Uncertain Supply Chain Management 12 (2024) 37–44

Contents lists available at GrowingScience

Uncertain Supply Chain Management

homepage: www.GrowingScience.com/uscm

Collaborative enhancement of non-MSME credit and optimization of banking idle funds through P2P platforms

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A B S T R A C T

The market share of peer-to-peer (P2P) has shifted from dominating the P2P lending for Micro, Small, and Medium Enterprises (MSME) to non-MSME. Meanwhile, non-MSME credit is an incumbent main market share banking which possibly makes it a complementary or substitution in P2P lending in non-MSME bank credit. Furthermore, optimizing and maintaining liquidity is important due to banks utilizing intermediation functions. The strictness of bank liquidity could determine the management's response and policy in determining the best timing to utilize either the FinTech from the P2P platform or the customer's existing funds first. This study aims to assess the empirical findings of the effect of P2P lending on banking credit that is divided between provinces with strict, normal, and lax liquidity. This study uses data from 33 provinces in Indonesia between January 2022 to December 2022. The study approach uses a regression data panel for the data analysis. The results of this study show that P2P lending positively and significantly impacts bank credits of non-MSMEs in provinces with lax bank liquidity. The stricter the banking the lower the compliments of P2P loans against the bank credits of non-MSME. To the author's knowledge, no existing studies investigate the P2P lending of non-MSME banking credit that also consider the level of strictness of banking liquidity.

Article history:
Received May 28, 2023
Received in revised format July 29, 2023
Accepted October 24 2023
Available online October 26 2023

Keywords:
P2P lending
Banking
Non-UMKM
Liquidity
Fintech

1. Introduction

The main market of banking credit is non-MSME credit, as shown in Figure 1. Figure 1 indicates that in 2022, non-MSME credit dominates the market at 78.67%-79.05%. The issue of inconsistent information on MSME conveys a higher risk that makes banks prefer larger companies (Abdelhafid & Mohammed, 2019; Erdogan, 2019). The main market of non-MSME banking becomes more attentive to managing and growing its main market and considers the risks as well as upcoming and existing competitors. Recently, the finance sector was disrupted by the entrance of the financial technology (FinTech) banking service. The P2P platform is an innovative way to facilitate lending based on FinTech, where the potential lender can find loans through the P2P platform online (Kohardinata, Soewarno, et al., 2020). P2P loan online platform is becoming increasingly popular in facilitating the provision and lending of MSME in developing countries (Abbasi et al., 2021; Pengnate & Riggins, 2020). However, the phenomenon appears to be revered in Indonesia (Figure 2), whereby P2P lending between February to December 2022 is dominated by non-MSME loans at 62.05-65.55%, even though MSME loans dominated as high as 62.26% just in January 2022. The shift in the direction of P2P loans has entered the main share market of non-MSME banking to become a substitution or complement for banks.

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ISSN 2291-6830 (Online) - ISSN 2291-6822 (Print)

