Bank Financial Capability on MSME Lending Amid Economic Change and the Growth of Fintech Companies in Indonesia

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Abstract

𝕿his paper studies ten years (2008-2018) of annual financial data from four state-owned banks, macroeconomic data and data from the financial technology (Fintech) industry using ratio analysis, dynamic estimation and common size statements analysis. The study also considers the analysis of independent attributes, for example, GDP growth, interest rates and Fintech lending capacity and capability that could affect the financial performance of the banks. Moreover, this research emphasizes that competition with Fintech companies could affect banks' performance and the capacity to supply loans which bring the diminishing of banks' capability to disburse their loans, especially to MSMEs. In general, the results show that most of the banks are still capable of increasing lending capacity to MSMEs as mandated by the regulation in the short term. However, in the long term, the intention is moving slowly and tends to decrease, possibly due to the dynamics of economic growth and the development of financial technology companies. In particular, this study avails the strategy and policy that banks should be taking, for example, determining the risk management on capital invested in the long run amid the uncertainty of the economic situation, as reported previously in the long run as the GDP growth affected the MSME financing. Our research also contributes to the improvements of the banks' credit management, the effectiveness of loan distribution, and explains the repercussion of the Fintech lending on MSME. For instance, as mentioned in the analysis, this study suggests that the observations might have significant implications on further investigation on the prioritization of the strategy that optimally used to solve the issues on the allocation of funds by making collaboration between the bank and Fintech companies. In addition, this study is expected to raise concern about financial inclusiveness amid the development of the digital economy. Overall, this research supplies some insights into the evaluation process of banking sector's financial performance and the impact of macro-economy and digital economy through Fintech on the bank lending services towards MSMEs, including analysis contributing to decision-makers in making correct decisions.

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1. Introduction

This article investigates a financial analysis of government-owned bank disbursements of micro, small, and medium-sized enterprise (MSME)[1] loans in Indonesia. The investigation is limited to four widely-recognized, state-owned banks in Indonesia: Mandiri Bank, BNI (Bank Negara Indonesia), BRI (Bank Rakyat Indonesia), and BTN (Bank Tabungan Negara). The research is important to identify whether state-owned banks, with existing capital, assets, and profitability, are still capable of increasing loan capacity distributed to micro, small, and medium-sized enterprises (MSMEs). Also, this study is dealing with the impact of economic fluctuation and the diminishing of profitability caused by tight competition among financial institutions (Beck, Demirgüç-Kunt, & Maksimovic, 2004). For example, digital lending through financial technology (Fintech).

The economic factors and Fintech lending were chosen as the control variables to add research novelty and fill research gaps. The addition of both intervening variables on bank lending is due to economic uncertainty and the rapid growth of digital financing, especially peer to peer lending companies which could affect the banks' financial performance in distributing the credit on MSMEs. Also, this paper simultaneously investigates the impact of macroeconomic factors and the effect of Fintech companies'[2] coexistence on the banks' performance. And the credit channeling of MSMEs, as most prior research, separately explained either moderating or mediating variables and concomitantly did not have interconnection. In addition, to comprehensively corroborate the evidence, integrated dynamic analysis consisting of the vector error-correction model (VECM), impulse response function, granger causal and panel data survey analysis are used.

Moreover, the study primarily concerns the financial evaluation of the state-owned banks' financial capability and compliance. Due to their role in diffusing at least 20 percent of total banking to MSMEs credit in 2018, as mandated by the regulation No. 14/22/PBI/2012 and was later amended by regulation No. 17/12/PBI/2015 where the quality of credit provided must remain in a *good* category. In this regulation, Bank Indonesia regulates sanctions given if a commercial bank cannot fulfill these obligations. Sanctions imposed include a reduction in current account services for commercial banks. However, if the banks can satisfy the regulation requirements, the central bank will add an incentive through the addition of loans to funding ratio portions and tax discretions. In addition, as stated in Indonesia's financial authority regulation No.6/POJK/3/2016, the bank will be permitted to expand new business and be provided legal permission to open a new branch. To comply with the regulation, Banks should have a financial capability to grow the loan disbursement capacity.

State-owned banks are included in this paper due to the role of public banks as the largest financial institutions supplying credit to micro, small and medium-sized enterprises (MSMEs). Another reason government banks are the objects of this study is due to the salutary effect on public finance and the economy (Cornett, Guo, Khaksari, & Tehranian, 2010; La Porta, Lopez-de-Silanes, & Shleifer, 2002), which pertains to the topic of this research.

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[1] The criteria for a MSMEs is a firm that has net assets value from USD 4 thousand (IDR 50 million) up to USD 750 thousand (IDR 1 billion), or annual sales turnover less than or equal 25 thousand (IDR 300 million) to USD 4 million (IDR 15 billion) regardless of the land and building business premises.

[2] As of 2018, there are approximately 113 financial technology companies in Indonesia that are allowed to diffuse credit to MSMEs. They are registered on the Indonesia financial authority (OJK) lists with more than 4,359,448 borrower accounts and 20 percent of lending growth rates.

All in all, the primary goal of this research is to discuss the financial evaluation of loan disbursements paid out to MSME by state-owned banks in Indonesia. This research focuses on the aspects of capability and compliance by state-owned commercial banks in Indonesia in enhancing credit distribution capacity and explains the long term impact of economic growth and the effect of the development of Fintech companies on bank funding evolvement. Eventually, the hope is for this study to inform bank stakeholders in the formulation of policies and management strategies that can develop bank income and comply with the financial authority regulation.

2. Literature Review and Hypotheses

2.1 Bank Financial Capability of Increasing MSME Lending Capacity

Mercieca, Schaeck, and Wolfe (2009); Mudd (2013) argue that the structure of banks, lending relationships and small firm access to financing analyses can bring financial predicaments that have negative repercussions on credit propagation. Similarly, Schmieder, Marsch, and Forster-van Aerssen (2010) also suggest that a bank's capital structure influences the capability of lending distribution to MSMEs. Aiyar, Calomiris, and Wieladek (2015); Baker and Wurgler (2015); Eldridge, Ryoo, and Wieneke (2015) affirm that the general assumptions indicating bank's decision to control capital expenditure are identified with the formation of debt and equity payments. That shall meet the government regulation dealing with capital adequacy ratio (CAR). If the return on asset (ROA) increases, the bank is in a healthy condition, and it means that the CAR value as a measure of a bank's capital can fulfill operational needs without using debt financing and equity (Batten & Vo, 2019).

In addition, the effect of the MSME's debt on the position of management control can affect the bank's capital structure (Alihodžić & Ekşi, 2018; Carbo-Valverde, Rodriguez-Fernandez, & Udell, 2016; Tracey, 2011). In the meantime, Faulkender and Petersen (2005); King (2009) observed that every source of funds would raise the capital costs, either interest costs for deposits entrusted to the bank or dividends as costs of equity. The greater the funds disbursed by the bank, the higher the debt ratio compared to capital itself (Gambacorta & Mistrulli, 2004; Guinnane & Schneebacher, 2018; Schroeder, 2015).

Berger, Minnis, and Michael (2017) assessed a bank's financial health and examined several aspects of bank lending performance, such as CAMELS factors (Capital, Assets Quality, Management, Earning, Liquidity and Sensitivity). The five aspects of a bank's performance are indeed the determinant factors of bank financial capability of growing lending distribution to private sectors like MSMEs. In this study, the bank lending capability was indicated by the improvement of the proportion of total loan capacity for all sectors divided by the amount of loan distributed to MSMEs. (Ab-Rahim, Kadri, Ee-Ling, & Dee, 2018; Batten & Vo, 2019; Rosengard & Prasetyantoko, 2011; Rostami, 2015)

H1: Capital adequacy ratio positively relates to the bank capability on MSME loan distribution

H2: Return on asset positively relates to the bank capability on MSME loan distribution

H3: Operating expense ratio negatively relates to the bank capability on MSME loan distribution

H4: Loan deposit ratio positively relates to the bank capability on MSME loan distribution

H5: Non-performing loan negatively relates to the bank capability on MSME loan distribution

2.2 Economic Linkage of Bank Financial Performance and Lending on MSME

Martinez, Martina, and Conor (2019); Shaw, Chang, and Chen (2013) suggest that capital adequacy is an important factor to investigate bank performance in accordance with the determinant of bank lending on MSMEs and the economy. Then the relationship between the banking sector and MSMEs has a strategic position in supporting the country's economic system (McGuinness & Hogan, 2016; Padilla-Pérez & Ontañon, 2014). Therefore, the banking sector needs to be maintained to support economic sustainability (Kammas, 2017).

