness is also due to the influence of not improving economic China, America and Europe and Japan.

The weakening of bank credit growth is partly due to the bank's maintaining Net

Interest Margin, which is a widening savings interest rate and loan interest rate of 4.22% per month in 2014 to 5.99% in 2016 (Figure 1). The likelihood of banks maintaining NIM remains high in the framework of the bank's strategy to withstand an increasing ROA. However, this strategy gives bad effect to the growth of bank credit.

**Figure 1:** Performance of commercial banks.



Controlling the growth of this credit will also be difficult because there is a trade-off. If too fast it is not good because it will increase the NPL, reduce profitability and encourage the economy becomes hotter. As a result disrupt macroeconomic stability as well as increased inflation and current account deficit. If too slow, it will reduce growth. Because this dilemma needs to be balance the potential for conflict that will arise. As a result, banks and the banking community always need to observe the growth of banks, especially credit.

The issue of credit policy as well as its growth is a bank problem that continues to get a lot of attention both from the researchers, owners, managers, investors, borrowers, central banks and other stakeholders. They are trying to solve the related problems surrounding this decision by formulating new theories and models in order to explain the behavior of bank credit and its growth. In fact, for a long time many banking experts and former researchers have expressed this credit problem as a puzzle. In certain areas, a variable is considered to affect credit and growth while in other regions has no effect. On certain areas and certain years have an effect, whereas if examined in other years in the region did not have a significant effect. What changes have occurred in the community? All of these problems or questions need to be resolved through good research.

Related to the problem of this research that is the decreasing of credit growth so that one of main purpose of this research, building model to know the variables that influence the decreasing growth of bank credit in Indonesia.

Until now the debate about credit growth and theoretical model is still unsolved. Much of the debate is based on research on an advanced banking system in the developed country. It is very limited to research this issue in developing countries. Especially in Indonesia, What if the research was done on emerging market like

Indonesia. It should be noted that there are differences in the behavior of financial institutions, especially banks in emerging markets compared to those in developed countries where the banking system is already developed and more liberal [1]. While in developing countries is not possible full liberalization. Consequences as happened in Indonesia after banking deregulation 1983 and 1988. In developing countries debtors are more small companies and medium enterprises, which generally is a company engaged in the informal sector. Unlike in developed countries, debtors are is a mid-sized companies and large business entity in which legality is clearer. As a result, banks will be different behavior in developed countries compared to developing countries such as Indonesia in credit disbursement. If lending money too much emphasis on security and legality of it will resulted lack of credit channeled and only a few companies that get credit .Too loose lending will cause the number of troubled loans.

Unlike in the developing countries, there are easier in the selection of debtors in developed countries because debtor whose legal status is clearer and the information needed easier to find. Besides large number of depositors and amount saved and then market information widely available and easy to obtain. As a result the cost of funds is lower compared to developing country. So that credit growth can be increased to the level of security which is better than in the developing countries. Because of these differences is one of consideration and encouraging doing this research about credit growth and its problems in Indonesia.

The question is what are the factors that need to be considered in order to formulate a model of credit growth in Indonesia that has declined recently? What had been done in other countries, especially in developed countries are not necessarily appropriate in Indonesia. Fully imitating what banks in other developing countries may not be suitable. As for what Bank Indonesia had done in the past is not necessarily appropriate in the present .So that this study will conduct a review of literature as a reference to select the variables to be used as a model. The model proposed to solve the problems above and make recommendation to Bank Indonesia with Tatum Blaise Pua Tan [2], Kai Guo and Vahram Stepanyan [3] model (IMF WP/11/51) which is modified in accordance with the conditions of Indonesia and other literature that supports the model proposed for this study. In summary this study wanted to find out what exactly the factors that influence credit growth in Indonesia which is decline in recent years. So that can provide recommendations for effort to encourage banking credit. Finally banking can contribute to the welfare of society in general.

## **RESEARCH OBJECTIVES**

Based on the background and the problem of credit growth in Indonesia which is decline recently, this study aims to make model to overcome that problem by discuss and test the influence of Deposit Growth, Liability to Non-resident Growth, Inflation, Lagged GDP Growth and Lagged BI (Central Bank of Indonesia) rate to Credit

Growth (2012M1-2016M12) using Kai Guo and Vahram Stepanyan [3] and Tatum Blaise Tan Pua [2] (as model 1: The benchmark specification). Then model 1 was expanded to include NIM (Net Interest Margin) Lagged variables (model 2), NPL (Non-Performing Loan) Lagged variables (model 3), and Credit Growth Lagged variables (model 4) as independent variables to see how they affect the credit growth.

