

Analysis of Supply Chain Management Practices on Private Banks in Indonesia

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Abstract— This study examines the role of profitability in mediating the effects of supply chain on market structure, GDP growth, inflation rates and exchange rates. This research was conducted at Bank Indonesia of all banking companies namely the National Non-Foreign Exchange Private Bank in Indonesia. Based on a purposive sampling technique, the number of samples (n) from data *time series* every year during the 2013-2017 period is 15 company samples, so the total sample of research for 5 years is 75 observations. The analysis used in this study is *Path analysis* or path analysis. Based on the analysis, overall credit risk at Non-Foreign Exchange Commercial Banks during the 2013-2017 period was influenced by internal factors (capital and liquidity ratios) and external factors (GDP growth) with Profitability as Moderating that occurred between the ratio of capital, liquidity and GDP growth to risk credit. Supply chain strategy has a significant positive effect on profitability at Non-Foreign Exchange Commercial Banks during the 2013-2017 period. Bank size has a significant positive effect on profitability in Non-Foreign Exchange Commercial Banks during the 2013-2017 period. Liquidity has a significant positive effect on profitability at Non-Foreign Exchange Commercial Banks during the 2013-2017 period. GDP growth has a significant positive effect on profitability at non-foreign exchange commercial banks during the 2013-2017 period. Inflation has no significant positive effect with profitability at Non-Foreign Exchange Commercial Banks during the 2013-2017 period. The exchange rate (exchange rate) has a significant positive effect on profitability at non-foreign exchange commercial banks during the 2013-2017 period. Supply chain strategy has a significant positive effect on credit risk at Non-Foreign Exchange Commercial Banks during the 2013-2017 period. GDP growth has a significant positive effect on credit risk at non-foreign exchange commercial banks during the 2013-2017 period. Inflation has no significant positive effect on credit risk at Non-Foreign Exchange Commercial Banks during the 2013-2017 period. The exchange rate (Exchange) has no significant positive effect on credit risk at Non-Foreign Exchange Commercial Banks during the 2013-2017 period. Profitability does not have a significant positive effect on credit risk at Non-Foreign Exchange Commercial Banks during the

2013-2017 period. Profitability only mediates the relationship between the ratio of capital, liquidity and GDP growth to credit risk. The management must establish metrics in supply chain and show a clear link on all performance indicators.

Keywords— Supply Chain Management, Profitability, Credit Risk.

1. Introduction

The present study aims to examine the idea of supply chain management in the financial institutions like banks in the region of Indonesia. After the detailed examination of existing literature current research work has developed a model for the supply chain in financial perspective with its physical implication as well. The banking position as a mediator between parties that have *surpluses* and *financial deficits* has placed banks as the institutions most vulnerable to risks, especially risks related to money [1]. One banking product that has a high risk is credit (financing) products, thus credit risk is one of the main threats faced by financial institutions and is very important for models of *financial distress financial* institutions [2].

Economic theory reveals that commercial banks act as lenders. Joseph *et al.*, support the argument firmly stating that the traditional role of commercial banks is lending credit or loans. In this case, loans constitute the largest share of banking assets where interest is generated, which contributes greatly to the interest income of commercial banks. The nature of loan business is risky because commercial banks expose themselves to the risk of default by borrowers. This is commonly known as credit risk because it is stated as the ratio of problem loans to total gross loans [3].

Bad loans are loans that are ninety days or more past due or no longer generate interest [3]. Badar and Javid stated that loans are considered bad if they fail to pay or are closed to default, so it can be concluded that if the principal and interest

payments are late up to 90 days, it can be considered bad credit (non-performing loans). The level of non-performing loans is called *Non-Performing Loans*, this is a phenomenon that often occurs in the banking world because one of the main activities of banking comes from lending. If non-performing loans are high, it will become a serious problem that will disrupt bank profitability which results in the cessation of bank operations [4].

In [5], stated that bad loans occur because the NPL serves as a guide on asset quality, credit risk, and efficiency in allocating resources to the productive sector. Therefore, the relationship between NPLs and macroeconomics can be explained on the basis that the quality of the loan portfolio (which is the ratio of bad loans to total gross loans) is influenced by systemic risk resulting from exposure to macroeconomic and cross-bank risk factors. The increase in the ratio of non-performing loans to total gross loans shows a bad situation in the results of the banking sector, indicating problems for bank management and also regulators. Conversely, a decline in the ratio of problem loans shows a low level of NPLs, implying a healthy financial system [5].

Credit risk is one of the main risks that greatly influences bank stability. Credit risk in banks is generally defined as the probability of the borrower to repay the loan. The main purpose of banks in channeling funds back to the public (*lending*) is to manage credit risk effectively, because credit risk is an important component of risk management and is important for the long-term success of each bank [6], problem loans or *non-performing loans* Increased can disrupt bank liquidity and profitability and can disrupt the stability of the banking financial system [7]. *Non-Performing Loans* that are not well managed, it will lead to *banking failures* and financial vulnerability of a country.

Credit management is essential to ensure a healthy financial system and may give a warning (*alarm*) beginning to the regulatory authority of the banking system [8]. *Non-Performing Loans* are one of the causes of economic stagnation problems and if the NPL continues to increase, resources may be limited to unprofitable sectors and thus, hamper economic growth and damage economic efficiency [9]. In [10], suggested that to anticipate the risk of non-performing loans, banks are required to form and set aside funds to cover the risk of losses on

loans given to customers.

This lending activity causes banks to generate profits because there are differences in loan interest rates that are usually higher than the interest rate on savings. Loans greatly affect bank profits, if interest income is high, it is predicted that bank profits will increase. The amount of net interest income to the amount of credit extended (*outstanding credit*) is reflected through *Net Interest Margin*. *Net Interest Margin* illustrates the ability of banks to generate interest on the management of their productive assets. According to [11], *Net Interest Margin* is also one indicator of bank profitability (especially in businesses that generate interest income), thus *Net Interest Margin* is one of the benchmarks of a bank's success in obtaining profits through the interest income that it generates. *Net Interest Margin* is obtained from the difference between interest income (obtained from the interest paid by debtors for bank loans) compared to interest expenses (fees to be paid by banks to funders) divided by the average productive assets used [12].

Net Interest Margin is a very important factor in looking at the efficiency of a bank's performance. If the greater the net interest margin generated, the bank has better performance compared to its competitors, because of the important role of net interest margin (NIM) for the world banking then researchers who are interested in the banking world begin to analyze it deeply.