doi: 10.5267/j.uscm.2023.10.019

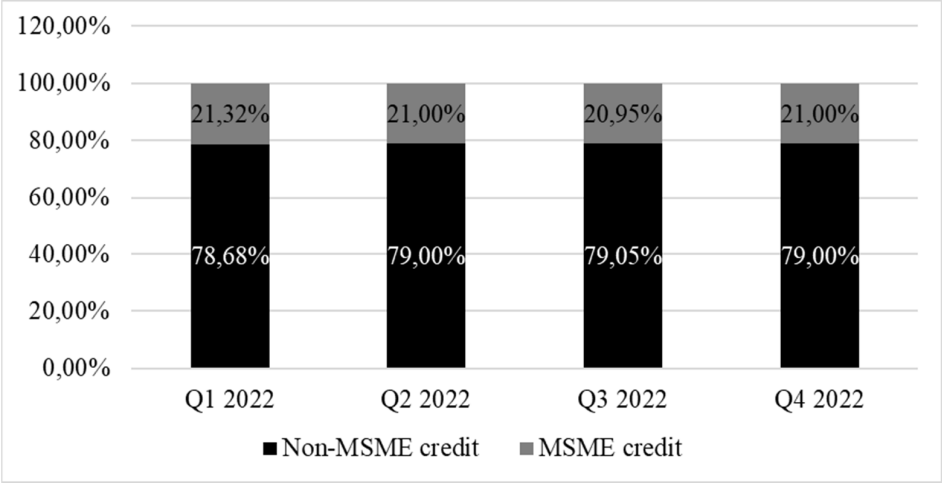
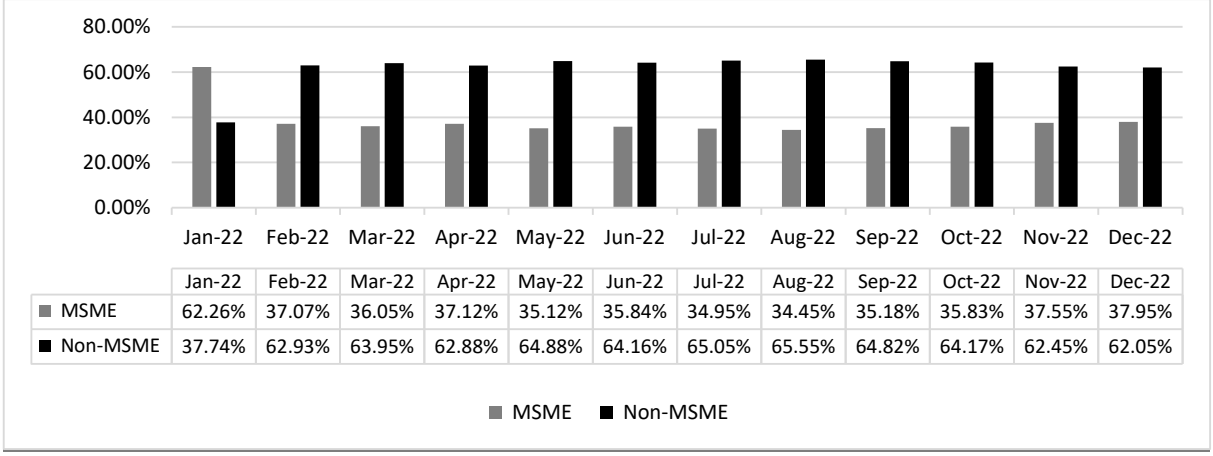


Fig. 1. The Proportion of Banking Credit of MSME and non-MSME
Source: Otoritas Jasa Keuangan (2023)



	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
MSME	62.26%	37.07%	36.05%	37.12%	35.12%	35.84%	34.95%	34.45%	35.18%	35.83%	37.55%	37.95%
Non-MSME	37.74%	62.93%	63.95%	62.88%	64.88%	64.16%	65.05%	65.55%	64.82%	64.17%	62.45%	62.05%

Fig. 2. The P2P loan proportion of MSME and non-MSME
Source: Otoritas Jasa Keuangan (2023)

Referring to disruptive innovation, upcoming businesses are first launched into the lower end of the market/MSME, which then will increase its performance to service the non-MSME main market that adopts the technology which becomes a disruptor for the incumbents (Kohardinata, Soewarno, et al., 2020; Montgomery et al., 2018). On the other hand, it can be acknowledged that the vast non-MSME credit market is created and built by banks over a long period and maintained by the development of technology over time. Therefore, the vastness of the non-MSME segment could have the potential of P2P lending being only in the niche market of the existing main market and operating as a complementary to the main market at which it is unable to reach the size to compete in the main market (Zhang et al., 2019). The existence of the substitution effect potential of the P2P platform against non-MSME credit market banking offers the opportunity to review the subject in depth. The researcher strengthens the relevancy of this study by reviewing literature about the effect of P2P lending against non-MSME credit across provinces based on the level of bank liquidity; lax, normal (as per regulation), and strict. The banking sector has a unique feature, which is operating business banking by optimizing debt in the form of account savings, however, the higher the debt means the higher the risk (Septina, 2022). Bank needs to manage liquidity by managing deposit funds which are then channeled through to the debtor in the form of credit (Berger & Bouwman, 2009; Werner, 2016). The researcher argued that bank management considers the level of liquidity as a priority in channeling credit via direct bank transfer or P2P platform. This study aims to search for empirical evidence of the effect of P2P lending on non-MSME bank credit by separating the analysis according to different provinces and levels of bank liquidity; lax, normal, or strict.

