DO WE NEED P2P BETWEEN BANK THIRD-PARTY FUNDS AND BANK CREDIT?

Cliff Kohardinata[1], Luky Patricia Widianingsih[2]
Universitas Ciputra Surabaya [1,2]
ckohardinata@ciputra.ac.id[1]
luky.patricia@ciputra.ac.id[2]

ARTICLE INFO

Article history:
Received: 16 May 2023
Revised: 21 June 2023
Accepted: 26 June 2023

Keywords:
Peer-to-peer Lending; Third-party funds; Banking credit; Financial Inclusion; FinTech

DOI:
https://doi.org/10.33508/rima.v6i1.4654

ABSTRACT
The main objective of this study is to obtain empirical evidence on the role of peer-to-peer (P2P) lending mediation in bridging the relationship between banking third-party funds and bank credit in provinces with fewer branch offices or limited banking services. The test used is path analysis involving 33 provinces in Indonesia from January to July 2022. The main results of this study show that third-party funds in provinces with fewer banking branch offices do not affect bank credit, but P2P lending can mediate the relationship between banking third-party funds and bank credit in provinces with fewer banking branch offices. The additional results of this study indicate that third-party banking funds in provinces with more bank branch offices positively affect bank credit. The novelty of this research is that the researchers introduced the P2P lending mediating variable based on financial technology (FinTech) as a solution for provinces with limited access and exposure to banking to bridge the distribution of third-party funds to debtors, thereby increasing financial inclusion.

INTRODUCTION

Banks' presence enables the community to carry out the intermediary function, thus improving people's welfare and enabling economic growth. Banks collect money from various depositors and investors in the short term and then distribute it to debtors with longer maturities (Admati & Hellwig, 2013; Werner, 2016). Banks play a crucial role in facilitating the intermediary function, enhancing welfare, and driving economic growth.

However, Table 1 shows that the banking offices in provinces are not evenly distributed from one province to another. This is very reasonable because banks also have limited resources and their considerations and calculations in deciding to open branch offices in each province in Indonesia. This indicates that banks face limitations in reaching out and distributing funds to all provinces in Indonesia.

The inequality in banking facilities in various provinces in Indonesia is also reflected in low financial literacy and inclusion in Indonesia. The 2019 National Financial Literacy and Inclusion Survey (SNLIK) shows that the financial literacy index in Indonesia is 38.03%, and the financial inclusion index is 76.19% (Otoritas Jasa Keuangan, 2021). This shows that many Indonesians still do not understand financial services, and some still do not have access to banking. Hence, banking third-party funds have a limited capacity to

collect and distribute in the form of credit in the province.

Inequality in banking branch offices is an important issue to address to increase financial literacy and inclusion in Indonesia. One possible solution is the use of financial technology (FinTech) to be able to serve the community without relying on "brick-and-mortar branches" (Coetzee, 2018).

The peer-to-peer (P2P) platform is a FinTech-based innovation that provides financial services to bring together lenders and borrowers via the Internet (Ramlall, 2018). Bankable customers can be served through existing financing products and services (provided by banks), while un-bankable customers can use products and services provided by FinTech (Iman, 2019). P2P startup companies have developed rapidly in Indonesia; the presence of the P2P platform is expected to help banks increase financial literacy, financial inclusion, and bank credit channeling.

Table 1. Number of Conventional Banking Offices in Indonesia in 2021

Province	Num. of offices	Province	Num. of offices	Province	Num. of offices
Jakarta	456	West Kalimantan	81	Central Sulawesi	46
East Java	408	South Kalimantan	73	Southeast Sulawesi	45
West Java	398	Lampung	66	Bengkulu	35
Central Java	332	Jambi	65	Maluku	35
North Sumatera	204	Papua	64	Bangka Belitung	31
South Sulawesi	137	Aceh	62	West Irian Jaya	28
East Kalimantan	118	North Sulawesi	62	North Maluku	23
South Sumatera	108	Yogyakarta	61	Gorontalo	19
Banten	104	Riau	61	West Sulawesi	16
Riau	91	East Nusa Tenggara	59		
Bali	90	West Nusa Tenggara	55		
West Sumatera	88	Central Kalimantan	47		