2. Literature Review

2.1 Capital

Bank capital is a protection against the decline in value of its assets, which pushed the bank becomes insolvent (has liabilities greater than assets, meaning that the bank be liquidated. Research conducted by [13], which stated that the supply chain strategy as measured by *Equity to Asset Ratio* (EA) has a positive and significant effect on NIM *Equity to Asset ratio* is used because this ratio measures how far the decline in assets is able to be covered by capital owned and indicates a comparison between own capital and total assets This positive effect means that a high supply chain strategy reflects the NIM generated will be high because the increase in capital triggers an increase in the average cost of capital, as a balance, the bank will assign more financing to compensate for the costs capital by increasing credit interest rates so

that cannot increase the spread of interest which has an impact on increasing the NIM [14-17].

2.2 Bank Size (*size*)

One important question that has been debated in various literature is whether there is an optimal bank size to maximize bank profitability. There is an argument that the size of a bank that continues to grow is positively related to bank profitability. Large banks tend to have high levels of product diversification compared to small banks. In addition to the potential for higher diversification, economies of scale can also be found in large banks. Because diversification reduces risk and economies of scale lead to increased operational efficiency, there is a positive relationship between bank size and profitability ratio is *Size* obtained from the total assets owned by the bank concerned when compared with the total assets of other banks [18]. This variable describes the assets owned by a bank. The greater the assets or assets owned by a bank, the greater the volume of credit that can be channeled by the bank. The greater the volume of credit provides an opportunity for banks to reduce the rate *spread*, which in turn will reduce the *lending rate* so that banks will be more competitive in providing services to customers who need credit. Low lending rates can spur investment and encourage improvements in the economic sector. A low credit interest rate also facilitates credit payments, thereby reducing credit defaults.

2.3 Supply Chain Practices

The aim of this paper is to use a recently developed framework of supply chain integration to examine the influence of a set of relationships between SCI and internal control on financial performance in the Jordanian banking sector. SCI reflects how much the bank's ability to pay withdrawals by depositors depends on the loan as a source of liquidity. The higher SCI ratio shows the good ability of banks in channeling loans to obtain interest income. Banks must maintain the SCI ratio well. The economies of scale perspective, the greater the credit distribution, there are *benefits* efficiency arising related to the *cost* per unit for the management and distribution of the loan portfolio, in other words the higher the ratio of loans provided, the higher interest income will be obtained so that it will increase the NIM [19].

This SCI states how far a bank's ability to repay

withdrawals by borrowers by relying on loans is provided as a source of liquidity. The higher this ratio the lower the bank's liquidity capability. A usage of SCI ratio shows that a bank lends all of its funds (*loan-up*) or illiquid reactive (*illiquid*). Conversely, a low SCI ratio shows a liquid bank with excess capacity of funds that are ready to lend. The greater the funds provided for credit, the bank has the potential to increase the ratio of *Non-Performing Loans*.

SCI is a ratio to measure the composition of the amount of credit given compared to third party funds. This ratio measures the liquidity of a bank. Where the higher the SCI, the more illiquid the bank is because almost all of the funds held are used for credit or financing. So, the higher the SCI ratio, then the possibility of non-performing loans will also be higher.

2.4 Market Structure (*market share*)

Market structure is a variable used to see how much the market share of deposits that have been controlled by banks in a country. Research conducted by [20], which states that market structure has a positive and significant effect on bank net interest margins. The positive relationship between market structure and net interest margins can be explained because the increase in deposits is no longer caused by the interest rates offered to depositors. But because there is a good reputation for the bank that causes increased public loyalty to save despite the fact that the bank pays interest on deposits that are lower than those of rival banks. A good reputation can be seen from the quality of information and technology that is smooth and good service to the financial needs of customers. This opinion is in accordance with findings made by [16], which state that market structure has a positive and significant effect on *net interest margin* [20]. In [21], stated that the market structure had no effect on *net interest margin* (NIM). Bank external factors originate from the market structure as measured by market share and market concentration.

2.5 GDP (*growth growth*)

GDP this reflects the output capacity that can be produced by the economy by utilizing all available resources in the economy .In relation to non-performing loans, in a recession where a decline in sales and income of individuals or companies, it

will affect the ability of individuals and companies to repay loans. Causing increasing non-performing loans. Research conducted by [22], where there is a positive and significant influence on NIM. This was explained by [22], that the development of good economic activity as expressed by positive GDP growth, high demand for credit (due to the nature of the business cycle) and the less problem loans, the higher bank margins will impact on increasing them NIM.

Gross Domestic Product (GDP) or commonly referred to as *Gross Domestic Product* (GDP) is an indicator that measures the output value of goods and services produced by a country, without considering the origin (*nationality*) of the company producing the goods or services. Increased economic growth shows an increase in output as explained in the theory of economic growth. Where the intended output can mean an increase in productivity of producer business activities. When sales of producers increase, it will increase the profit it receives. So that both producers as debtors or people who work as debtors can return or repay loans in accordance with their agreements with banks so that the risk of non-performing loans or financing becomes low.

2.6 Level of Inflation

Inflation is a continuous increase in prices or a situation characterized by a continuous increase in prices of goods. Research on the effect of inflation on NIM conducted by Ugur and Hakan, Dumitic and Tomislav, Raharjo *et al.*, and Plakalovic and Alihodzic, found that inflation has a positive influence significant to NIM [22-25]. This positive effect means that the increase in inflation has an effect on increasing the NIM. This is because the inflation rate has been well anticipated by the banks so that banks can make adjustments in interest rates precisely in order to generate profits from the difference in bank interest. Increased bank interest spreads will impact on increasing NIMs.

Inflation is an increase in the price level that occurs continuously, affecting individuals, entrepreneurs, and government. When there is a *cost push inflation*, the cost of raw materials usually rises so that production costs go up and are followed by an increase in the price of goods sold by producers. Because of this increase in selling prices, people limit their consumption so that producer sales will decline followed by declining profits, so producers as debtors will have difficulty in returning credit,

so the risk of non-performing loans will increase. While in terms of demand pull inflation, inflation occurs due to high demand while the availability of goods is limited so that prices will rise. With a steady income, price increases will increasingly burden people's lives so that the ability to repay loans or financing will decrease and cause high credit risk or problem financing. As a result of research from Greenidge and Grosvenor which concluded that the higher the inflation rate, the higher the NPL level will be. In theory, high inflation will cause a decrease in real income of the community so that people's living standards also fall [26].