2. Materials

2.1. Theory Reconceptualization of Disruptive Innovation

Disruption is a gradual evolutionary process of products and services across time (Christensen, 1997; Christensen et al., 2015). The classic theory of disruptive innovation states that products introduced by new businesses service the low-end market first,

which is a less profitable segment for incumbents, which results in increased product performance to break through into the main banking market (Christensen et al., 2015). The classic disruptive innovation theory shows that the movement of each phase or track performance takes an equal amount of time, however, experts suggest that each phase requires a varying amount of time depending on the situation of each industry (Christensen et al., 2015, 2018). Fig. 3 illustrates the theory of reconceptualization of disruptive innovation that shows the early phases of new business plateau progress from time to time without disruption. The theory of reconceptualization of disruptive innovation indicates an idea that disruption is not caused by a single pattern across industries, and disruption may not happen in an industry at all (Christensen et al., 2018).

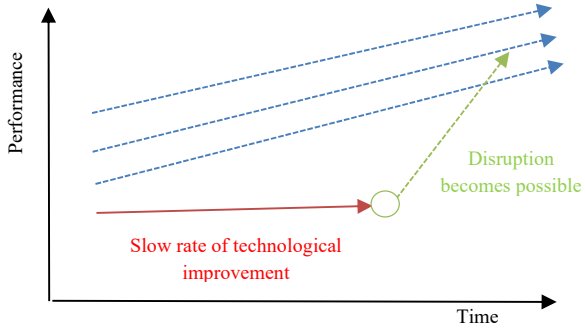


Fig. 3. *Kinks in improvement trajectories*
Source: Christensen et al., (2018)

The research focuses on the main banking market which is the non-MSME share market. The researcher perceives that the main banking market of non-MSME is not a market that is easily dominated by the P2P platform, hence, the P2P platform can progress slowly and perhaps take a longer time in phase two to service non-MSME debtors. Moreover, with the banking industry's characteristics being saturated (Das, 2017), the banking sector has continuously faced waves of technological advancement from time to time and has adapted to those changes. Therefore, the presence of newcomers, the P2P platform, does not easily challenge banks, especially servicing non-MSME debtors who are given easy access by banks. P2P platform prospects have yet to become a disruptor in the existing non-MSME credit market, perhaps only as a complement to banks instead.

2.2. Consumer Theory

The presence of newcomers enables two main options for incumbent businesses, be a potential substitute or a complementor. Consumer theory portrays products offered by newcomers are the potential complement of incumbent businesses if products from both companies can be utilized together (Aaker dan Keller, 1990; Levin dan Milgrom, 2004). On the contrary, products offered by newcomers could have a substitute effect if customers chose to use their product instead of products of incumbent businesses (Aaker dan Keller., 1990; Phan et al., 2019). P2P platform is not a substitute or disruptor in the main banking market, therefore, there could be a chance that P2P lending is a complement to non-MSME banking.

2.3. Financial Intermediation Theory

Based on the financial intermediation theory, a bank acts as an intermediary to channel funds from a variety of deposits and other investors within a short period to debtors with a longer due date (Admati & Hellwig, 2013; Werner, 2016). A thorough investigation of borrowers by banks potentially increases the efficiency and effectiveness of lending distribution, enabling greater excess funds for bad loans or higher loan interest (Admati & Hellwig, 2013). Financial intermediation theory is typically applied to banks as the intermediary, however in the modern financial intermediation theory, it demonstrates that banks play an important role in creating liquidity via long-term borrowing ((Berger & Bouwman, 2009; Werner, 2016). Financial intermediation theory showed that bank liquidity plays an important role in the existence of banks that can impact the distribution of bank loans.