Source: Otoritas Jasa Keuangan, 2021a

Previous studies have only shown the effect of P2P loans on bank credit. Several studies have shown that P2P lending has a negative effect on MSME bank credit and its function as a substitute for serving infra-marginal bank borrowers (Kohardinata, Soewarno et al., 2020; Tang, 2019). Other research discussed the shift in the effect of P2P lending on bank credit, from P2P lending as a complement to being a substitute for bank credit (Zhang et al., 2019), but on the other hand, for rural bank credit, it shifts from substitution to being complementary (Kohardinata, Suhardianto, et al., 2020). Other studies have also shown that P2P lending does not affect bank credit because the size to compete for P2P platforms is still tiny, so they cannot compete or replace banks in a short time (Kohardinata, Soewarno et al., 2020; Thakor, 2020) Competing with fintech startup (P2P) is not the only way out for banks, because there are possibilities for collaboration and partnerships by focusing on each core capability(Iman, 2019).

In this study, researchers put forward the view that the core capabilities of P2P

platforms in their flexibility, information technology system, and coverage of areas without the need for a physical presence can be a mediator that assists banks in carrying out intermediary functions. Therefore, this research offers novelty and empirical evidence that P2P lending is a mediator that bridges banking third-party funds with bank credit in provinces with fewer banking branch offices. The presence of the P2P lending variable as a variable that performs an intermediary function in the relationship between third-party funds and bank credit in provinces with fewer banking branch offices is the uniqueness of this research. To the researcher's knowledge, no prior studies have investigated the implementation of P2P lending as a mediating variable or as an intermediation function between third-party funds and bank credit, specifically in provinces with a limited number of banking branch offices.

The main objective of this research is to find empirical evidence regarding the intermediary role of peer-to-peer (P2P) lending on the effect of third-party bank funds (SAV) on bank credit (CR) in Indonesian provinces with fewer banking branch offices. This study conducts tests through several stages: (1) testing the effect of third-party funds on bank credit in provinces with a more significant number of banking branch offices, then (2) testing the effect of third-party funds on bank credit in provinces with fewer banking branch offices. Finally, (3) the mediation test for P2P lending on the effect of third-party funds on bank credit is conducted in Indonesian provinces with fewer banking branch offices.

This research aims to empirically demonstrate the mediating effect of P2P lending in the relationship between third-party funds from banking institutions and bank credit in Indonesian provinces with fewer banking branch offices. This research contributes to developing financial and banking knowledge and provides practical implications for banks, P2P platforms, and the government. The structure of this paper comprises (1) a literature review on intermediation theory, P2P platforms, and banking, as well as hypothesis development, (2) a research method, (3) results and discussion, and (4) conclusions.

LITERATURE REVIEW

This section provides a comprehensive overview of the theoretical framework and reviews the relevant literature.

Intermediation Theory

Based on the theory of financial intermediation, banks act as intermediaries to channel money from various depositors and other investors in the short term to be distributed to debtors with longer maturities (Admati & Hellwig, 2013; Werner, 2016). Thorough investigations from the bank to the borrowing client allow for increased lending efficiency and effectiveness to avoid wasting more money on bad loans or possibly higher loan interest rates (Admati & Hellwig, 2013). Conventional financial intermediation theory often only emphasizes banks as financial intermediaries, but modern financial intermediation theory shows that banks have an important role to play in creating liquidity through lending to depositors with short terms and lending to depositors with longer terms (Berger & Bouwman, 2009; Werner, 2016). Therefore, the role of third-party funds in banks holds the utmost significance in facilitating lending activities and ensuring optimal bank liquidity.

Banks have their limitations and considerations in adding branch offices to distribute lending in the provinces. FinTech or P2P platforms open opportunities to promote financial inclusion for populations that are not being or challenging to be served by banks (Kohardinata, Soewarno, et al., 2020; Zalan & Toufaily, 2017). P2P (FinTech) lending is one of the most promising options for expanding the functions of traditional financial intermediaries, such as banking and

interacting with retail banking clients (Lavryk, 2016; Sloboda et al., 2018). The theory of financial intermediation is used in this study to introduce an intermediation alternative for banks, namely through P2P startup companies. It is expected to be able to fill the gap through collaboration with banks to fill the limitations of banks in channeling third-party funds to provinces with fewer branch offices.

P2P Platforms and Banking

Rapidly developing technology provides new trends for the financial services market and encourages the development of FinTech in society. FinTech prioritizes using technology to provide new, better financial services where the motivation for its emergence is present because information technology has produced various products, but financial intermediation costs have not changed much. Thus, FinTech is expected to provide an easier way to overcome financial contract friction and reduce financial service costs (Thakor, 2020).