2.7 Exchange Rates (Exchange Rates)

The exchange rates of foreign currencies become one of the profitability factors of banks because in their activities, banks provide foreign exchange trading services. Under normal circumstances, trading foreign exchange is basically very profitable because the transaction produces profits in the form of foreign exchange differences. This happens because foreign exchange traders always offer two exchange rates. In these transactions, the exchange rate for foreign currencies is of concern to the bank because it is able to influence the level of profitability of the bank. With fluctuations in foreign exchange rates, banks can obtain income in the form of fees and foreign exchange differences. This opinion is consistent with the findings shown by research Festic and Beco which prove that the nominal exchange rate has a positive effect on the NIM ratio [27].

If the exchange rate (exchange rate) has a negative and significant effect on NIM. The increase in the exchange rate of the rupiah against the US dollar has an impact on the lower NIM ratio. This means that when the exchange rate volatility rises, there will also be an increase in losses and this situation causes the net interest margin to decrease. The fluctuation in the exchange rate of the rupiah causes companies or production households that get their raw materials from abroad to experience additional costs to buy. This is because the cost of raw materials is increasingly expensive and reduces company or household profits and increases the risk of returning financing to banks. Due to the income received by companies and production households is getting smaller or can even experience a deficit due to the price of raw materials that are increasingly expensive and

unable to anticipate. It can be concluded that increasing the exchange rate / rupiah exchange rate against foreign currencies will increase the NPL ratio [28].

2.8 Profitability (NIM)

Net Interest margin (NIM) is a ratio used to measure the ability of bank management to manage its productive assets in generating net interest income. Net interest income is derived from the difference between interest income and interest expense. This ratio describes the level of the amount of net interest income obtained by using productive assets in the form of loans owned by banks. The greater the NIM ratio shows the large difference between the loan interest charged to the customer and the savings / deposit interest earned by the customer, so the possibility of bad loans increases. As stated by Shingjergji that NIM has a positive effect on NPL [29].

The higher the NIM shows the more effective the bank is in the placement of productive assets in the form of credit, conversely when the NIM shows a minimal percentage, there will be a tendency for the emergence of bad credit in this case will increase the NPL ratio. The greater this ratio increases interest income on earning assets managed by banks so that the possibility of a bank in problematic conditions is smaller. *Net interest margin* has a negative relationship with credit risk. This opinion is consistent with the findings of research conducted by [30]. When *net interest margin* a bank's decreases, the bank will make changes to its credit policy, and this will increase the existing credit risk. This was reiterated by [31], a decrease in net interest margins could encourage banks to adopt risky policies. This means that decreasing margins cause banks to change their credit policies, because higher credit risk will

reduce interest margins. While high net interest income can increase margins that contribute to strengthening the bank's capital base in absorbing existing credit risk. The development of intermediation theory states that there is a concept of developing a delegation function into a debt concept, where there will be interest as one of its elements. When the interest income that is earned is too small, then this can reflect that the collection of debt will be given to the borrower. And this also illustrates the increased risk.

Net Interest Margin (NIM) indicates the amount of the difference in the net interest rate obtained by a bank for its activities *intermediary*. Banks with smaller NIM values compared to other banks in one industry are indicated as banks that are less efficient in optimizing the value of NIMs. However, if a bank has a NIM value greater than the NIM value in the average banking industry, it also indicates that the bank is making too much profit from its activities as a financial intermediary. In addition, banks are also required to be able to adapt to changes in interest rates. If banks increase their lending rates too quickly, it tends to make it difficult for borrowers to meet the short-term obligations that must be fulfilled, so that the higher NIM ratio as a result of the implementation of monetary policy (changes in interest rates) will have an impact on increasing NPLs.

2.9 Credit Risk

Indicators of non-performing loans in banks can be seen from the *Non Performing Loan (NPL)* ratio, which is the ratio used to measure the level of non-performing loans faced by banks, the higher this ratio, indicating that credit quality is increasingly unhealthy [32]. Credit risk is the possibility that the borrower will fail to make the required principal and interest payments on the loan.