Some research results suggest that the development of the financial system is closely related to the level of investment and economic growth (Wachtel, 2003). Carroll and McCann (2016); Levine (2005) state that another factor determining MSMEs' investment and economic growth levels is the interest rate of bank loans.

Meanwhile, a similar finding was also found by Berrospide and Edge (2019) who argue that a bank's financial ratios (including loan growth, assets, and lending standards) affected lending and macroeconomic variables, such as gross domestic product (GDP) (Foluso & Ikhide, 2019; Levine, 2005).

Several initial works carried out by Adeyefa, Kayode, and Owoputi (2015); Clause (2007) pinpoint one of the signs that economic variables influence bank earnings as being the macroeconomic policies that increase a bank's credit expansion through stable economic growth. Additionally, Beck (2013) shows that MSMEs are typically more financially constrained during crises than other firms due to the restriction of monetary policies.

H6: GDP Growth positively relates to the MSME loan distribution
H7: Interest Rates positively relates to MSME loan distribution

2.3 Competition Between Conventional Banks & Fintech Companies

A preliminary study on the Fintech industry in Indonesia by Davis, Maddock, and Foo (2017) reports that competition in the financial sector has been intensifying since 2016. Many MSMEs with low financial inclusion and lack of collateral attempt to access funding via Fintech and shadow banking to develop their businesses. According to previous research by Chishti (2016), the growth of Fintech companies via peer to peer technology has affected bank crowdfunding in the UK. Meanwhile, an investigation regarding peer to peer process management by Wang, Chen, Zhu, and Song (2015) found that small business users tend to gain finance from online peer to peer lending due to flexibility of investment rates and less credit screening. Another study, developed by Lee and Deng (2018) from a seminal article on the future growth of financial inclusion in Asia which was carried out by Yeow, Chuen, Tan, and Chia (2018) highlights that small businesses benefit from lending technologies because they can reduce loan transactions costs. In contrast, a study by Schweitzer and Barkley (2017) argue that bank debtors are more satisfied with conventional bank services than online financing, since Fintech companies are less adequate in providing quality face-to-face customer service.

In regards to competition between Fintech companies and banks, Claessens, Frost, Turner, and Zhu (2018) confirm that the higher a country's revenue and the less competitive its banking system, the more intensive its Fintech credit activity will be. Additionally, Fintech company credit volumes are also larger in countries with less

stringent banking regulations. In some nations, the activities of Fintech companies shadow banking operations and are assumed to be the main competitors of banks.

H8: Financial technology company lending capacity negatively relates to the MSME loan distribution held by the banks

2.4 Research Framework

The hypotheses are presented in a conceptual model as illustrated by the flow-chart below:

Figure 1: Conceptual Model
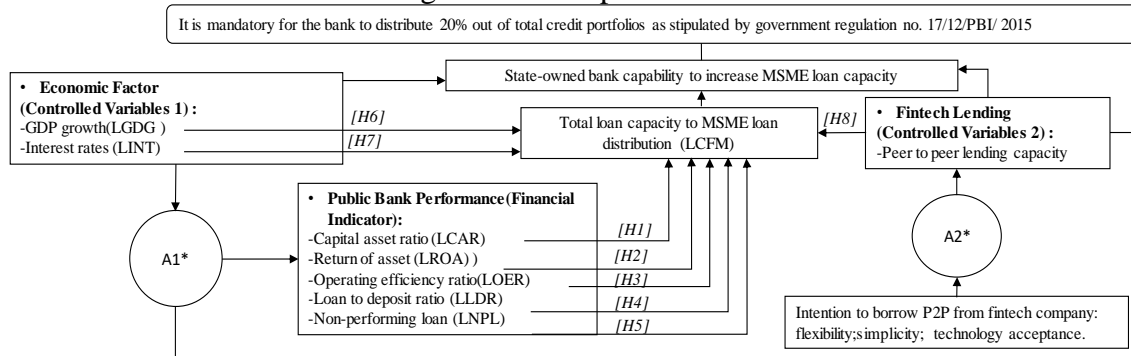
Note: H1,H2,H3,H4,H5,H6,H7,H8: hypotheses of relationship between dependent and independent variables (see also part of literature review);*A1:panel data analysis, A2:cross-section data analysis.
Source: Authors' explanation.

3. Methodology

3.1 Data Collection and Sample

In corroborating the evidence, statistical data were gathered from the secondary data deployment. It consists of monthly data of bank financial performance (measured by capital, assets quality, management, earnings, and liquidity aspects), and macro-economic data of four state-owned banks in Indonesia, which give loans to MSMEs from December 2008 to December 2018 (N=484). The secondary data consist of total loan capacity to MSME financing, capital adequacy ratio (CAR), return on asset (ROA), operating expense ratio (OER), loan to deposit ratio (LDR), non-performing loan (NPL). Those were collected from banks' financial reports, and the data of peer-to-peer Fintech lending were coming from Indonesia financial authority. Data on macroeconomic (GDP and interest rate) were coming from the bank central of Indonesia.

The financial data was collected to understand the banks' financial capabilities and performance. It is essential to comprehend that the internal factors (i.e., bank financial performance) and the external factors (i.e., economic condition and competition with other types of financial institutions) affect banks simultaneously in distributing loans to MSMEs.

Table 1 explains the descriptive statistics of all the panel data set that has been transformed into the log-form. Ultimately, all the variables are stable in terms of the mean, variance, and standard deviation value. It indicates that the variables are elastic and free from heteroscedasticity problems. Overall, Jarque-Berra scores obtained from the kurtosis and skewness value show lower than the Chi-square value (JB<χ^2=535.23, p=0.05). It means that there is no auto-correlation issue, and the model is normally distributed or fit. The details of the descriptive analysis are also presented to support the review of the data set as follows:

Table 1: Descriptive Statistics of Panel Data

Details	LCFM	LCAR	LLDR	LOER	LROA	LNPL	LGDP	LINT	LFIN
N	484	484	484	484	484	484	484	484	484
Range	0.77	0.55	0.30	0.54	0.71	0.83	1.73	0.30	1.88
Minimum	2.87	2.55	4.25	4.19	0.74	6.54	0.50	2.35	0.32
Maximum	3.64	3.10	4.55	4.74	1.44	7.36	2.22	2.65	2.20
Mean	3.30	2.87	4.43	4.37	1.15	7.04	1.44	2.48	1.43
Std. Error	0.02	0.01	0.01	0.01	0.01	0.01	0.03	0.01	0.04
Std. Deviation	0.19	0.14	0.09	0.11	0.14	0.16	0.38	0.07	0.45
Variance	0.04	0.02	0.01	0.01	0.02	0.02	0.14	0.00	0.21
Skewness	-0.03	-0.27	-0.73	0.62	-0.12	-0.29	-0.24	0.62	-0.79
Kurtosis	-0.66	-0.83	-0.61	-0.26	-0.90	0.61	-0.03	0.15	-0.09
Jarque-Berra	2.20	4.94	12.51	8.08	4.39	3.56	1.18	7.82	12.67
Sum	399.68	347.45	535.99	528.62	139.65	851.61	174.72	300.15	172.48

Source: Authors' estimation based on data from Indonesia Financial Authority, 2019.