## LITERATURE REVIEW

A lot of the literature on financial institutions that explain the role of bank, according to Mishkin [4] bank has a role as collecting funds from the surplus sector and distributing it back to the public (sector deficit). In carrying out the functions of this institution are governed by the regulations made by the authority which supervise. In distributing funds, financial institutions such as banks must adjust to sources of funds. In banking, it is called by Asset-Liability Management. If it does not match then it will cause problems not only for the bank alone but also for the businesses and the economy will come to feel the bad effects. Therefore, the government and the central bank of a country participate in conducting the supervision and guidance to the banking sector. If all running well, obedient to compliance standards and act cautiously (prudential banking) then all those who get involved will also enjoy. In that situation will arise efficient financial system. Efficient financial system will be able to stimulate the economy and business better and faster than the country's financial system are bad and primitive [5].

The relationship between economic growth and credit growth can be seen from Levine and Zervos [6] study. The study was conducted in 47 countries in 1976-1993 resulted in the conclusion that there is a positive correlation between economic growth and credit growth. They also argue that the dynamics of financial institutions is something that is necessary if a country wants to increase economic growth. Economic growth led to increased demand for credit (credit growth) to finance the business in capturing investment opportunities. Is the growth of financial institutions affected economic growth or economic growth effect on the growth of banking? So to address this problem can be read Corderon research and Liu. Corderon and Liu examine the effect of the development of financial institutions and economic growth in 1960-1994 in 109 countries. The result of this research shows especially the case in developing countries that the economic expansion encouraged the development of financial institutions such as banks and capital markets more liquid.

Another study concerning credit growth can be looked from research done by Iossifov and Khamis. This study found that Lagged GDP per capita, the nominal interest rate, money multiplier and credit expansion by foreign banks to local banks are some of the factors affect to the growth of credit bank of a country. So according to them, if analyze the factors that affect credit growth above variables can be considered. Another researched by Igan and Tamirisa added a net interest margin is an important variable. Because the study found that the net interest margin affect

significantly to the growth of loan growth in Baltics and Central and Eastern Europe in the years 1995-2000 and 2001-2005.

There is also another research which is used as the main reference for this study in building a model to solve the problem of credit growth in Indonesia. That is a researched by Tatum Blaise Pua Tan in Philipin [2] and Kai Guo and Vahram Stepanyan [3] in Emerging Market Economies. However this study slightly modified to suit the conditions of Indonesian banks. So there is a new novelty that augments or replaces other variables from existing models such as the Lagged Bank Indonesia Rate (BI rate), Net Interest Margin (NIM), and the Non-Performing Loan (NPL). BI Rate is the interest rate that reflects the attitude or monetary policy set by Bank Indonesia and announced to the public. BI rate is expected to affect the rate in interest rate of Overnight Interbank Money Market.

Movements in interbank rates are expected to be followed by developments in deposit rates and in turn bank lending rates. So from the model which is used as reference? Lagged deposit rate variables replaced or proxied by Lagged BI Rate. While the addition of Net Interest Margin variable into the model of Kai Guo and Vahram [3] because this variable very rigid to change and the difference is often persist on the high difference .Even the interest rate falls but NIM still persist in the existing level. The research of Tatum Blaise Pua Tan [2] on Philippine concluded that there is a significant negative effect of NIM to the growth of credit there. So, that raises the curiosity, whether this variable significantly influence credit growth in Indonesia. The reasons put NPL because this variable is known to the world of banking and the business in Indonesia when talking about corporate loans increased .Whether increase in NPL has an effect on credit growth decline?. Tatum in his research did not use the NPL but Distressed Asset Ratio (both have the same ratio reflects the quality of assets.) The result shows that this ratio affects the credit growth. This study incorporates elements of Lagged credit growth to see whether the previous period loan growth will affect the current period of growth of bank credit .Because banks usually very cautious in lending. The results in Philipin about this that there is a significant positive effect on the level of 5%.

## METHODOLOGY

### Research Model

This research used a model that used by Kai Guo and Vahram Stepanyan [3] as standard or benchmark model:

$$\text{Credit Growth}_{i,t} = \beta_0 + \beta_1 (\text{Share of deposits in total credit to the private sector}_{i,t-12} \times \text{Deposit Growth}_{i,t}) + \beta_2 (\text{Share of liabilities to non-resident in total credit to the private sector}_{i,t-12} \times \text{Non-resident Liability Growth}_{i,t}) + \beta_3 \text{Inflation}_{i,t} + \beta_4 \text{Lagged GDP Growth}_{i,t-1} + \beta_5 \text{Lagged deposit rate}_{i,t-1} + \epsilon_{i,t} \dots\dots\dots(1)$$

Where  $i$  = observation and  $t$  = time period.