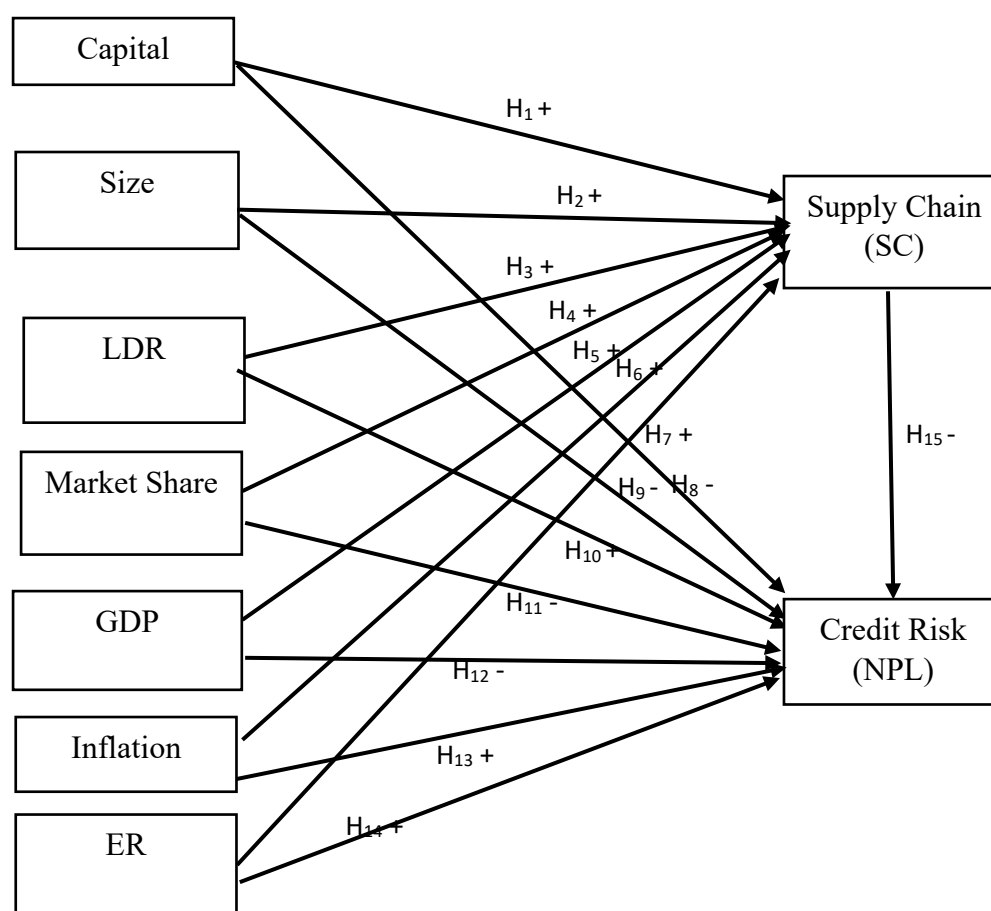


Figure 1 structure of the work

2.10 Conceptual Framework

H₁: Capital has a positive and significant effect on NIM

H₂: Bank *size* has a positive and significant effect on NIM

H₃: SCI positive and significant impact on the NIM

H₄: The structure of the market (*market share*) positive and significant impact on the NIM

H₅: Growth in GDP *is* (growth) positive and significant impact on the NIM

H₆: Inflation Rate positive and significant impact on the NIM

H₇: Exchange rate (exchange rate) has positive and significant effect on NIM

H₈: Capital has negative and significant effect on credit risk (NPL)

H₉: Bank *Size* significant negative effect on the NPL

H₁₀: SCI positive and significant impact on the NPL

H₁₁: The structure of the market (*market share*) a significant negative effect on the NPL

H₁₂: growth in GDP *is* (growth) a significant negative

effect on NPL

H₁₃: Inflation rate has a positive and significant effect on NPL

H₁₄: The exchange rate (Exchange) positive effect on NPLs

H₁₅: Profitability (NIM) negatively affect the NPL

H_{16a}: Profitability (NIM) was able to mediate the influence of Supply chain strategy on Credit Risk

H_{16b}: Profitability (NIM) was able to mediate the effect size of the Bank's RiskCredit

H_{16c}: Profitability (NIM) is able to mediate the influence of the *Loan to deposit ratio* on Credit Risk

H_{16d}: Profitability (NIM) is able to mediate the effect of Market Structure on Credit Risk.

H_{16e}: Profitability (NIM) is able to mediate the effect of GDP Growth on Credit Risk

H_{16f}: Profitability (NIM) is able to mediate the influence of Inflation on Credit Risk

H_{16g}: Profitability (NIM) is able to mediate the effect of Exchange Rates on Credit Risk

3. Methods

With the increasing competition in the global market, it is found that there is very limited product lifecycle for the business firms and more attention is required on supply chain management SCM as well [1-3]. The idea of SCM is known as the set of activities and related approaches which integrates the various suppliers, manufacturers, warehouses and other activities for the timely delivery of products and services [1]. For the better business outcomes, it is very much necessary for all the patterns to involve in SCM to provide a better work output which can timely cover the order and its fulfilment [4]. Numerous theories have argued that effective SCM contributes to the better business outcomes including the financial sector as well [5, 6]. The speed of uncertainty and immediate change in the overall environment of the financial market has made it very much significant to focus on the idea of SCM and related practices. Those banking firms which have to learn how to integrate their core activities with better SCM practices will have a competitive advantage in the market. In existing studies, various factors have been discussed which are playing their role. These factors are entitled as the supply chain integration or SCI as explained by [8], collaboration within and outside the organization [9],[10], [11] sharing of information between the parties and key stakeholders and finally the visibility of the information as well [33-36]. The overall process for the physical and financial supply chain can be expressed with the figure 1 below.

For the present study analysis, following key research questions have been developed and addressed

RQ1: what is the major role of financial institutions like banks for the integration of the financial supply chain for better performance?

RQ2: what is the role of financial institutions like banks for the integration of supply chain

coordination, collaboration, information visibility and it's sharing for the better performance

RQ3: Up to how many levels the employees in the banking firms are aware of the better integration of SCM and related activities. study was designed using quantitative research methods. This research was conducted at Bank Indonesia on all banking companies namely the National Non-Foreign Exchange Private Commercial Bank in Indonesia registered at Bank Indonesia by looking at the financial statements issued to the public. This research period starts from 2013 to 2017. This research was conducted by collecting secondary data from financial reports (*annual report*) on banking companies registered with Bank Indonesia in 2013-2017, data obtained from Bank Indonesia through www.bi.go.id and the Central Bureau of Statistics through www.bps.go.id. The sampling technique used in this study was *purposive sampling method*. *Purposive sampling* is: The technique of determining the sample with certain considerations / criteria.

The purpose of this method is to obtain a sample of certain considerations with predetermined criteria with the intention of obtaining a representative sample. The sample in this study uses *purposive sampling*, because the information needed can be obtained from one particular group that is able to provide information and meet the research criteria. Sample selection criteria to be examined are as follows:

- Banking companies that publish financial statements and financial statement data are available as a whole published for five consecutive years in the period 2013-2017 submitted to Bank Indonesia.
- Financial statements must have a financial year ending December 31 and there are financial ratios that support research.
- Having an NIM ratio of more than 2% to 6% and having an NPL ratio of less than 5%. (Bank Indonesia Provisions)

Table 1. Determination of Research Samples Research Sample

| Criteria | Number of Companies |
|---|---------------------|
| Number of banking companies registered at Bank Indonesia (Non-Foreign National Private Commercial Banks) in 2013-2017 | 47 |
| Data on financial statements is incomplete during 2013-2017 | (20) |
| Does not include complete financial ratios | (12) |
| Number of company samples | 15 |
| years of observation | 5 |
| Number of samples of total observations during the research period | 75 |

Based on purposive sampling techniques, the number of samples (n) obtained from data *time series* every year during the 2013-2017 period is 15 company sample, the total research sample for 5 years is 75 observations.

The analysis used in this study is *Path analysis* or path analysis which is an extension of multiple linear regression analysis is the use of regression analysis to estimate the relationship between the variables (casual models) that were predetermined before the theory. Path analysis is used to test the effect of intervening variables, namely variables between independent variables and dependent variables.