On the other hand, the author conducted observations and survey to support the evidence. The primary data was taken from questionnaire responses by Indonesia MSME owners (n=335). Out of total amount of 340 questionnaires were distributed, only five were invalid or 335 questionnaires were returned back completely filled and collected. Table 2 illustrates the respondent's profiles with a 95% confidence level and +/-0.053 margin of error for sample proportion.

Table 2: Descriptive Statistics of Survey

Profiles		Frequency	%
Gender	Male	114	34.0
	Female	221	66.0
Company Age	<5 years	302	90.1
	16-10 years	29	8.7
	Above 10 years	4	1.2
Fintech User	Yes	157	46.9
	No	178	53.1
Operating System Platforms	Android	278	83.0
	IOS	24	7.2
	Both	33	9.9
Net Asset (USD) -Micro Enterprise	≤4 thousand	293	87.5
-Small Enterprise	more than 4 thousand - 40 thousand	35	10.4
-Medium Enterprise	more than 40 thousand -750 thousand	7	2.1
Gross Income (USD) -Micro Enterprise	≤ 25 thousand	298	89.0
-Small Enterprise	more than 25 thousand - 200 thousand	23	6.9
-Medium Enterprise	more than 200 thousand - 4 million	14	4.2
Employee	Less than 4	168	50.1
	5 to 19	167	49.9

Note: n=335.
Source: Authors' compilation.

In general, MSME surveys were located in the areas of big cities in Indonesia consist of Jakarta, Bogor, and Bandung. The survey was taken in those areas because the locations can represent the overall regional MSME Indonesia.

After carried out the survey, the data collection activity was proceeded by taking more information to clarify the result study. Additional information on the influence of

bank competition with Fintech companies towards the lending distribution was generated through focus group discussions with microfinance experts at the Indonesian Microfinance Expert Association Forum (www.imfea.or.id) with a listed member of 82 persons. The respondents of the association are coming from various disciplines and job positions, including bankers, MSME trainers, incubators assistance, MSME stakeholder, etc. However, our study only takes n=10 to be included to join a forum group discussion (FGD). The FGD was to confirm the determinant factors of loan distributions to MSMEs that are not covered by the quantitative analysis. For example, to confirm the reasons why MSME looks for alternative funding besides the bank, to clarify the finding gap, and to affirm the data classification and model used in the study, and finally, to comprehend the pitfalls and the positive features of the analysis results.

In this study, FGD is utilized only to find out the aspects that do not cover in the study using quantitative data. In the FGD, the number of participants is an important factor that must be considered. According to some literatures on FGD, the ideal number of participants is 7-11 people (Dawson, Manderson, & Tallo, 1993), but some suggest a smaller number of FGD participants are 6-8 people (Krueger & Casey, 2000). Fewer respondents do not provide interesting variations, and too many will reduce each participant's opportunity to contribute to the in-depth discussion. The number of participants can be reduced or increased depending on the objectives of the study and existing facilities. In the first attempt, 100% percent of participants are invited.

The selection of the degree of homogeneity or heterogeneity of participants must be following the initial purpose of holding the FGD. Consideration is needed to solve the heterogeneity problems involves certain variables that are sought for heterogeneity or homogeneity. The respondents of the survey about the influence of Fintech companies towards the bank capability in distributing the loan are more or less has homogeneity, coming from the finance and bank institution members.

Before conducting the actual FGD, the role play should be done in advance to find out whether the questions are well prepared and well understood by the participants, and in line with the objectives of the research. For instance, the definition of bank performance, such as CAMEL (Capital adequacy, Asset quality, Management capability, Earnings capacity and Liquidity), is explained initially to the respondents to assess the bank's recent condition. Our study omits sensitivity analysis (S) to avoid the bias of the study objective as we do not determine the particular risks exposure affects the institution compared to market risks. On the other hand, the moderator also discussed how the Fintech company is developed in Indonesia and the significant impact of Fintech on the bank loan circulation to MSMEs. Subsequently, the author addressed the respondents to make the first attempt to answer the questions via form before doing the interviews.

In the first attempt, the author included 100% (N=82) of the population of member Indonesia Microfinance Experts. However, after the initial stage had been implemented, there were about 60% (n=50) group of respondents who interested to join the group discussion. Then, in the second stage, the group participants were decreasing to 30%(n=25) due to the different expertise that the respondents might think related to the topic of the research and the ability of respondents to create focus group dynamics. Eventually, we got 12% (n=10) of respondents who have the inherent quality and experiences corresponding with the research topic. The following are our FGD participants as identity encrypted: AS= Director of IMFEA and Former Bank Supervisor, AM= Bank Finance Technology Manager, WD= Fintech Director, EY=Bank Director, AK=Banker, EN=Banker, AB=Banker Manager, EP=Banker, HD=Banker, RA=Indonesia Financial Service Authority Member. The questions of FGD consist of investigating determinant factors influencing the bank capability in

distributing the loan on MSME, and the competition between banks and Fintech companies, and asking the practical recommendations concerning MSME loan distribution.

3.2 Measurements

The author modified several terms and models used in (Beck, 2013) regarding bank financing to MSMEs using panel data. For instance, the variable of bank lending on MSME was adopted from the variable of the share of total loan presented in the previous study. There also several adjustments in variables used. Such as, changing a small, medium, and large-sized (SML) firm categorization become a micro, small, and medium-sized enterprises (MSME). Additionally, we omit the distinction between variables interest rates for the best and the worst enterprise becoming only the interest rates for MSME. Since the MSME has a different standard of interest rates compared to the large company. Also, the author added more variables from the study of Berger and Black (2011); Gunji and Yuan (2010) based on bank size, profitability and liquidity in relation to loan channeling, and they were transformed into CAMEL (Capital identified by CAR, Asset identified by ROA, Management identified by OER, Earning identified by LDR and Liquidity identified by NPL)[3]. And the improvement of total loan capacity to MSME lending distribution reflected the capability of banks to distribute lending to MSME.

Another evaluation of variables used in this study in regards to the determinant factors of macro-economy towards the lending distribution on MSMEs was coming from the papers written by Kelly, McQuinn, and Stuart (2013), in which the GDP variable was used in the study. The author also followed the study by Foluso and Ikhide (2019)investigated the influence of the business cycle towards bank lending to small enterprises. Moreover, we have specified the aspect proposed by Bofondi and Ropele (2011) that consider five categorizations of economic factors. Referring to a general state of the economy, price stability and the outlook of economic growth and translated into the interest rates, GDP growth. Also, we are extracting the variables of loan supply capacity ratio (total loan provision /MSME credit) (LCFM) and interest rate (LINT) from the aggregate model used by Perez (2017). Before then, we did an extraction on a few of independent variables to prevent the collinearity problems. In this case we replaced the equity and rate to return with the return on asset (LROA).

Developed from the evaluation for differences in banks' financing features across small, medium-sized, and large enterprises by Beck et al. (2004), the linear model utilized to analyze the secondary data can be formulated as follows:

$$Yt = \beta 0 + \beta 1 X1_{it} + \beta 2 X2_{it} + \beta 3 X3_{it} + \beta 4 X4_{it} + \beta 5 X5_{it} + \beta 6 X6_t + \beta 7 X7_t + \beta 8 X8_t + \varepsilon \quad (1)$$

where,

Y = State-Owned Bank Lending Distribution Capacity to MSME(in US$) labelled as LCFM

X1: CAR (Capital Adequacy Ratio) (in percentage) labelled as LCAR;

X2: ROA (Return On Asset)(in percentage) labelled as LROA;

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[3] Capital Adequacy Ratio (CAR) value is derived from a comparison between their capital with Risk-Weighted Assets (RWA). If the CAR value of a bank is less than 8percent, it indicates that the bank's financial condition is in an unhealthy condition. RWA is the sum and value of each asset or asset after multiplied by the weight of each risk in the asset; Return on Assets (ROA) ratio obtained by comparing the net profit achieved with the total assets owned by the bank; The capability of bank management to control operational costs against operating income also can be assessed by the operational efficiency ratio (OER);Loan to Deposit Ratio (LDR) measures the availability of funds and sources of bank funds at present and in the future, for instance, third party funds.