Study of Kai Guo and Vahram Stepanyan [3] found that deposit, liability to non-resident, inflation and GDP has positive influence on credit growth. Whereas deposit rate and the Fed Funds rate negatively affect the credit growth.

This research will use the monthly data time series (January 2012- December 2016) all  $n = 50$ , in contrast to research Kai and Vahram (using Quarterly) [3]. The consideration because almost all the available and complete data for all variables studied was monthly data. Except for GDP data from BPS (Central Bureau of Statistics) and almost all institutions including the central bank uses the data published quarterly. In order all data has the same period then the GDP data will be interpolated by using the Quadratic Match Sum Eviews 6. So the GDP data will be transformed from Quarterly to Monthly data. In this study, Guo and Stepanyan above model then is extended to include other variables such as Net Interest Margin (NIM) for model 2, Non-Performing Loan (NPL) to model 3 and Lagged Credit Growth to model 4.

### **Independent Variable in this study were**

#### **Deposit Growth**

This variable is calculated as the share of deposits in total credit to the private sector  $i,t-12 \times$  Deposits Growth  $i,t$ . Deposits Growth is weighted by Share of total deposits in the total credit for the last 12 months consider the role of domestic deposits as a source of funds [7].

Theoretically, this study expects a positive relationship between deposit growths with credit growth. Increase in deposit growth is expected to expand credit expansion [8].

#### **Liability to Non-resident Growth**

This variable is calculated as the share of deposits in total credit to the private sector  $i,t-12 \times$  Non-resident Liability Growth  $i,t$ . Liability growth here is multiplied by the weight of liability to non-residents on the total credit. So the role of Liability to non-resident the past 12 months (1 year) as a source of funds available for lending in the credit has been taken into account. The relationship between Liabilities to non-resident against credit growth is positive. The greater Liability growth is the greater sources of funds to lend in the form of loans. So the credit growth is expected to increase [7].

#### **Inflation**

The relationship between inflation with loan growth is expected positive. The higher the rate of inflation or nominal prices then demand for credit more increase. So that



loan growth is expected increase [7].

### **Real GDP Growth using constant prices 2000**

Relationship between GDP growths to credit growth is expected to be positive. The higher the GDP growth (the better economic performance) increasing business opportunities/investment means a credit application will increase or growth [7].

Deposit rate replaced or proxied by Bank Indonesia rate-Lagged BI rate [7].

BI rate as a proxy of deposit rate will ultimately affect bank lending rates. Entering the BI-rate variable in the model is a reflection of how monetary policy in a country. The relationship between BI-rate (lagged BI-rate) against loan growth is expected to be negative. Increasing BI-rate (or lagged BI-rate) it will lower credit growth.

### **Net Interest Margin-lagged NIM**

Net Interest Margin in developing countries generally remains rigid and the difference (lending with interest savings rate) is often retained by banks high despite interest rates has gone down. The relationship between NIM with loan growth is expected to be negative. The higher the NIM the business willingness to make loans will decrease. As a result, loan growth is expected will decline [7].

### **Non-Performing Loans-lagged NPL**

NPL reflects the credit quality/asset bank or financial performance of financial system. Increasingly unhealthy (higher NPL), the bank will be more careful in distributing its credit. So that loan growth is expected decline. So the relationship between the two variables is expected to be negative [7].

### **Lagged Credit Growth**

This variable is considered to be influential because appropriate with lagged credit growth cycle. The relationship between lagged credit growths to the credit growth is a direct (positive). If the previous period increases, the estimated credit this year will also increase and vice versa [7].

## **RESULTS**

Following on the tables 1 below is the result of regression of all variables that affect the credit growth. In column 1 are the regression results of the main model (model 1: The benchmark specification). In column 1 are seen all regression coefficients of the variables that affect the credit growth has the same sign as expected (Table 1).