4. Results and Discussion

4.1 Hypothesis Testing

Hypothesis test results are based on analysis of the path is divided into two coefficients of the model lines, coefficient path model I and model coefficients Path II which can be explained as follows:

a. Coefficient Model Path I

The results of analysis of output as follows:

Table 2. Output of Multiple Linear Regression Analysis Model I

| Coefficients | | | | | | |
|----------------------------|------------|-----------------------------|------------|---------------------------|---|------------|
| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | -7.494 | .780 | | 1 | (Constant) |
| | Size | .082 | .015 | .133 | | Size |
| | CAR | .049 | .007 | .332 | | CAR |
| | SCI | .035 | .005 | .412 | | SCI |
| | GDP | .650 | .129 | .101 | | GDP |
| | IHK | .006 | .013 | .011 | | IHK |
| | ER | .000 | .000 | .095 | | Kurs |
| a. Dependent Variable: NIM | | | | | | |

Source: processed data, 2019

Table 3. The model results summary for the model I

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | F | Sig |
|---|-------------------|----------|-------------------|----------------------------|------|-------------------|
| 1 | .996 ^A | .991 | .14515 | 1338,862 | .000 | .992 ^b |
| a. Predictors: (Constant), ER, CPI, SCI, size, CAR, GDP | | | | | | |
| b. Dependent Variable: NIM | | | | | | |

Source: Processed data results, 2019: Appendix 5

Based on table 5.5 it can be seen that the significance value for the four variables is successively for company size (size) of 0,000, supply chain strategy (CAR) of 0,000, liquidity and GDP of 0,000, and an exchange rate of 0,000 which is smaller than 0.05, while an inflation value (CPI) of 0.627 is greater than 0.05. These results prove that company size, supply chain strategy, liquidity, GDP and exchange rates have a significant effect on profitability. Meanwhile, based on table 5.6 magnitude R_{value}^2 was 0.992 suggesting that the contributions or donations effect of firm size, supply chain strategy's, liquidity, GDP and the

exchange rate on the profitability amounted to 99.2% while the remaining 0.8% sebsar is the contribution of other variables not included in this study. While the value of prob. F (Statistic) of 0,000 is smaller than the 0.05 significance level so that it can be concluded that the estimated regression model is feasible to use to explain the effect of company size, supply chain strategy's, liquidity, GDP and exchange rates on the dependent variable Profitability.

b. Coefficient Model Line II

From the analysis results obtained as follows:

Table 4. Output of Multiple Linear Regression Analysis II

| Coefficients | | | | | | |
|----------------------------|------------|-----------------------------|------------|---------------------------|--------|------|
| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | -14.443 | 3.690 | | -3.914 | .000 |
| | size | -.107 | .057 | -.137 | -1.892 | .063 |
| | CAR | .100 | .028 | .529 | 3.522 | .001 |
| | NIM | -.378 | .374 | -.297 | -1.013 | .315 |
| | SCI | .056 | .020 | .516 | 2.728 | .008 |
| | GDP | 2.135 | .467 | .260 | 4.574 | .000 |
| | IHK | .037 | .041 | .047 | .899 | .372 |
| | ER | .000 | .000 | .096 | 1.529 | .131 |
| a. Dependent Variable: NPL | | | | | | |

Source: Results of processed data, 2019: Appendix 5

Table 5. Model summary results for model II

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | F | Sig |
|--|-------------------|----------|-------------------|----------------------------|---------|-------------------|
| 1 | .975 ^a | .952 | .947 | .947 | 188.034 | .000 ^b |
| a. Predictors: (Constant), ER, IHK, SCI, NIM, size, CAR, GDP | | | | | | |
| b. Dependent Variable: NPL | | | | | | |

Source: Processed data results, 2019

Based on Table 5.7 it can be seen that the significance values for the three variables are successive for a supply chain strategy of 0.001, liquidity of 0.008, GDP of 0,000 less than 0.05, while the size of the measure banks are 0.063, profitability is 0.315, CPI is 0.372 and the exchange rate is 0.131, greater than 0.05. These results prove that the capital, liquidity, and GDP ratio significantly influence Credit Risk. While the value of R^2 is 0.952 this suggests that contributions or donations influence supply chain strategy's, liquidity and value of the GDP amounted to 95.2% while the remaining 4.8% is contributed sebsar other variables not included in this study. While the value of prob. F (Statistic) of 0,000 is smaller than the 0.05 significance level so that it can be concluded that the estimated regression model is feasible to use to explain the effect of capital, liquidity, and GDP ratios on credit risk dependent

variables.

While the profitability variable test as a mediating variable between supply chain strategy, bank size, liquidity, GDP growth, inflation and the exchange rate against credit risk can be explained based on the coefficient of model 2 it is known that the equation that can be formed is as follows:

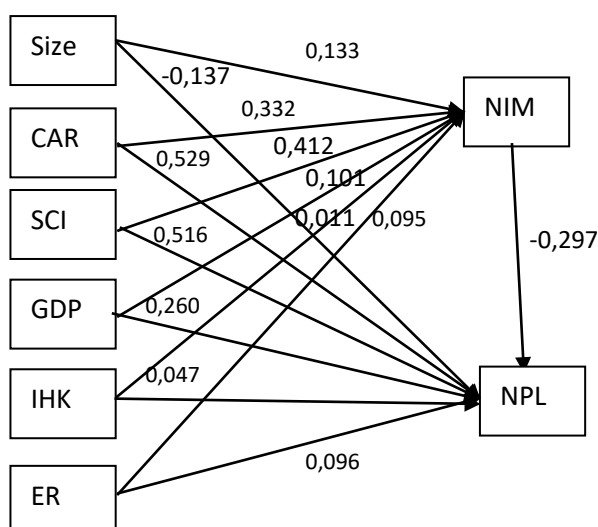


Figure 2. Research Pathway Model

Source: Processed data results, 2019

Based on Figure 5.3, it can be determined the effect of profitability in mediating the relationship between bank size, supply chain strategy's,

liquidity, GDP growth, inflation and exchange rates on credit risk using the Sobel test based on the t value with the results as in table 5.8 below:

Table 6. Variable test results Mediation

| ta (critical ratio var x into M) | tb (var critical ratio x to Y) | Sobel test results | Description |
|----------------------------------|--------------------------------|--------------------|---------------|
| 5.320 | -1.892 | 1.78262318 | not mediate |
| 7.037 | 3.522 | 3.14954572 | mediating |
| 6.848 | 2.728 | 2.53431117 | mediating |
| 5.029 | 4.574 | 3.38375511 | mediating |
| .488 | .899 | 0.42888619 | Not mediating |
| 4.094 | 1.529 | 1.43236494 | Not mediating |

Source: Results of processed data, 2019

Based on the Sobel test requirements for the mediation model, a variable is stated to mediate if the Sobel test value obtained is > 1.96. From table 5.8 it can be stated that Profitability (NIM) only mediates the relationship between the ratio of capital, liquidity (*loan to deposit ratio*), GDP growth, to credit risk (*Non-performing loans*).