P2P stands for "peer-to-peer", which means person to person. P2P is one of the credits using FinTech, which provides services to bring lenders together with parties who need funds online (Petrushenko et al., 2018; Ramlall, 2018). The P2P financial market helps investors and borrowers invest or obtain lending without a banking intermediary function (Taujanskaite & Milcius, 2022). The relationship between P2P lending and banking is still interesting because the research results are inconclusive. Some research shows that the effect of P2P lending on banks shifts from a positive effect when P2P lending is still small to a negative one when P2P is getting bigger (Zhang et al., 2019).

In contrast, other research shows that P2P lending shifts from a substitute to a compliment for Rural Bank credit after P2P lending collaborates with Rural Banks (Kohardinata, Suhardianto, et al., 2020). This aligns with Zhao et al. (2022), who stated that the relationship between traditional banks and the FinTech industry has gradually developed from competition to cooperation. P2P fintech can help banks provide SMEs or small-scale lending access to meet the company's liquidity needs (Abbasi et al., 2021; Tang, 2019). The P2P platform is believed to be able to assist and collaborate with banks in leveraging unused third-party funds to be channeled in the form of loans or lending in underserved regions.

The researcher uses the last argument from this presentation, namely that P2P platforms have developed to be complementary and collaborative with banks to channel lending so that P2P platforms can be used as mediators or intermediation to serve areas that banks have not reached.

Based on the theory of intermediation and previous studies utilized in this section, the hypothesis proposed in this research is as follows: H1: P2P lending can mediate the relationship between third-party funds from banking institutions and bank credit in Indonesian provinces with fewer banking branch offices.

RESEARCH METHOD

This research study investigates the financial sector, encompassing peer-to-peer (P2P) platforms and traditional banking institutions, specifically focusing on their interrelationship and dynamics. Testing in this study consists of several stages, namely:

1. Testing the effect of third-party funds on bank credit in provinces with more branch offices.
2. Testing the effect of third-party funds on bank credit in provinces with fewer branch offices.
3. Testing the mediation of P2P lending on the effect of third-party funds on bank credit in provinces with fewer banking branch offices.

Tests were carried out in stages to show the effect of third-party funds on bank credit at a more significant number of banking branch offices than with fewer.

Further research is conducted to show the role of P2P mediation in provinces with fewer banking branch offices to support the distribution of third-party funds in bank lending.

The data used in this study is data on P2P lending and banking credit at the provincial level from January to July 2022 in 33 provinces in Indonesia, provided by the Financial Services Authority (OJK). This study does not use North Kalimantan Province due to limited data provided by OJK. The median separates and groups the number of banking branch offices; the number of banking branch offices in a province is said to be small if it is less than the median value. The mechanism mentioned above serves as the foundation for selecting and segregating the research samples in this study.

The data that has been collected is then tested using the Ordinary Least-Squared approach. Testing begins with normality testing using kurtosis skewness, then multicollinearity testing using the variance inflation factor (VIF), and heteroscedasticity testing using the Breusch-Pagan and Cook-Weisberg tests. The research model used in this study is:

$$CR = \alpha + \beta 1\ SAV + \beta 3\ OF + \varepsilon \quad (1)$$

Information:

CR = Natural logarithm (Ln) of Conventional banking credit at the provincial level.
SAV = Natural logarithm (Ln) of Third-party banking funds at the provincial level.
OF = Natural logarithm (Ln), the number of banking branch offices.

Model 1 demonstrates that the research model's dependent variable is bank credit (CR), the independent variable under this research is third-party funds (SAV), and this research incorporates the control variable of the number of banking branch offices (OF).

Figure 1 is the model used to estimate the mediation of P2P variables through path analysis. The Sobel test estimates mediation in this study (Baron & Kenny, 1986). The mediation used in this study is peer-to-peer lending (P2P) as mediation between a bank third party (SAV) and bank credit (CR).