**Table 1:** Regression results for some alternative models.

<b>Private Credit Growth ( 2012M1-2016M12)</b>				
	<b>Model 1 (benchmark specification)</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>
Constant	0.021** (0.006)	-0.01 (0.406)	0.024** (0.024)	0.025** (0.002)
Deposit Growth	0.508 ** (0.000)	0.548** (0.000)	0.513** (0.000)	0.486** (0.000)
Liability to Non- resident Growth	0.339 (0.188)	0.37 (0.175)	0.318 (0.228)	0.366 (0.153)
Inflasi	0.133** (0.036)	0.067 (0.274)	0.111 (0.162)	0.158** (0.016)
Lagged GDP Growth	0.243** (0.004)	0.256 (0.004)**	0.244** (0.004)	0.274** (0.002)
Lagged BI rate	-0.003** (0.007)		-0.003** (0.013)	-0.004** (0.003)
Lagged NIM		0.002 (0.289)		
Lagged NPL			-0.001 (0.637)	
Lagged Credit Growth				-0.136 (0.149)
Anova ( F-test)	16.475**	13.507**	13.570**	14.397**
Adjusted R-Squared	0.567	0.515	0.561	0.576
Durbin-Watson (Autocorrelation test)	2.353 No autocorrelation	2.168 No autocorrelation	2.382 No autocorrelation	2.127 No autocorrelation
Number of Observation	60	60	60	60
*significant at 10% level ** significant at 5% level (...) standard errors are in paranthesis Source data: www.bi.go.id, www.bps.go.id [7]				

All variables have significant effect at the level of 5% to the credit growth, except Liability to Non-resident Growth. The coefficient sign of this variable consistent with the expected that is positive but not significant because the fluctuation of these variables over time during the study period is not much changed. Means during that period, the role of liability to non-resident (obligations to non-residents) as a source of bank funds available to lend in credit is relatively small due to the appreciation of the dollar from \$ 1 = Rp9000 in early January 2012 to Rp.13.500 at the end of the

period 2016. In that period the growth of bank credit relies more on the source of savings from the domestic which is relatively cheaper.

Coefficient of deposit growth and lagged GDP growth is consistent with Kai Guo and Vahram Stepanyan [3] research and Tatum Blaise Pua Tan [2] research in Philipin. This means that this study (undertaken in Indonesia) reaffirms the results of previous research that deposit and GDP growth have a positive effect on credit growth. From model 1, those variables that can be considered as solution variables to increase the weakening credit growth because the coefficients for these two variables are most sensitive and positively significant.

Model 2 (model 1: benchmark specification plus NIM variable) in column 2 of table 1 shows that NIM has no significant effect to credit growth. Although the sign of regressive cosfisien variables is not consistent with the expected, these results indicate something different in Indonesia (credit puzzle). The insignificant NIM indicates that it is a rigidity banking policy. Many banks do not change the width of NIM from time to time even though the deposit interest rate has dropped. NIM is set relatively constant in order to maintain profit when credit growth declines. So NIM has no effect on credit growth. In column 2 of table 1, despite the addition of NIM variables, the regression results for all the significance variables are unchanged compared to benchmark specification model (model 1) except inflation. In this second model BI-rate is excluded from the regression equation to avoid the occurrence of multicolinear between BI-rate with NIM.

Model 3 (model 1: benchmark specification plus NPL variable) in column 3 of table 1 shows even NPL entered into regression equation, all the signs of regression coefficients (except NPL) are still consistent and significant appropriate with the results benchmark specification models (basic models-model 1). It means when lending money banks in Indonesia apparently pay less attention to NPL, Banks are less prudent.

In the last column (the column 4) is a test of the persistence of credit growth. Generally, the relationship between credit growths with credit growth of next period is positive. In other words a period of credit activity will affect the activity next period. But this research found different things (negative coefficient), although not significant.

## **DISCUSSION**

Problem of his research is the decline of growth of bank credit in Indonesia from year 2012-2016. So that the objective of this study to make model to overcome that problem by discuss and test the influence of Deposit Growth, Liability to Non-resident Growth, Inflation, Lagged GDP Growth and Lagged BI (Central Bank of Indonesia) rate to Credit Growth (2012M1-2016M12).In general, almost all variables of all models such as Deposit Growth, lagged GDP Growth, Inflation and Lagged BI

rate consistently have a significant effect on Credit Growth (2012M1-2016M12), except Liability to Non-resident Growth. The variable is not significant but the sign of the regression coefficient is consistent. The above model is good enough and can be trusted to recommend for improving credit growth policy because the result is consistent with previous research, logic, supported by strong banking theory, moderate  $R^2$ , no autocorrelation problem. The best linear unbiased estimator, almost all variable when tested individually or together (simultant) significant. Based on the above considerations, the above model can be used as a model for improving credit growth in Indonesia which has recently declined. Although these variables are beyond the control of policy makers (Bank Indonesia), they can be influenced by regulation, BI rate or discount rate which conducive to banking. The results of this study also suggest that Central Bank of Indonesia and Financial Services Authority of Indonesia are cautious of declining credit growth in recent years. Variable solutions to increase credit growth are encouraged deposit growth, increase GDP growth and lower Central Bank of Indonesia rate (BI rate).

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