From the overall results of the Hypothesis test described, a summary is presented. test results for all hypotheses in this study. The purpose of this presentation is to make it easier to provide conclusions on the results of this study. Next, a summary of the test results for all hypotheses in this study is presented in Table 5.9 as follows:

Table 7. Summary of Hypothesis Testing

| Hypothesis | Results of Research |
|--|--|
| Research Model 1: Effect of supply chain strategy's, bank size, liquidity (<i>loan to deposit ratio</i>), GDP growth, inflation and the exchange rate (exchange rate) to Profitability | |
| Research hypothesis | |
| hypothesis 1 the relationship between the ratio of capital to Profitability | Statement hypothesis: supply chain strategy of positive significant effect with Profitability Result: Accepted |
| hypothesis 2 the relationship between the size of the | Statement hypothesis: the size of the bank Significantly positive effect on |

| | |
|--|---|
| bank with Profitability | Profitability Research Results: Received |
| Hypothesis 3 The relationship between liquidity (<i>loan to deposit ratio</i>) with Profitability | Hypothesis Statement: liquidity (<i>loan to deposit ratio</i>) has a significant positive effect on profitability. Results: Accepted |
| Hypothesis 4 The relationship between GDP growth and profitability | Statement Hypothesis: GDP growth has a significant positive effect on profitability. Research Results: Accepted |
| Hypothesis 5 Relationship between <i>Inflation</i> and Profitability | Hypothesis Statement: <i>Inflation</i> has a significant positive effect on profitability Research Results: rejected |
| Hypothesis 6 is Hypothesis 6 Relationship between exchange rates (exchange rates) with Profitability | Statement Hypothesis: exchange rate (exchange rate) has a significant effect on profitability. Research Results: Accepted |
| Research Model 2: Effect of supply chain strategy's, bank size, liquidity (<i>loan to deposit ratio</i>), GDP growth, inflation and exchange rates (exchange rates) on credit risk (<i>Non-performing loans</i>) | |
| Hypothesis 7 Relationship between the ratio of capital to risk credit (<i>Non-performing loan</i>) | Hypothesis Statement: supply chain strategy has a significant effect on credit risk (<i>Non-performing loan</i>). Research Results: Accepted |
| Hypothesis 8 Relationship between bank size and credit risk (<i>Non-performing loan</i>) | Hypothesis Statement: bank size has a significant effect on credit risk (<i>Non-performing loan</i>). Research Results: Rejected |
| Hypothesis 9 The relationship between liquidity (<i>loan to deposit ratio</i>) and credit risk (<i>Non-performing loan</i>) | Hypothesis Statement: liquidity (<i>loan to deposit ratio</i>) has a significant effect on credit risk (<i>Non-performing loan</i>). Research Results: Accepted |
| Hypothesis 10 Relationship between GDP growth and credit risk (<i>Non-performing loan</i>) | Hypothesis Statement: GDP growth has a significant effect on credit risk (<i>Non-performing loan</i>). Research Results: Accepted |
| Hypothesis 11 Relationship between <i>Inflation</i> and credit risk (<i>Non-performing loan</i>) | Hypothesis Statement: <i>Inflation</i> has a significant effect on credit risk (<i>Non-performing loan</i>) Research Result: Rejected |
| Hypothesis 12 Relationship between exchange rates (exchange rates) and credit risk (<i>Non-performing loan</i>) | Hypothesis Statement: exchange rate (exchange rate) significantly influences credit risk (<i>Non-performing loan</i>) Research Results: Rejected |
| Hypothesis 13 Relationship between Profitability and credit risk (<i>Non-performing loan</i>) | Hypothesis Statement: Profitability has a significant effect on risk credit (<i>Non-performing loan</i>). Research Results: Rejected |
| Research Model 3: Effect of Profitability (NIM) in mediating the relationship between supply chain strategy's, bank size, liquidity (<i>loan to deposit ratio</i>), GDP growth, inflation and exchange rates (exchange rates) on credit risk (<i>Non-performing loans</i>) | |
| Hypothesis 14 Profitability (NIM) as a mediating variable | Hypothesis Statement: Profitability (NIM) mediates the relationship between supply chain strategy, liquidity (<i>loan to deposit ratio</i>), GDP growth to credit risk (<i>Non-performing loan</i>) Research Results: Accepted |

5. Discussion

This study aims to know the effect of variables *profitability* in mediating the effect of bank size, supply chain strategy's, liquidity (*loan to deposit ratio*), GDP growth, inflation and exchange rates (exchange rates) on credit risk (*Non-performing loans*). Discussion of the test results, namely:

5.1 The effect of the ratio of capital to profitability

This study found that capital risk has a significant positive effect on profitability at non-foreign exchange commercial banks, this means that a high supply chain strategy reflects the resulting profitability will be high because the increase in capital triggers an average increase capital costs, as a counterweight, the bank will set a greater financing to compensate for the cost of capital by increasing credit interest rates so as to increase *the spread* interest which results in increased profitability. Because as is well known, bank capital is a protection against impairment in value of its assets, which encourages banks to become insolvent (having obligations greater than their assets, meaning banks can be liquidated). This supply chain strategy is used because it measures how far the decline in assets is able to be covered by the owned capital and indicates the ratio between own capital and the amount of assets. The results of this study are consistent with research conducted by [13-17] which states that supply chain strategy's have a positive and significant influence towards profitability.

5.2 Effect of Bank Size on Profitability

This study found that capital risk has a significant positive effect on profitability (NIM) in Non-Foreign Exchange Commercial Banks, this means that the size of a bank that continues to grow is positively related to bank profitability. Large banks tend to have high levels of product diversification compared to small banks. In addition to the potential for higher diversification, economies of scale can also be found in large banks. Because diversification reduces risk and economies of scale lead to increased operational efficiency, there is a positive relationship between bank size and profitability. The results of this study are consistent with research conducted by [5], the size of the company is a large or small state of the company

that can be known through the amount of equity, sales value and / or total asset value. In [25], found a positive and significant effect between size and NIM. The positive influence can be explained by [25] that an increase in bank assets in the form of credit or other assets will increase credit risk so that the bank will increase the interest spread which will increase the NIM to compensate for credit risk.