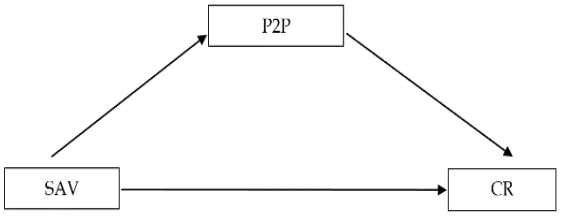

Figure 1. Research Model using P2P Mediation

Information:
SAV = Natural logarithm (Ln) of Third-party banking funds at the provincial level.
CR = Natural logarithm (Ln) of Conventional banking credit at the provincial level.
P2P = Natural logarithm (Ln) of P2P lending at the provincial level.

RESULT AND DISCUSSION

This section presents a comprehensive analysis of the empirical test results, providing a detailed discussion and interpretation of the outcomes.

Descriptive Statistics

Table 2 presents descriptive statistics of tests conducted on conditions with a lower and higher number of banking branch offices in the provinces of Indonesia. The researchers meticulously excluded outlier data from the analysis, ensuring the reliability and integrity of the findings; hence, the data used in this study amount to 115 observations on tests with the condition of a more significant number of banking branch offices and 111 observations with the condition of fewer number of banking branch offices.

In Table 2, for banks with a more significant number of branch offices (a), it can be seen that the average P2P lending is 6.7745 (std dev= 1.3683) with a value of 3.9166 to 9.3642. The average bank credit is

11.8200 (std dev= 1.11343) with a min value of 10.3703 and a max value of 14.9155. The average banking SAV is 12.0103 (std dev= 1.1651) with a min value of 10.6623 and a max value of 15.1858, and the average number of banking branches is 4.8992 (std dev=0.6765), with a minimum value of 4.1589 and a maximum value of 6.1247. In Table 2, for banks with a fewer number of branch offices, it can be seen that the average P2P lending is 4.7477 (std dev= 0.8330118), which varies from 3.05634 to 6.37261. The average bank credit is 10.2010 (std dev= 0.5339) with a min value of 9.21169 and a max value of 10.9303. The average banking SAV is 10.0726 (std dev= 0.7382) with a min value of 9.21169 and a max value of 10.9303, and the average number of banking branches is 3.6929 (std dev=0.4329) with a minimum value of 2.7726 and a maximum value of 4.1271.

Table 2. Descriptive Statistics of Greater and Fewer Branch Offices

Banks with a Greater Number of Branch Offices (a)					
Variables	**Obs**	**Averages**	**Std. Dev.**	**Min**	**Max**
P2P	115	6.774509	1.368296	3.91661	9.36417
CR	115	11.82	1.11343	10.3703	14.9155
SAV	115	12.01033	1.165112	10.6623	15.1858
OF	115	4.89917	0.6765409	4.158883	6.124683
Banks with Fewer Branch Offices (b)					
P2P	111	4.747738	0.8330118	3.05634	6.37261
CR	111	10.20093	0.5339138	9.21169	10.9303
SAV	111	10.07257	0.7381752	8.67939	11.2518
OF	111	3.692859	0.4329002	2.772589	4.127134

Empirical Results

This section presents the findings derived from the empirical test conducted.

The Effect of P2P Lending on Banking Credit in the Condition of Greater and Fewer Banking Branch Offices

The normality test results on the model of the influence of P2P lending on bank credit in the condition of greater and fewer banking branch offices show a value of more than 0.2388, so it can be concluded that the errors of this research model are normally distributed. The VIF value is 6.53, so it can be concluded that there is no symptom of multicollinearity. The result of the heteroscedasticity test is 0.0515 or above 0.05 because the result of the heteroscedasticity test is close to 0.05, so researchers used a robust standard error to detect and resolve potential heteroscedasticity problems (Hoechle, 2007). The result of prob>F shows a significant result of 0.0000, so it can be concluded that the model used can explain bank credit.

The results of the study in Table 3a show that when the number of banking offices is more significant, third-party funds have a positive effect on bank credit with a coefficient of 0.805, and the number of banking offices has a positive effect on bank credit with a coefficient of 0.259, with R-squared of 0.979 or 97.90%, it indicates that this independent variable can explain the dependent variable up to 97.90%. Table 3b shows that when the number of banking offices is less, third-party funds have no effect on bank credit with a coefficient of 0.140, and the number of banking offices has a positive effect on bank credit with a coefficient of 0.884, where the R-squared is 0.813 or 81.30%, Which means that this

model can explain the dependent variable up to 81.30%.