In this study, financial intermediation theory is used due to its close link to bank liquidity. From the structural model perspective, the process of business banking is funded by the savings or debt of civilians, hence bank management holds the interest to channel credit to gain profit and hold the bank's survivability. From the perspective of the platform, P2P can become an alternative that has a collaboration potential with banks to execute intermediation functions when savings are idle, or bank liquidity is lax.

2.4. P2P Platform, Banking, and Bank Liquidity

Existing literature regarding the substitution or complementary effect of the P2P platform on banking has yet to identify a unified conclusion. Zhang et al., (2019) demonstrated that there is a shift in P2P platform influence, which starts positive toward banking when the P2P platform balance is lower and turns negative in the next regime. However, Kohardinata,

Suhardianto, et al., (2020) found indicators that P2P loans can shift from a substitution to a complement for banking credit since the collaboration with the bank's public credit.

The researcher views the P2P platform as having the potential as a complement. This is based on the reconceptualization of the disruptive innovation theory and consumer theory. The disruption may not yet be observable in all areas and possibly uncertain at the same level or pattern across industries (Christensen et al., 2018). The banking sector is one of the sectors highly saturated by technology (Das, 2017). The researcher argues that it is not easy for P2P platforms to replace facilities offered by banks quickly. Future banks will depend on the capacity to gain customers as a result of responsible risk-taking and proactivity as well as increasing the service that completes each other rather than replacing (Anagnostopoulos, 2018). The relationship between newcomers (P2P platform) and incumbents (banking) is not about "winner takes it all" or "first mover gains", but rather new credit entrants that complete the traditional role of banking (Anagnostopoulos, 2018; Bollaert et al., 2021).

From the perspective of bank liquidity, the excessive increase of bank credit distribution or strict liquidity (LDR) reflects higher risk or risk-seeking banks (Nuhiu et al., 2017; Pop et al., 2018). The moral hazard of bank management agents is that they might take too much risk to get incentives (Acharya & Naqvi, 2012; Umar & Sun, 2016; D. Zhang et al., 2016). Banks with applied strict or normal liquidity may reflect management that focuses on optimizing credits in that province and gain as many shares in those provinces. Therefore, it is highly likely that the P2P platform has yet to have the opportunity to penetrate those provinces freely due to the domination of incumbent banks. From the perspective of lax bank liquidity, P2P lending online is an effective complement to traditional financial organizations and beneficial for utilizing idle funds (Jiang et al., 2018; Kohardinata, Suhardianto, et al., 2020).

A few things can be concluded to create the following hypothesis: (1) P2P platform prospect is yet to be a substitute to banking, therefore, it becomes a complement, (2) potential normal and strict bank liquidity reflects the ability of banks to optimize their funds so P2P platform may not be able to gain the market, (3) lax liquidity bank reflects idle funds that can be used by P2P platform as channelling for fund distribution. Existing literature has narrowed the hypothesis that indicates:

H_1: P2P lending positively affects non-MSME banking credit in lax bank liquidity than normal and strict bank liquidity.

3. Methods

The research approach used for the research model is adjusted based on the data. This study uses data from 33 provinces in Indonesia between January to December 2022. The provinces are DKI Jakarta, Jawa Barat, Banten, Jawa Timur, Jawa Tengah, dan D.I Yogyakarta. The provinces outside of Java Island include "Bengkulu, Jambi, Aceh, North Sumatera, West Sumatera, Riau, Riau Islands, South Sumatera, Bangka Belitung, Lampung, South Kalimantan, West Kalimantan, East Kalimantan, Central Kalimantan, Central Sulawesi, South Sulawesi, North Sulawesi, Southeast Sulawesi, West Sulawesi, Gorontalo, West Nusa Tenggara, Bali, East Nusa Tenggara". Given the type of data is "cross-section" and "time series", regression data panel is used to assess the research model.