5.3 Effect of Liquidity on Profitability

This study found that liquidity has a significant positive effect on profitability at non-foreign exchange commercial banks, this means that the higher liquidity shows the ability of banks to channel loans to obtain interest income. Banks must maintain liquidity ratios well. The economies of scale perspective, the greater the credit distribution, there are efficiency benefits arising related to the cost per unit for the management and distribution of credit portfolios, in other words the higher the ratio of loans granted, the higher interest income will be obtained so that it will increase profitability. In addition, it is known that liquidity reflects how much the bank's ability to pay withdrawals of funds by depositors depends on the loan as a source of liquidity. The results of this study are consistent with research conducted by El-Maudy showing the results that liquidity has a positive effect on profitability, the

5.4 Effect of GDP growth on profitability

This study found that GDP growth had a significant positive effect on profitability at non-foreign exchange commercial banks, this means that the development of good economic activity that can be identified through positive GDP growth, triggering high demand for credit and the lack of non-performing loans, the higher bank margins so that the impact on increasing the NIM. The results of this study are consistent with research conducted by [22] and concluding that there is a significant positive effect on profitability.

5.5 Influence of Inflation on Profitability

This study found that inflation has a significant positive effect on profitability at non-foreign exchange commercial banks, which means that an increase in inflation has an effect on increasing profitability. This is because the inflation rate has been well anticipated by the banks so that banks can make adjustments in interest rates precisely in

order to generate profits from the difference in bank interest. Increased spreads of bank interest will impact on increasing profitability. The results of this study are not consistent with research conducted by [22-25], found that inflation has a significant positive effect on profitability.

5.6 Effect of Exchange Rates on Profitability

This study found that capital risk has a significant positive effect on profitability (NIM) in Non-Foreign Exchange Commercial Banks, this means that the foreign exchange rate is one of the profitability factors of banks because in their activities, banks provide trading services foreign. Under normal circumstances, trading foreign exchange is basically very profitable because the transaction produces profits in the form of foreign exchange differences. This happens because foreign exchange traders always offer two exchange rates. In these transactions, the exchange rate for foreign currencies is of concern to the bank because it is able to influence the level of profitability of the bank. With fluctuations in foreign exchange rates, banks can obtain income in the form of fees and foreign exchange differences. The results of this study are consistent with research conducted by [27] which proves that the nominal exchange rate has a positive effect on profitability ratios.

5.7 Effect of Supply chain strategy to Credit Risk

This research found that capital risk has a significant positive effect on profitability at non-foreign exchange commercial banks, this means that the greater the supply chain strategy of a bank, the smaller the credit risk that will be accepted by the bank. According to Basel II theory, banks must take into account the supply chain strategy in order to manage existing risks. The amount of capital will be used to find out how strong the bank is in dealing with financial difficulties. According to [31], capital with credit risk is closely related, when the borrower fails to repay the loan, the loss will reduce capital from the bank. This result is consistent with the Basel Accord principle for the capital adequacy ratio, which states that banks must maintain strong capital in order to absorb credit risk. As well as in research conducted by [6], it has been explained in his research that capital that has

been capitalized by banks will get lower risk than those that are not capitalized. However, the results of this study are not consistent with research conducted by [31], they explain that capital is negatively related but not significantly with credit risk.

5.8 Effect of Bank Size on Credit Risk

This research found that bank size does not have a significant positive effect on credit risk in Non-Foreign Exchange Commercial Banks, this means that the size of the bank will not affect the credit risk of the bank. While it is known that the greater the size of the bank, the greater the risk of financing faced. The results of this study are not consistent with research conducted by [31], also found a negative relationship between company size and credit risk. They explained that small banks would tend to deal more with risky projects. Likewise, [18], that the greater the size of the bank, the smaller the level of credit risk. The greater the assets or assets owned by a bank, the greater the volume of credit that can be channeled by the bank and the greater the risk borne by the bank.

5.9 Effect of Liquidity on Credit Risk

This research found that liquidity has a significant positive effect on credit risk at non-foreign exchange commercial banks, which means that the higher the value of the liquidity ratio, the higher the value of credit extended by banks. Because as is known, Loan to Deposit Ratio shows the ability of banks in repaying withdrawals of funds made by depositors by relying on credit given as a source of liquidity. *Loan to Deposit Ratio* is the ratio of loans extended by banks to available capital. These results are consistent with the results of research conducted by [30-34], which show that SCI has a positive effect on non-performing loans, as well as Misra and Dhal, find that there is a positive influence of Loans to Deposit Ratio to Non-Performing Loans. However, it is not consistent with previous studies conducted by [35, 36], which stated that SCI has a negative effect on non-performing loans.

5.10 Effect of GDP Growth on Credit Risk

This research found that GDP growth has a significant positive effect on Credit Risk in Non-Foreign Exchange Commercial Banks, this means that the higher the GDP growth, the higher the

credit risk in a company, this is because GDP is used to measure all goods and services produced in a country's economy within a certain period (expressed in money). In the condition of the recession, there is a decrease in GDP where there is a decrease in sales and company income, it will affect the company's ability to repay loans. This can cause increased financing problems. So on the contrary, when a country's economic condition improves economic actors who get loans from banks are in good condition because there is an increase in sales and corporate earnings which generally also increases overall financial stability so as to make debtors have the ability to repay loans provided by banks on time. . The positive impact of financing quality will run smoothly and the possibility of problematic financing which is indicated by non-performing financing (NPF) will be even lower. The results of this study support previous research conducted by [7, 29] shows that GDP growth has a significant effect on problem loans and research by [33-38], which states that GDP growth has a positive effect on problem loans.

5.11 Influence of Inflation on Credit Risk

This research found that inflation does not have a significant positive effect on credit risk at Non-Foreign Exchange Commercial Banks, this means that even if inflation occurs it will not affect credit risk in a company. While it is known that inflation will have a negative impact on the financial condition of companies and individuals. Soaring prices will reduce public purchasing power and the income received from the sale of products and services will decrease further. Capital obtained from financing will experience problems in returning to the bank. This will cause higher NPF levels in banks [28]. The results of this study support previous research conducted by [36], which states that inflation has a positive effect on problem loans [36]. Like the results of research from [26] which concluded that the higher the level of inflation, the higher the level of risk credit.