X3: OER (Operating Expense Ratio) (in percentage) labelled as LOER;
X4: LDR (Loan to Deposit Ratio) (in percentage) labelled as LLDR;
X5: NPL (Non-Performing Loan)(in percentage) labelled as LNPL;
X6: GDP (Gross Domestic Product Growth Growth) (in percentage) labelled as LGDP;
X7: Interest rates relates to the MSME Loan (in percentage) labelled as LINT.
X8: Financial technology company lending capacity (in percentage) labelled as LFIN.

Where, β = constants; i=observation t = time period; ε = error term.

Subsequently, the vector error correction model (VECM) is also applied to examine the long term effect. The Granger Causality Analysis will be implemented to see the reciprocal effect between the independent and dependent variables.

The panel data model is utilized to determine the influence of each type of credit distribution consisting of working capital, investment, and consumption of four public banks. In advance, the data are estimated using the Hausman test to define the appropriate data that fits in the research on the basis of recent studies dealing with the determinant of commercial banking (Batten & Vo, 2019). Based on Wald criterion Greene (2018), Hausman statistics can be formulated as follows:

$$W = m =[\beta FEM - bREM]\ \psi^{-1}\ [\ \beta - b] - \chi^2[K\text{-}1] \tag{2}$$

Where under the null hypothesis, W has a limiting chi-squared distribution with $[K - 1]$ degrees of freedom, β is a vector for fixed-effect variables, b is a vector of statistics random effect variable, ψ is the covariance matrix for the alleged random-effects model. If the m value of the test results is greater than χ^2, then there is enough evidence to reject the null hypothesis, so the used model is the fixed-effect model. However, if the data is non-stationary, the Vector Error Correction Model can be used to restrict the VAR (Vector-Autoregressive) model. This additional restriction must be given because of the existence of non-stationary forms of data at the level, but co-integrated. Thus, in VECM, there is a speed of adjustment from short term to long term. The specifications of the VECM model, in general, are as follows:

$$\Delta Y_t = A_{0t} + \Gamma_1 \Delta Y_1 t + \Gamma_2 \Delta Y_2 t + \pi Y_{t-p} + e \tag{3}$$

Where Y_t is a vector that contains the variables analyzed in the study, A0 is the vector intercept of π, and Γ are the functions of the coefficient in the equation. Matrix of π can be broken down into two matrices, λ and β, with dimensions (n x n). $\pi=\lambda+\beta\tau$, where the adjustment of matrix λ is a co-integration vector, and τ is the co-integration rank.

Before continuing to estimate the Vector Error Correction Model (VECM), the prior model should follow several basic steps: *firstly*, ensure that all series are already stationary in the first difference (I(1)); *secondly*, the optimal lag length criteria for the model is already defined; *thirdly*, the co-integration test has already been performed including (p)lags; *fourthly*, make sure that there is no co-integration on the unrestricted VAR model; *fifthly*, there is re-specification on the model with lag (p) in the co-integration; lastly, re-perform diagnostic tests on the model analysis (Enders, 2008).

As explained in Table 3, it can be noted that five variables are not stationary after measured by the unit root test. This can be seen from the probability of ADF t-statistic values of those several variables less than P-value, and the ADF statistics are larger than Mac Kinnon Critical Value and statistically significant (p<0.05). The

variable, which is not stationary at the level, comprises LCFM, LCAR, LINT, LLDR, and LROA.

The implementation of non-stationary data will produce spurious regression, which causes inconsistency in the estimation. It has been found that five variables are not stationary and another seven variables that are stationary at the level. Therefore, it is necessary to proceed with the unit root test on the first difference level (Gujarati, 2011).

Table 3: Stationery Test of Vector Auto-Regressive (VAR) Data

Variables	Stationery Level			
	Level		First Difference	
	Prob. t statistics	Remarks	Prob.t statistics	Remarks
DLCFM(-1)	0.340	Non-Stationer	0.000***	Stationer
DLCAR(-1)	0.369	Non-Stationer	0.000***	Stationer
LOER	0.056*	Stationer	0.000***	Stationer
LGDP	0.002***	Stationer	0.000***	Stationer
DLINT(-1)	0.442	Non-Stationer	0.002***	Stationer
DLLDR(-1)	0.538	Non-Stationer	0.000***	Stationer
LNPL	0.004***	Stationer	0.000***	Stationer
LOER	0.042**	Stationer	0.000***	Stationer
DLROA(-1)	0.529	Non-Stationer	0.000***	Stationer
LFIN	0.000***	Stationer	0.000***	Stationer

Note: *p-value < 0.10. **p-value < 0.05, *** p-value < 0.01, The value is standardized coefficient.
Source: Authors' estimation.

The unit root test at the level of first difference is done as a consequence of not convergence with stationary assumptions at the level (zero degrees) (Enders, 2008). Based on Table 3, it can be seen that all data is used in this study, it is stationary at the level of first difference. Henceforth, it can be said that all the data used in this study are integrated into first degree (I (1)).

Table 4 below shows the lag optimum that can be included in data analysis on VAR model. It is obviously apparent that most of the several tests (FPE,AIC,SIC,HQ) is directing to the first lag. Thereby the results of the co-integration test indicating there is a co-integration on the first lag when including the data into the model trace test (probability=0.020, p< 0.05).

Generally, it is postulated that if the panel data is not stationary at the level but becomes stationary at the same level of differentiation, then the data is co-integrated (has a long term relationship). Thus, to some extent, the co-integration test can only be done when the data used in the determination is integrated. The most widely used co-integration test option is the co-integration test developed by Johansen (Stewart, 2018; Sul, 2019). To explain the presence or absence of co-integration by investigating at the maximum likelihood estimator, using the likelihood ratio (LR) test. If the calculated value LR is greater than the critical value of LR, than we can accept the co-integration of a number of variables and vice-versa. Then, if the calculated value of LR (Trace Statistics) is smaller than the critical value, thus, there is no unit root (Brooks, 2019; Gujarati, 2011; Hill, Griffiths, & Lim, 2018).

Table 4: Lag Optimum Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	957.8997	NA	3.40e-21	-15.91428	-15.65739	-15.80996
1	1937.407	1761.466	1.85e-27*	-30.34297*	-27.26024*	-29.09117*
2	2052.044	184.9619*	2.16e-27	-30.23604	-24.32748	-27.83676

Note:*p-value < 0.05
Source: Authors' estimation.

Moreover, we used several variables developed from peer to peer (P2P) process analysis Wang et al. (2015) and technology acceptance model (TAM) theory Davis (1993) to identify the MSMEs willingness to opt for the lending systems. The five points of Likert scale (1: strongly disagree to 5: strongly agree) were applied to understand the response of financial technology acceptance, which comprises flexibility, simplicity, and acceptance (see table 9 and 10). The questionnaire and the results of the survey could be retrieved in table 5. In accordance with research ethics and privacy, respondents ask to keep company names confidentially and only provide initials.

After utilizing EFA (Exploratory Factor Analysis) to establish underlying dimensions between estimated variables and latent constructs, the results (as illustrated in table 5) show that all variables in the aspects of MSMEs response towards Fintech are valid (χ^2=1558.308,p<0.05) and reliable (Cronbach's α=0.827, k=11,n=335).