Model 1 is the research model used in this study. Model (1) reflects the effect of P2P lending as the independent variable to non-MSME bank credit (non-MSME), meanwhile, bank savings (SAV), and the number of banks in each province (BO) are the control variables of this study. More detailed information on the variables is shown in Table 1.

$$Non\ MSMEit = \alpha + \beta_1 P2P_{it} + \beta_2 SAV_{it} + \beta_2 BO_{it} + \mathcal{E} \quad (1)$$

Table 1
The Dependent, Independent, and Control Variable

Variable	Measurement
	Dependent Variable
Non-MSME	Bank credit for the non-MSME debtors in each province
	Independent Variable
P2P	Peer-to-peer Loans (P2P) are in each province
	Control Variable
SAV	Bank Saving (current account, savings account, deposit account) in each province
BO	The Total number of Bank Office in each province
Number of provinces (i)	
Number of months (t)	

The study analysis divides the sample into three liquidity conditions which is the contrast of credit and savings. The three-liquidity condition was based on the banking standard, which is: (1) lax bank liquidity with 78% liquidity, (2) standard bank liquidity (normal) between 78%-92%, and (3) strict liquidity condition, where the ratio of bank lending to savings is above 100%.

4. Results

This section will discuss the results of the study, which consists of descriptive statistics, model testing, and hypothesis testing.

4.1. Descriptive Statistics

The descriptive statistics result is shown in Table 2. There are 130 observations in this sample (N=130), consisting of 12 provinces (n=12), with a T-Bar = 10.83, indicating an unbalanced panel.

Table 2
The Descriptive Statistics of Lax Bank Liquidity Condition

Variable		Mean	Std. Dev.	Min	Max	Obsv
Non-MSME	overall	330,800.40	796,407.00	2,617.36	2,985,258.00	N = 130 n = 12 T-bar = 10.83
	between		791,271.90	2,789.12	2,799,478.00	
	within		44,125.41	83,295.02	516,580.50	
P2P	overall	977.53	1,512.11	23.79	6,552.89	
	between		1,498.79	33.26	5,055.98	
	within		219.94	- 122.24	2,474.45	
SAV	overall	535,189.70	1,122,449.00	23,961.41	4,373,923.00	
	between		1,117,038.00	26,460.11	3,991,774.00	
	within		49,558.61	384,707.50	917,338.20	
BO	overall	152.68	140.13	31.00	462.00	
	between		140.46	31.00	456.42	
	within		2.33	140.93	158.27	

Table 3 shows the descriptive statistics of samples with normal bank liquidity that reflect 77 observations (N=77), consisting of 8 provinces (n=8), and T-Bar = 9.63, which indicates an unbalanced panel.

Table 3
The Descriptive Statistics of Normal Bank Liquidity Condition

Variable		Mean	Std. Dev.	Min	Max	Obsv
Non -MSME	overall	110,072.50	113,087.40	10,487.61	357,981.60	N = 77 n = 8 T-bar = 9.63
	between		113,555.00	10,646.22	343,808.80	
	within		4,198.12	93,310.90	124,245.30	
P2P	overall	1,039.74	1,636.52	17.65	5,948.83	
	between		1,591.30	17.90	4,656.70	
	within		229.80	- 120.33	2,331.87	
SAV	overall	202,932.20	208,927.30	17,962.05	632,629.10	
	between		208,927.60	18,109.56	611,923.10	
	within		4,672.50	188,715.90	223,638.20	
BO	overall	165.82	134.62	29.00	396.00	
	between		136.55	29.67	390.17	
	within		3.41	150.65	171.65	

Table 4 shows the descriptive statistics of the sample of strict bank liquidity that reflects 189 observations (N=189), consisting of 16 provinces (n=16), and T-Bar = 11.81 which means it is an unbalanced panel.

Table 4
The Descriptive Statistics of Strict Bank Liquidity Condition

Variable		Mean	Std. Dev.	Min	Max	Obsv
Non-MSME	overall	24,752.94	17,697.18	3,649.20	81,814.16	N = 189 n = 16 T-bar = 11.81
	between		18,152.94	4,074.97	78,543.34	
	within		944.10	20,480.35	28,023.76	
P2P	overall	96.21	82.01	10.72	334.14	
	between		81.92	14.98	284.63	
	within		20.11	- 0.64	180.41	
SAV	overall	33,231.12	25,465.63	5,703.83	114,842.90	
	between		26,099.95	6,014.00	112,703.70	
	within		1,035.96	29,301.49	38,645.57	
BO	overall	51.35	29.02	16.00	137.00	
	between		29.78	16.33	136.58	
	within		0.86	47.60	53.94	