5.12 Effect of Exchange Rates on Credit Risk

This research found that the exchange rate does not have a significant positive effect on credit risk in Non-Foreign Exchange Commercial Banks, this means that even though the exchange rate has increased or decreased it will not affect credit risk.

Although it is known that the fluctuation of the rupiah exchange rate causes companies or production households that get their production raw materials from abroad will experience additional costs to buy. This is because the cost of raw materials is increasingly expensive and reduces company or household profits and increases the risk of returning financing to banks. Due to the income received by companies and production households is getting smaller or can even experience a deficit due to the price of raw materials that are increasingly expensive and unable to anticipate. It can be concluded that increasing the exchange rate / rupiah exchange rate against foreign currencies will increase the NPF ratio [28]. The results of this study do not support previous studies conducted by [29], shows that the exchange rate has a positive effect on problem loans.

5.13 Effect of Profitability on Credit Risk

This research found that profitability has no significant positive effect on credit risk at non-foreign exchange commercial banks, this means that although profitability has increased or decreased it will not affect credit risk. While the development of intermediation theory states that the concept of developing a delegation function into a debt concept, where there will be interest as one of its elements. When the interest income that is earned is too small, then this can reflect that the collection of debt will be given to the borrower. And this also illustrates the increased risk. These results are consistent with the results of research conducted by Dash and Gosh, they argue that the relationship between profitability and credit risk has a negative but not significant relationship [39]. This was reiterated by [31], a decrease in net interest margins could encourage banks to adopt risky policies. This means that decreasing margins cause banks to change their credit policies, because higher credit risk will reduce interest margins. While high net interest income can increase margins that contribute to strengthening the bank's capital base in absorbing existing credit risk.

5.14 The role of *profitability* in mediating the relationship between supply chain strategies, bank size, liquidity, GDP growth, inflation and the exchange rate against credit risk

Profitability is able to mediate the relationship between the ratio of capital to credit risk. This can happen because the large supply chain strategy will be used to find out how strong the bank is in overcoming if there are problems that financial difficulties have met or are able to overcome the credit risk that occurs. According to [31], capital with credit risk is closely related, when the borrower fails to repay the loan, the loss will reduce capital from the bank. Profitability does not mediate the relationship between Size and credit risk. Whereas [39] found a positive and significant effect between size and profitability. A positive influence can be explained by Raharjo that an increase in bank assets in the form of credit or other assets will increase credit risk so that banks will increase interest spreads which will increase profitability to compensate for credit risk. So that the impact on credit is not quality and increases the value of bank credit risk. Profitability mediates the relationship between liquidity and credit risk. As is known, liquidity reflects how much the ability of banks to pay withdrawals of funds by depositors depends on the loan as a source of liquidity. The higher liquidity ratios indicate the ability of banks to channel loans to obtain interest income. Banks must maintain liquidity ratios well. The effect of liquidity on profitability can be positive.

Profitability mediates the relationship between GDP growth and credit risk. Because Gross Domestic Product (GDP) is the total value of goods, services, economic value added and the amount of economic income in one period. Increased economic growth shows an increase in output as explained in the theory of economic growth. Where the intended output can mean an increase in productivity of producer business activities. When producer sales increase, it will increase profits. So that both producers as debtors or the people who work as debtors can both repay or repay loans in accordance with the agreement at the bank so that the risk of non-performing loans or financing is low. According to [40] economic growth as seen from GDP shows a company's revenue growth. The ability of debtors to repay their debts will also increase so that credit risk

indicated by credit risk will decrease.

Profitability does not mediate the relationship between inflation and credit risk. As is known, inflation is an increase in prices on an ongoing basis or a condition marked by an increase in the price of goods continuously. The level of inflation has been anticipated by the banks so that the bank can make adjustments in interest rates appropriately in order to generate profits from the difference Bank interest. Increased bank interest spreads will have an impact on increasing credit risk. Inflation will affect economic activities both macro and micro including investment activities. Inflation also causes a decrease in people's purchasing power which results in a decrease in sales. Decreased sales that occur can reduce corporate returns. The reduced return that occurs will affect the company's ability to pay credit installments. Increasing installment payments make credit quality worse and even bad loans occur, thereby increasing credit risk. Profitability does not mediate the relationship between the exchange rate and credit risk, because the indirect value is greater.

6. Conclusion

The use of effective supply chain management practices has become a potentially valuable way of securing competitive advantage and improving organizational performance. The objective of this study is to establish the effect of supply chain management practices on performance of Private Indonesian Bank. Based on the description above, it can be concluded that overall credit risk at Non-Foreign Exchange Commercial Banks during the 2013-2017 period was influenced by internal factors (capital and liquidity ratios) and external factors (GDP growth) with Profitability as Moderating that occurred between capital, liquidity and GDP growth to credit risk. This study provides empirical evidence to add to the business research literature in Indonesia specifically about credit risk, precisely expanding research on the influence of internal factors (capital, and liquidity) and external factors (GDP growth) on credit risk by including product ability as a mediator. In addition, there is also the development of an integrated model of the effect of capital, liquidity, GDP growth on credit risk. This research provides empirical evidence about the Financial Intermediation Theory about the effect of capital and bank size on profitability and credit risk, Liquidity Preference Theory and Keynes Theory regarding the effect of liquidity,

GDP growth, inflation and exchange rates on profitability and credit risk. This study also provides an empirical contribution to the theory of Banking Risk Management, namely on the influence of internal factors (capital, liquidity) and external factors (GDP growth) on credit risk.

For banking institutions, the results of this study suggest that banking institutions are better able to improve the performance of the financial accounting system, in order to overcome credit risk, this can be seen from the presence of supply chain practices with profitability as moderating occurs between the ratio of capital, liquidity and GDP growth to credit risk. In addition, the results of this study become a reference in order to improve banking performance because of the evidence obtained, it turns out to provide benefits for banks and banks must overcome credit risk that occurs by considering existing factors. For the government as the party that makes the rules and policies, the suggestion of the results of this study is that economic activities run smoothly and financial transactions can support economic activities well, it is necessary to fix the economic system of banking finance. The government has an important role in making these rules and policies and encourage banking institutions to improve the ability of the banking system and credit. In addition, the government must also encourage business people, especially companies, to use banking services in business activities to achieve higher economic benefits.

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