Table 5: Validity and Reliability

KMO and Bartlett's Test			
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.			0.900
Bartlett's Test of Sphericity	Approx. Chi-Square		1558.308*
	df		335
	Sig.		0.000
Vailidity Statistics			
	1	2	3
VAR00001	.151	.433	.238
VAR00002	.218	.587	-.579
VAR00003	.154	.724	-.071
VAR00004	.759	-.059	-.043
VAR00005	.794	-.057	-.106
VAR00006	.299	.364	.734
VAR00007	.717	-.092	-.072
VAR00008	.822	-.169	-.051
VAR00009	.831	-.029	.083
VAR00010	.840	-.015	.022
VAR00011	.889	-.093	.006
Reliability Statistics			
Cronbach's Alpha			N of Items
.827			11

Note:*p-value < 0.05
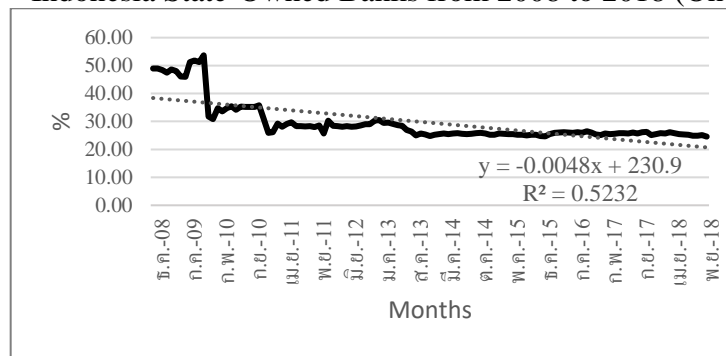Source: Authors' estimation.

3.3 Data Analysis

The analysis of this study is using both quantitative and qualitative methods (mixed-method). The data assessment was processed in three types of analyses. *Firstly*, the long term and the short term (dynamic) statistical analysis using Vector Error Correction Model (VECM) regression is utilized to analyze time-series data collected

from the secondary data. *Secondly*, it is continued with descriptive analysis and simple regression to analyze the primary data of the survey on MSME's owner response to Fintech lending. *Lastly*, the study has proceeded with the qualitative analysis of forum group discussion

         As shown in the line diagram in figure 2, the trend of credit portions of loan capacity to MSME lending provided by the public banks on average is above 20 percent in ten years. Meaning that the public banks comply with the government's credit policy and still have the capability to increase loan capacity to MSMEs. Nevertheless, the amount of credit to MSMEs tends to leveling-off in recent years and is likely to gradually fall-off in the long term. Thus, this trend needs to be evaluated with further analysis to understand whether the bank still capable of significantly distributing the loan to MSMEs in the long term.

Figure 2: Trend Analysis of MSME Lending Distribution Capacity of
Indonesia State-Owned Banks from 2008 to 2018 (On Average)

Source: Author's computation from time-series data of MSME finance statistics, 2019.

         If a glance at the trend analysis of the time series data, it can be seen that the banks have fulfilled the prerequisites for channeling funds to MSMEs by around 20 percent in 2018, but the amount continues to decline over time unless the quality of credit assets are well maintained considerably. Using a different method of analysis, the previous study about MSME financing by Nisa (2016) shows similar findings with these results. This is also consistent with what was conveyed in the annual report of state banks (OJK, 2019) in a study by Claessens et al. (2018) and an interview with credit practitioners. It was identified that the slowing down of credit distribution, one of them is caused by the increasing competition between banks and the development of companies engaged in financial technology, which affects *fee-based income* from credit. In terms of microcredit, regardless of small-medium sized firms, only BRI Bank (70.42%) meets the 20 percent threshold of lending compared to the other three banks. However, there is visible movement from Mandiri Bank (15.44%), BNI Bank (14.04%), and BTN Bank (0.10%) to expand in the development of microcredit.

4. Results

         Based on the Hausman test on the panel data of observed banks in table 6, it was found that the Chi-Square probability value is greater than 0.05 (χ^2=0.00,p=1.00), which means that the model fail to reject a null hypothesis, where H0: random effect, or better using random-effect model estimator than the fixed-effect model.

Table 6: Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.000000001	3	1.000

Note:* Correlated Random Effects-Hausman Test; Pool: PANEL; Test cross-section random effects.
Source: Authors' estimation.

Therefore, the following estimation should be carried on by using a random effect model (error component model) evaluator, for instance, by conducting the vector error correction model (VECM).

Table 7: Results of Panel Analysis of Bank Financial Capability + Factors (VECM)

Long term Analysis				Short term Analysis			
Variables	Coefficients	t-statistics	Prob	Variables	Coefficients	t-statistics	Prob
LCAR(-1)	0.375	2.753***	0.007	CointEq1	-0.222	-1.857	0.066
LLDR(-1)	1.184	4.498***	0.000	D(LCFM(-1))	0.109	0.838	0.404
LNPL(-1)	0.016	0.197	0.844	D(LCAR(-1))	0.139	0.791	0.431
LOER(-1)	-0.263	-2.286**	0.024	D(LLDR(-1))	0.673	2.108**	0.037
LROA(-1)	0.434	4.579***	0.000	D(LNPL(-1))	-0.167	-1.594	0.114
				D(LOER(-1))	-0.003	-0.019	0.985
				D(LROA(-1))	0.020	0.144	0.886
Factor1:				Factor1:			
LINT(-1)	-0.020	-0.069	0.945	D(LINT(-1))	-0.348	-1.222	0.224
LGDP(-1)	0.124	4.948***	0.000	D(LGDP(-1))	-0.027	-0.952	0.343
Factor 2:				Factor 2:			
LFIN(-1)	-0.062	-2.623**	0.010	D(FIN(-1))	-0.083	-0.226	0.366
C	-6.783			C	-0.003		

Note: *p-value < 0.10. **p-value < 0.05, *** p-value < 0.01
Source: Authors' estimation.

After adding some controlled variables as shown in table 7, the result of the Vector Error Correction Model (VECM) is highlighted as follows:

$$ECT_{t-1} = [1.000LCFM_{it-1} + 0.375CAR_{it-1} + 1.184LLDR_{it-1} + 0.016LNPL_{it-1} - 0.263LOER_{it-1} + 0.434LROA_{it-1} - 0.020LINT_{t-1} - 0.124LGDG_{t-1} - 0.062LFIN_{t-1} - 6.783$$

(5)

$$\Delta LCFM_{t-1} = -0.222ECT_{it-1} + 0.109\Delta LCFM_{it-1} + 0.139\Delta LCAR_{it-1} + 0.673\Delta LLDR_{it-1} - 0.167\Delta LNPL_{it-1} - 0.003\Delta LOER_{it-1} + 0.020\Delta LROA_{it-1} - 0.348\Delta LINT_{t-1} + 0.027\Delta LGDP_{t-1} - 0.083\Delta LFIN_{t-1} + ECT_{t-1} - 0.003$$

(6)

Note: ECT:error correction term/ the co-integration relation; LCFM: MSME loan; LCAR: Capital adequacy ratio; LNPL: Non performing loan; LROA: Return on asset; LOER: Operating Expense Ratio; LLDR: Loan to deposit ratio; LINT: Interest rate; LGDP: Gross domestic product growth; LFIN: Fintech lending capacity i:Observation; t:Time; u: Error Term.

Hypothesis 1

Based on the test results, the capital adequacy ratio (LCAR) is positively related to MSME credit, and significant in the long run ($\Gamma t-1=0.375, p=0.007$), although it has a positive value but not significant in the short run ($\Gamma t-1=0.139, p=0.431$). This means that in the short term, the increase in the LCAR ratio does not affect MSME capability lending, even if the relationship is one-way. It is possible because the management policies of the state-owned banks are no longer focused on maintaining or increasing their capital above the LCAR. The situation is implied from the average LCAR of state-owned banks still being high above the minimum limit of 8 percent set by the central bank of Indonesia (BI), which ranges between 15-20 percent. Thus, state-owned banks are no longer increasing the withholding of funds to meet LCAR needs and limit

lending. This factor is plausibly responsible for the stabilization of the banking industry to circulate their credit to MSMEs.