4.2. Model Testing Results

Table 5 illustrates the research model used in this study, where samples are divided into the three bank liquidity conditions. The result from Table 5 columns 1 indicates that the Chow test ($p > F$) and Hausman test are 0.0000, therefore, the fixed

effect (FE) model is the best fit. The VIF value of 10.04 suggests that there is a multicollinearity, albeit, not perfect multicollinearity, it does not affect the main results of this research. The test results of heteroskedasticity and autocorrelation are 0.0000. Therefore, the regression of the data panel required clustering of standard errors to fix the heteroskedasticity and autocorrelation (Hoechle, 2007).

Table 5
Research Model Testing for Lax, Normal, and Strict Bank Liquidity Conditions

	Non-MSME Banking Credit		
	Lax Bank Liquidity (1)	Normal Bank Liquidity (2)	Strict Bank Liquidity (3)
Chow Test (Prob > F)	0.0000	0.0000	0.0000
Hausman Test	0.0000	0.2860	0.1050
Lagrangian Multiplier	-	0.0000	0.0000
Model Best Fit	FE	RE	RE
VIF	10.04	183.42	21.76
Modified Wald test (Heteroskedasticity test)	0.0000	-	-
Wooldridge test (Autocorrelation test)	0.0000	-	-

The test result shown in Table 5 columns 2 and columns 3 indicated a significant Chow test (p > F), and an insignificant Hausman test, as well as the Lagrangian multiplier value of 0.0000. Therefore, the best-fit research model is the Random Effect (RE). To analyze the regression data panel using RE, heteroskedasticity and autocorrelation tests are not required.

4.3. Hypothesis Test Results

The F-test shown in columns 1-3 of Table 6 illustrates a significant value. Therefore, it can be concluded that the research model can explain the dependent variables of non-MSME banking credit for the three liquidity conditions. Column 1 of Table 6 shows the result of the P2P effect on lax non-MSME bank credit conditions. The result shows that P2P positively affects lax non-MSME bank credit with a coefficient = 57.86. The SAV control variable positively affects non-MSME bank credit with a coefficient of 0.713, whilst variable BO has no significant impact. The independent and control variables of this study can explain 71.8% of the dependent variable (R2 = .718). Table 6 columns 2 shows the effect of P2P lending on the normal non-MSME bank liquidity. P2P lending does not significantly affect normal non-MSME bank liquidity. Variable SAV positively affects the non-MSME, with a coefficient value of .589. Variable BO negatively affects non-MSME banking credit with a coefficient value of -139.9. It can be concluded that this model could explain 98.15% of the dependent variable (R2 = .9815).

Table 6
The Results of Hypothesis Testing

Variable	Non-MSME Credit		
	Lax Bank Liquidity (1)	Normal Bank Liquidity (2)	Strict Bank Liquidity (3)
P2P	57.86***	3.025*	1.947
	(17.20)	(1.612)	(3.139)
SAV	0.713***	0.589***	0.555***
	(0.0185)	(0.0439)	(0.0450)
BO	3,787	-139.9**	71.18*
	(2,573)	(62.77)	(42.12)
Constant	-685,808	8,353	2,421
	(419,186)	(8,720)	(2,327)
Prob>F	0.0000	0.0000	0.0000
R-squared	0.718	0.9815	0.9349

Robust standard errors in parentheses; *** $p<.01$, ** $p<.05$, * $p<.1$

Table 6 column 3 shows the results of the effect of P2P lending on non-MSME bank credit on strict liquidity. The result demonstrated that P2P lending did not significantly affect non-MSME banking credit in strict liquidity situations, however, is significant at p < .90. Variable SAV is found to be significant against non-MSME bank credit with strict liquidity, with a coefficient value of .555. Variable BO indicated non-significant against non-MSME credit with strict liquidity. The independent variable could explain 93.49% of the dependent variable ($R^2 = 0.9349$). Based on the results in Table 6, it can be concluded that the hypothesis can be accepted. P2P lending has a positive significant effect on lax bank liquidity, meanwhile, it is non-significant for normal and strict bank liquidity conditions.