The results show that third-party funds (SAV) in the condition of fewer banking branch offices do not affect bank credit, while banking branch offices have an important role in increasing credit distribution. This empirical result proves that banks face challenges distributing third-party funds in areas with fewer branch offices. It suggests that those areas may not be the primary targets for banks regarding credit distribution. Therefore, the limitedness and importance of banking branch offices in these provinces require mediation between third-party funds and bank credit as a means of credit channeling.

Therefore, this study proposes using P2P lending mediation as an intermediary between parties who need funds and distribute lending.

Table 3. Regression Test Results of the Effect of P2P Lending on Banking Credit

	CR	
Variables	**(a)***	**(b)***
SAV	0.805***	0.140
	(0.0313)	(0.0781)
OF	0.259***	0.884***
	(0.0436)	(0.127)
Constant	0.879***	5.524***
	(0.204)	(0.394)
Observations	115	111
R-squared	0.979	0.813

*** p<0.01, ** p<0.05

*Banks with Greater Number of Branch Offices (a); Banks with Fewer Number of Branch Offices (b)

Mediation Test of P2P Lending on the Effect of Third-Party Funds on Banking Credit in Fewer Number of Banking Branch Offices.

Classical assumptions on each path must be fulfilled before carrying out the mediation test using path analysis. In the first path, namely the path with the P2P mediating variable as the dependent variable and third-party funds as the independent variable, the Skewness/Kurtosis value is 0.2929, so it can be concluded that the errors are normally distributed. Furthermore, the VIF value is 8.72 or below 10, so it can be concluded that there is no symptom of multicollinearity. Meanwhile, in the heteroscedasticity test, symptoms of heteroscedasticity are found because the result is 0.0003, so the researchers used a robust standard error to solve this heteroscedasticity problem.

The second path is the path with the independent variable of bank credit and P2P mediation variables and third-party funds as an independent variable, with a Skewness/Kurtosis value of 0.0530 or above 0.05; so it can be concluded that the errors of the model used are typically distributed. The VIF (variance inflation factor) value is 7.03 or below 10. Hence, it can be inferred that there are no symptoms of multicollinearity in this research model. Furthermore, the result of the heteroscedasticity test is 0.4366, indicating no symptom of heteroscedasticity in this research model.

Table 4. Path Analysis Test Results at Fewer banking branch offices

Variables	P2P (a)	CR (b)
P2P		0.292***
		(0.0277)
SAV	0.926***	-0.131
	(0.209)	(0.0675)
OF	-0.175	0.936***
	(0.383)	(0.107)
Constant	-3.933***	6.674***
	(0.977)	(0.311)
Observations	111	111

*** p<0.01, ** p<0.05

Table 4a presents the empirical results indicating that third-party funds (SAV) exhibit a statistically significant positive effect on P2P lending (P2P), with a coefficient of 0.926. On the other hand, the number of banking offices (OF) does not demonstrate any significant impact on P2P lending, with a coefficient of -0.175. In Table 4b, the findings reveal a significant positive effect of P2P lending (P2P) on banking credit (CR) with a coefficient of 0.292. However, third-party funds (SAV) do not impact banking credit significantly. In contrast, the number of banking offices (OF) exhibits a statistically significant positive effect on banking credit (CR), with a coefficient of 0.936.

The results of the Sobel test yielded a value of 4.08, which is above 1.96. Thus, it can be concluded that the empirical tests have demonstrated the mediating effect of P2P lending on the relationship between third-party funds (SAV) and bank credit when the number of bank branch offices in the province is relatively low. Therefore, the hypothesis proposed by researchers regarding P2P platforms as a mediation or intermediary between third-party funds relationships and bank loans in Indonesian banking has been proven.

In a province with more banking branch offices, it is indicated that higher third-party funds will positively support lending disbursement. The large number of banking branch offices in the province reflects the high level of financial literacy and inclusion in society, indicating that people are used to and have access to banking facilities. Therefore, the banking intermediation function is running well so that third-party funds in the province can be channeled in the form of credit.

The research results in provinces with fewer banking branch offices show that third-party funds in banks do not significantly affect bank lending disbursement. The results of this study indicate that there are limitations to banking services in collecting third-party funds and distributing lending evenly in provinces with relatively few banking branch offices or the presence of un-bankable customers. Therefore, the presence of FinTech or P2P platforms is expected to be the answer for unbanked customers to gain access to finance.