Hypothesis 2

In the essence of bank financial performance, the public bank demonstrates satisfactory performance compared to previous years, where the bottom line of existing core competence shows significant improvement. It can be identified from the compound moving average of the return on asset (LROA) over several years. In the long run, LROA positively and significantly contributes to MSME credit (Γ_{t-1}=0.434,p=0.000). This shows that banks with a high rate of return on assets tend obtaining higher profits so that they have a greater ability to increase MSME credit because banks are in the position to have a relatively good level of performance.

Hypothesis 3

As a result of banks upholding the capital structure, sufficient liquidity and risk management, the finding of this study also confirms that the banks' business processes are going well. This is explained by the growth of Operating Expense Ratios from 78.64 percent in 2017 to 77.86 percent in 2018 (OJK, 2019), which indicates the ratio between operational costs and operational revenue. The results of the estimated Operating Expense Ratio (LOER) of the state-owned bank group in table 7, LOER has a negative relationship with MSME credit. The lower the LOER, the efficient the bank is operated. The findings on table 7 fail to reject the hypothesis and show the value of LOER is negative but insignificant (Γ_{t-1}=-0.003, p=0.985) in the short run. In the long term, the value is negative and significant (Γ_{t-1}=-0.263, p=0.024). That means the bank is efficient in managing its operations in the short run and in the long run. It implies that an efficiency program via cost retention management can control the growth of operational costs, so that the lending distribution to MSMEs can be implemented successfully, and do not exceed planned budget allocations. Since banks have targeted to enhance the growth of MSME credit distributions, the supply of lending for MSMEs is imposed at 64.11 percent from third party fund allocations (Indonesia, 2018). In the long run, the capability of the banks in developing lending distribution capacity is quite robust because of the efficiency that banks did.

Hypothesis 4

From the VECM estimation results in table 7, only the loan deposit ratio (LLDR) variable is significant in the short term while the other variables are not (Γ_{t-1}=0.673, p=0.037). This happens simply because a variable reacting to another variable requires lag and in general, the reaction or effect of one variable on another will take place in the long run. Afterward, the growth of third-party funding increases with the increase of loan distribution to MSMEs. In terms of channeling funds owned by banks, the increase in the minimum statutory reserves associated with achieving a credit-to-funds ratio (LLDR) encourages banks to increase their credit expansion. This emerges in the distribution of funds to MSMEs.

Bank financial health will affect credit distribution indirectly through the loan deposit ratio (LLDR). In connection with the loan deposit ratio (LLDR), the vector error correction model (VECM) shows that LDR has a positive and significant effect on credit disbursement (Γ_{t-1}=1.184, p=0.000). If we dig down inside the impulse response function (see figure 1), LLDR that reflects third party fund distributions has a compound average growth rate of 5-10 percent and tends to remain constant for some time at 2-3 time lags, although the third party fund allocation value is increasing. The amount of MSME loan provisions depends on the credit capacity available at the bank.

Nonetheless, this happens because the increasing credit capacity is not fully channeled to the sector, especially for MSMEs. The portion of bank lending to this sector is still relatively low, even though there is an increase every year.

Hypothesis 5

Moreover, the bank undertook risk by channeling credit in the long term. This most likely occurs because the bank group has adequate funds to provide credit. So that despite having a high LNPL ratio, banks continue to expand loan distributions with the consideration that banks do not bear high-interest costs for funds raised, especially third-party funds with expensive fees such as deposits and foreign exchange.

Table 8: Granger Causality Estimation Result

Variables	Chi-sq	Prob.
D(LCAR)	1.934736	0.3801
D(LLDR)	0.651088	0.7221
D(LNPL)	9.762109***	0.0076
D(LOER)	0.677140	0.7128
D(LROA)	1.111339	0.5737
D(LINT)	2.081752	0.3531
D(LGDP)	1.208092	0.5466
D(LFIN)	1.030010	0.5975

Note: *p-value < 0.10. **p-value < 0.05, *** p-value < 0.01
Source: Authors' estimation.

Meanwhile, the LNPL ratio is positively related to MSME credit in the long term but negatively related in the short term. Further, evidence from the analysis revokes the hypothesis and reveals bias when comparing short term and long term effects. In the prior stage of the test, the result shows that non-performing loans have a positive effect and are not significant (Γ_{t-1}=0.016, p>0.05) if using the VECM model tests. After it is compared to the dynamic panel data (βit=-3.041, p<0.05), and granger causality test (χ^2=9.762, p=0.0076). Then, we found that the analysis convincingly shows negative value and significance (see Table 8).
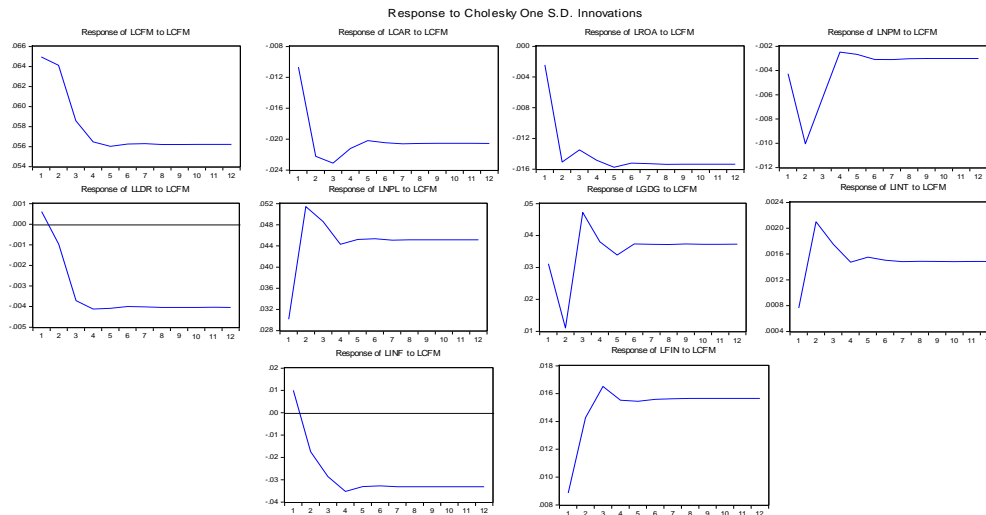
Hypothesis 6

In terms of the impact of economic growth, the result shows that in the short term, as revealed by the VECM analyses, gross domestic growth (LGDP) does not always influence bank loan channeling to MSMEs. However, in the long term, the growth of the economy plays a vital role in contributing to the distribution of loans to MSMEs. The value of the LGDP coefficient is 0.124, where t statistic of 4.948 is greater than 1.96 with p-value is lower than 0.05 (prob.=0.000, p<0.01) (see table 7), so this means that variable change in economic growth in the long run is significant and has a positive impact on credit circulation.

These results also offer corroborative evidence of economic changes and the effect on the movement of MSME bank lending transmission recovery in the long term. It has occurred when the VECM analysis demonstrates the p-value lower than 0.05 (prob.=0.000, p<0.01) and the impulse response function (IRF) in figure 3 reveals the

sign of stabilization after the shock[4]. Thus, it can be concluded that the variable volatility in economic growth (LGDP) on the time of observation is significant and affects the MSME lending distribution as a dependent variable. Then, it continues to constant after the first semester. If the lag of the model is added, so the apparent influence of economic fluctuation is less than six months.

Figure 3: Impulse Response Function Estimations

Source: Authors' estimation.

Hypothesis 7

As presented by VECM analyses (table 7), the credit interest rate (LINT) affects negatively on the loan to MSMEs (LCFM) in the long period (Γ_{t-1}=-0.020, p=0.945). In this paper, the current case of interest repercussions towards MSME loans shows that the interest rate apparently remains constant and slightly lower than previous periods. These results are supported by Afanasieff, Lhacer, and Nakane (2002); (Eggertsson, Juelsrud, Summers, & Wold, 2017) who comments that it is common for business sectors, including MSME, to expedite investment by looking for more financing from banks when credit interest rates are falling. However, if we look at the VECM estimation, although the influences have no significant effect, it can be highlighted that interest rates have a negative repercussion on the MSME loan disbursement both in the long run and short run. This because the interest rates charged to MSME debtors are soft and there are subsidies for MSMEs. Thus, the growth of interest rates does not have a significant effect on the lending supply of MSMEs.