5. Discussion

The function of banking as an intermediary is visible in this study. The savings fund availability of clients plays an important role in supporting the distribution of banking credit to the public, regardless of the condition of the banking liquidity across provinces. Banking as an intermediary function manages people's savings and distributes them in the form of credit (Berger & Bouwman, 2009; Werner, 2016). However, banks in some provinces have limitations to optimally distribute savings in

the form of credit. Therefore, some provinces continue to have lax liquidity. For provinces with lax liquidity, an alternative solution to distribute bank credits is required. There is a contemporary alternative to intermediate funds which is P2P lending that has widely spread in Indonesia. The looseness of liquidity in certain provinces reflects the limited banking management to perform non-MSME credit expansion. This is where the P2P platform utilizes FinTech, artificial intelligence, and machine learning to assist the platform in becoming a complement to banks distributing idle funds. Bank Management has an important intermediary function to optimize idle funds to gain incentives, so collaborating with the P2P platform to increase fund distribution performance to non-MSME debtors is logical.

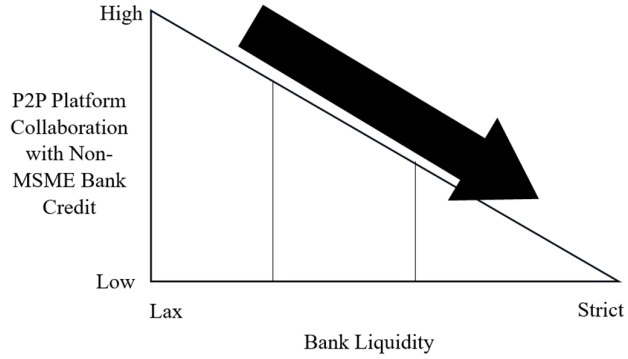


Fig. 4. The P2P Platform Collaboration with Non-MSME Bank Credit Based on Bank Liquidity

Banking is one of the sectors where the funding structure is funded by debt in the form of clients' savings. The opportunity is available in a few provinces, resulting in the maximization of the use of savings to support the public's credit borrowing as much as possible, hence bank liquidity is in a normal or strict condition for those provinces. In provinces with normal to strict liquidity conditions like these, bank management takes advantage of the opportunity on a large scale or non-MSME, therefore, the role of a P2P platform for non-MSME credit distribution is less significant. Figure 4 is an illustration created by the researcher to help understand the pattern of the complement of P2P lending of non-MSME banking credit with bank liquidity. The role of P2P platforms as complements to non-MSME banking credit is diminishing in provinces with increasingly strict liquidity. Bank management needs the P2P platform if there are idle or excess funds to be distributed to the public.

6. Conclusions

This study examines the effect of P2P lending on non-MSME banking credit that is assessed individually according to each province and the level of bank liquidity. The result of this study indicates that P2P lending positively affects non-MSME credit banking in provinces with laxer liquidity. The stricter the bank liquidity the lower the role of the P2P platform as a complement for non-MSME bank credit. The result of this study also indicates that bank management collaborates with the P2P platform when they require an alternative intermediary to distribute idle funds.

The empirical testing implied that bank management has idle funds that can optimize the collaboration with the P2P platform to take advantage of non-MSME credit and increase banking performance. The P2P platform manager who wants to service the larger market or non-MSME could consider looking at provinces or banks that have excess funds to collaborate in distributing funds and increasing the performance of the P2P platform.

Author Contributions: Conceptualization, methodology, software, formal analysis, and writing—original draft preparation, Kohardinata, C; writing— review and editing and revision, supervision: Widianingsih, L. P; resources and data curation, Stanley, N; project administration and funding acquisition, Junianto, Y; project administration, Ismawati, A. F; review and visualization, Sari, E.T. All authors have read and agreed to the published version of the manuscript.
Funding: This research was funded by Kementerian Pendidikan, Kebudayaan, Riset dan Teknologi, Indonesia, as grant research.
Data Availability Statement: Data is contained within the article or supplementary material.
Conflicts of Interest: The authors declare no conflict of interest.

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