Hypothesis 8

The wide-spread financial technology companies offering peer to peer (P2P) lending affects bank credit capacity exposed by the amount of credit distributed by the public banks and absorbed by MSMEs (see figure 2). In the long term, the distribution of credit by Fintech companies (LFIN) has a negative effect and is significant (Γ_{t-1}=-0.062,p=0.010) and affect the dependent variable (LCMF). In particular, we adapted the model suggested by Wang et al. (2015); Davis (1993) to understand the willingness of MSME owners to finance their businesses with peer to peer lending. Additionally, we

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[4] The sign of impulse response function (IRF) responses on the tested variable of bank loan distribution to MSMEs (LCFM) elucidates the impact of controlled variables still viable at the beginning of the periods. The shocks are gradually subsided and stabilized after a semester.

found the reasons from our survey that for small business owners to obtain funding from digital loans include their perception of flexibility and simplicity in transactions and administering the credit. Table 9 shows that the value of simplicity (β=0.335, p=0.001) and flexibility (β=0.436, p=0.001) are significant and positively related to the intention to be financed *by* Fintech.

Table 9: MSMEs Perception of Financial Technology Company Financing

R Square	Adjusted R Square	Std. Error	Durbin-Watson	F	Sig.
0.967	0.961	0.54091	1.242	107.602*	0.000
a.Dependent Variable: MSME financed by Fintech Company	Variables	Coefficients	Std. Error	T	Sig.
	(Constant)	0.434	0.63	0.689	0.492
b. Predictors: (Constant), flexibility, technology acceptance, simplicity	Flexibility	0.436	0.127	3.444***	0.001
	Simplicity	0.335	0.095	3.546***	0.001
	Technology Acceptance	0.171	0.137	1.249	0.213

Note: *p-value < 0.10. **p-value < 0.05, *** p-value < 0.01
Source: Authors' estimation.

Alternatively, taken from the survey analysis, as presented in table 10 below. Even though the role of the Fintech company still could not outweigh the function of the bank as the primary lenders, it seems that the MSME respondents were also interested in Fintech lending instead of obtaining a loan from the bank.

Table 10: Survey Results

Indicator (%)	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Flexibility					
It is so flexible for MSME when to get on with Fintech than the bank (in terms of time and distance)	-	29.85	24.77	42.09	3.28
It is easy to access the funding to Fintech company	4.18	29.25	11.94	49.25	5.37
Fintech helps the financial inclusiveness towards the MSME rather than the bank did.	4.78	20.60	22.39	42.09	10.15
Borrowers initiate the lending procedure	1.79	7.46	41.19	42.99	6.57
Borrowers indicate the amount they want to borrow and the maximum rate they are willing to offer	2.69	8.66	36.12	39.40	13.13
Simplicity					
Fintech is less credit screening compared to the Bank	1.19	2.99	15.22	74.33	6.27
The financing process is quick compared to the Bank	2.39	11.34	17.61	51.04	17.61
The financing process is easy compared to the Bank	2.39	14.33	19.10	43.28	20.90
No administration fee when processing the loan from Fintech	3.58	11.64	37.31	33.13	14.33
Acceptance					
Interested in Fintech due to the features	2.69	9.25	25.67	38.51	23.88
Expect to get funding from Fintech company	0.30	28.06	24.78	42.39	4.48

Note: n=335
Source: Authors' survey.

4.1 Forum Group Discussion Results

Examining the relevant answer from forum group discussion (FGD) text, we found that:" the economic factors are more influenced compared to the effect of Fintech development in the long run" (HD,WD,EP,AS, AK). This comment supports our regression result mentioning that GDP growth affect positively and significantly towards banks' profitability reflected by the positive value of ROA in the long term. There also some factors are affecting the dire growth of lending supply to MSME, not only relates to Fintech growth but also refers to MSME, such as "competition within the

financial institution, interest rates, non-performing loan, capital structures, management, etc" (RA,HD,AS,AK). In addition, if we take a look at the demand side, there is the possibility of the MSME debtor to find the finance from the alternative funding system, like "using financial technology (AS,AM,WD). Moreover, the public bank most likely to shift the strategy from conventional to digital banking to overcome credit distribution issues." (AS,RA,AM,EP,EY,AK,EN,AB,WD,HD).

Another answer to be put in the suggestion is that: "public banks shall improve reasonable risk management by profiling risk-based control and performing early warning systems through the *risk-based* approach, which constitutes strategic credit management, risk capital management, and profitability control via advanced *on-line* lending technology. These studies also propose public banks perform cash management systems containing financing solutions to *non-corporate* customers such as MSMEs. Indeed, cash management is necessary to customize the system and tighten up the bank system and lending products that are needed by the MSME" (RA,WD,AS). The public banks are also suggested to:" alleviate the cost of funds, manage the credit portfolio composition to have an optional yield and raise operational effectiveness and maintenance of cash flow stability to respond to MSME credit demand changes" (AS,AM,EY,EN,HD). In regards to the bank's financial capability related to bank lending, it appears that banks still have a decent performance in increasing funding capacity and distributing the loan to MSME, although the lower interest rates and plan for six-months payment rescheduling are applied in 2020(OJK, 2019).

What public bank should do in the short run is:" to apply not only the worst-case scenario to overcome the credit default, but also undertake strategic scenario, for example alleviating the cost of fund, managing the credit portfolio composition in order to have an optional yield and to raise up the operational effectiveness and maintenance the cash-flow stability to response the changes of MSME credit demand "(AM,EP,EY,AK,EN).

The public bank needs to be more proactive in taking long term strategic decision-making. such as: "to perform cash management services to facilitate the MSME in a business transaction supported by advanced digital technology such as online networking and wider digital services coverage as needed accordingly by MSME customer base" (WD, AS, RA,HD).

As a consequence of business changes due to the tight competition with Fintech company, the public bank should:" commit to improve on-line technology to adapt to the immediate business climate changes through the advance methods of credit scoring, the usage of business analytics technology in evaluating the credit, and the ability to build a long term connection with the MSME borrower supported by the high tech financial mobile intelligence system. This technology means to monitor the lending distribution digitally and collaborate with the Fintech to cater to the services that fit with the MSME business preference and enhance bank's lending capability to improve MSME loan capacity" (EY, AM, AS, EN,WD).

4.2 Summary of Empirical Findings

In the short run, the relationship between LCAR, LROA and LCFM (proportion of total credit provision capacity /loan to MSME) positive and LOER is negative, but overall are insignificant. The VECM regression results find that there is a significant positive statistical relationship between LLDR and MSME lending capacity. It means that overall banks have the excellent performance to support their capability to increase the MSME lending in the short term without affected by the external factor, such as economic growth (the LGDP value shows negative and insignificant) and the competition with the Fintech lending. Nonetheless, this capability should be tested to

comprehend the state-owned banks' resistance in facing the competition and to know the impact of external influences on the bank's resilience in diffusing the MSME loan in the long term.

Moreover, in the long run, our examination on determinant factors of bank lending distribution, including the economic factors and the growth of Fintech company found that economic factors more influence and significant to the bank funding to MSME compared to a Fintech company in different ways. The bank performance (showing by the significant positive relationship of LCAR, LROA, LLDR, LLOER) and its capability somehow affected significantly by the economic situation and the growth of Fintech in the long run. This means that when economic growth is positive, it makes the bank performance is going better and strengthen the bank lending capability. They may increase the lending supply to propagate MSME loans. However, the capacity of bank lending disbursement on MSMEs is diminishing gradually as economic growth tends to be considerably declining over time. On the other hand, bank sustainability in the lending capability of supplying loans to MSMEs also threatened by the development of Fintech lending in the long run.

To date, MSME lending is important to be concerned due to the role of MSMEs as one of the driving forces of economic growth and sustainability, exports, and as a source of innovation (Beck, 2013). Indonesian financial authorities also fully support the MSMEs by issuing Government Regulation Number 23 of 2018 concerning 0.5% tax tariffs reduction for the MSME and also plan to give a stimulus to lengthen credit repayment for MSME under the decree: No. SP 60 / DKSN / OJK / 7/2015 and entails the banks to distribute at least 20% of their credit provision to MSMEs.

As shown in the VECM regression, the growth *of* Fintech companies brought a significant impact on the MSME lending capacity of state-owned banks in the long run. Without alliances with the Fintech company, it will decline the banks' performance when the profitability of Fintech company raises their profitability through business expansion.

5. Discussion, Conclusions and Policy Recommendations

5.1 Discussion and Conclusions

The VECM regression implies that gross domestic growth (economic growth) is influential on bank lending to MSMEs in the long term, but not in the short term. However, the interest rate does not affect the short term and long term.

Also, one of the factors diminishing bank lending distribution on MSME is caused by increasing competition between banks and the development of companies engaged in financial technology that affects *fee-based* income from non-interest credit. In the long term, it will dwindle the amount of loan channeling toward MSMEs by Banks.

In the short term credit default perspective, it shows that non-performing loans are still tolerable to the bank lending distribution, albeit, in the long run, the NPL negatively impacts the credit disbursement. Thus, we conclude that there is a distinction by the banks in perceiving the short term default and the long term default. In addition, the role of banking financial performance in MSME lending is directly affected by NPLs; if the NPL is high, the bank income from credit decreases. Thus, this will affect both the banks' financial health and bank lending in the long term and short term. The impulse response function (figure 3) explained that there are different effects between each factor in the banks' financial performance subject to credit disbursement. Given that bank, capital has increased, the speed of bank cash-flow is also growing, but the time of credit repayment is overdue.

Additionally, comparing Indonesia and Thailand with regards to bank lending distribution to MSME versus Fintech lending, the situation is quite different, although they have a similar pattern of responses. For instance, Thailand's average economic growth rate in 2018 was around 3.7% (yoy) less than Indonesia at about 5.0%(yoy), due to the high numbers of working group population (PwC, 2019). In terms of Fintech growth (Thailand estimated at around 12%%; Indonesia at 2.4%) and MSME's bank lending disbursement (Thailand at about 54.0%; Indonesia at 13.0% from total MSME), Thailand was around 82.2% and Indonesia at 63.4% of the population), and Thailand financial inclusion is higher than in Indonesia (Thailand at 78%; Indonesia at 17% from total MSMEs) (Bank, 2019; EYGM, 2019).

Lesson learned from this study is that Thailand should develop and retain the quality of banks and Fintech lending and build the capacity of the MSME funding institution. For example, by improving the bank lending system using more advanced technology (i.e.5G tech) and controlling shadow banking and illegal/ unlicensed Fintech company. Besides, suggest the financial institutions to collaborate and avail more financial inclusion and credit facility to the MSMEs which have excellent performance. In order to create a healthy financial institution environment, provide a resilient and sustainable economy through the development of MSME.

5.2 Policy Recommendations

The result of the empirical results of the study shows that other aspects of external variables, such as economic growth also influence the provision of MSME loans. Therefore, we expect the government to be able to control low and stable bank's loan to deposit ratio (LDR) so that it can encourage the availability of bank credit allocations, especially to MSMEs. Moreover, there should be a government policy to increase gross domestic product (GDP) by improving the stability and improve MSMEs' ease of doing business by, to some degree, reducing tax and credit guarantees. Besides, the government is expected to be able to determine the target of economic growth, which could support the banks' lending development and distribute the state budget to develop MSMEs' performance through subsidies in the form of loans grant with soft interest.

Furthermore, as the state-owned banks' NPL value is quite stable at this time, and it could make bank operational can support the country's economy. Therefore, the government must stimulate the bank by giving more incentives to the banks who achieve the target of lending distribution on MSME and able to maintain their lending performance. For instance, tax relaxation and interest rates reduction instead of adjusting the statutory reserve requirement and giving incentives in the form of lending to funding ratios (LFR) for the banks that have lower non- performing loans (NPL). This way is necessary to attract banks to give more loans to MSMEs.

Besides that, referring to regression using the vector error correction model (VECM), there is a significant impact of Fintech in the long run. It will affect bank profitability in the future and considerably lessen the bank role as the formal lender of the resort. To some extent, it drives the MSMEs that unreachable by the banks will look for other alternative financing institutions, for example, a shadow banking. To avoid the increasing of shadow banking through the illegal Fintech company, we do hope that the government via Indonesia's financial service authority (OJK) encourages the state-owned banks to improve the lending technology system or incorporate with the Fintech company. Therefore, the government must impose the rules that can enhance collaboration between banks and Fintech so that healthy competition occurs between banks and Fintech companies in terms of lending distribution to MSMEs. Moreover, the financial authorities need to provide relaxation to a bank that willing to develop

financial digitalization and shorten the waiting time to get a permit for Fintech development and collaboration. The finding is convergence with the study of Fermay, Santosa, Kertopati, and Eprianto (2018), letting the bank freely to launch various kinds of products without limited with permission.

In addition, the survey on this study explained that MSME owners attracted to borrow from the Fintech company instead of the bank. Thus, in that sense, Bank Central Indonesia as representative of the government's financial authority, is expected to conduct monitoring and assessment of every business activity involving Fintech and its payment system of MSME lending using technology. Bank Indonesia, as a regulator board, also should maintain relations with relevant authorities to continue to support the existence of Fintech payment systems in Indonesia and commit to supporting MSMEs in Indonesia by providing regular guidance on Fintech.

Furthermore, the government must issue the policy to give more incentive towards the banks, which can achieve the target of lending distribution on MSME and able to maintain their lending performance. For instance, it can be done by facilitating the banks that have a lower non-performing loan (NPL) through tax and interest rates reduction. Besides, adjusting the statutory reserve requirement and giving incentives in the form of lending to funding ratios (LFR) of the bank.

To strengthen bank lending capability on MSME lending distribution via a credit management system, we identified from forum group discussion that the public banks should improve reasonable risk management. By profiling risk-based control and performing early warning systems through the *risk-based* approach which constitutes strategic credit management, risk capital management, and profitability control via advanced *on-line* lending technology. At the same time, the observations might have important implications on the strategic prioritization that optimally used to solve the issues on the allocation of third-party funds. And to increase financial inclusiveness amid the development of the digital economy.

The public banks are also suggested to alleviate the cost of funds, manage the credit portfolio composition in order to have an optional yield and raise operational effectiveness and maintenance of cash flow stability to respond to MSME credit demand changes.

Other factors that should be resolved for future studies are the compliance and contingency issues that must be pointed out by public banks when channeling credit towards MSMEs as imposed by the regulator and monetary authority. Including the amount of total credit to be distributed to MSMEs and the establishment of digital public bank holding services.

The investigation on the MSME lending analysis is yet to completely define the real situation of bank credit disbursement to MSMEs, especially regarding demand and the way that MSMEs respond to the credit absorptions offered by banks. On the other hand, the findings might not be representative to particularly explain all the components of the financial capability of the public banks in channeling credit to MSMEs. However, this study tries to provide more in-depth insight for bank stakeholders when making decisions to improve credit quality and provides direction to banking boards of management to develop more compatible technology to benefit from intense competition in bank lending. In particular, for the researcher, the significance of this research is to enhance knowledge about micro-financing and Fintech, and enrich the understanding of bank capability in financing MSMEs.

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