The study results show that the P2P platform has a complementary role as an intermediary in utilizing third-party bank funds for bank lending in provinces with fewer banking branch offices. The intermediary function of banking is still limited because banks rely on bricks and mortar to develop their market. Competition between banks as incumbents and challengers (P2P platforms) has paved the way for collaboration or cooperation (Anagnostopoulos, 2018; Kohardinata, Suhardianto et al., 2020; Zhao et al., 2022). Banking has a legacy, financial expertise,

infrastructure, and stable old customers, whereas FinTech has agility, innovation, and a future customer base (Anagnostopoulos, 2018). Their respective advantages in banking and the P2P platform can result in good collaboration to increase financial inclusion in provinces that still lack services from banks.

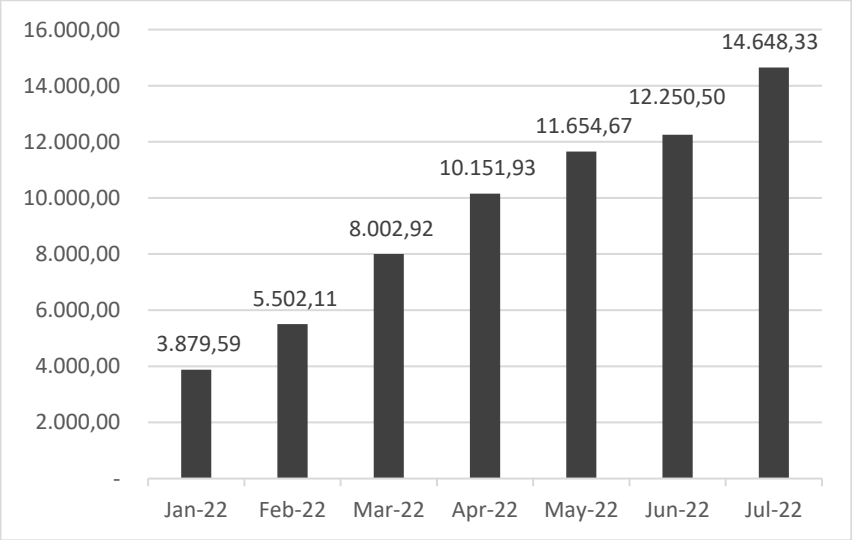

Figure 2. Outstanding P2P Lending Funded by Commercial Banks (billions in Rp)

The collaboration between P2P platforms and banks is demonstrated in Figure 2, illustrating a substantial growth in bank funds utilized for lending through P2P platforms. The funds increased significantly from IDR 3,879.59 billion to IDR 14,648.33 billion, indicating a remarkable surge of 277.57% between January and July 2022. These findings confirm the capability of peer-to-peer (P2P) platforms to act as intermediaries for facilitating the flow of bank funds, thereby supporting bank credit or credit distribution.

P2P lending can be used as a mediator to reach the unbanked community; hence, banks should increase cooperation with P2P platforms to be able to do credit channeling. In addition, banks and P2P platforms can socialize with the public about using P2P platforms, thereby increasing financial inclusion in areas that are less accessible to banks. The central and regional governments can develop regulations and disseminate information to people banks have not reached so they can recognize and utilize P2P platforms to gain access to funding.

CONCLUSIONS

This study provides empirical evidence regarding the mediating role of P2P lending between third-party banking funds and bank credit in provinces with fewer banking offices or less accessible to banks. The research method used is the ordinary least squared, using 33 provinces in Indonesia from January to July 2022. The main results of this study show that third-party funds in provinces with fewer banking branch offices do not affect bank credit. However, the results of this study through path analysis confirm that P2P lending is a mediator in the relationship between banking third-party funds and bank credit in provinces with fewer banking branch offices. The additional results of this study indicate that third-party funds have a significant and positive effect on bank credit in provinces with a more significant number of banking branch offices.

The main contribution of this research to the literature related to the banking intermediary function, especially in the context of intermediation theory, is the introduction of the P2P lending mediation

variable (FinTech) as an alternative variable to carry out the intermediary function in the relationship between banking saving and bank credit. This implication holds theoretical significance regarding the empirical findings of this research.

This research provides an alternative solution for banks, which is to use P2P platforms to serve areas that are less accessible to banks. Furthermore, P2P lending can capitalize on the opportunity to collaborate with existing banks in Indonesia to expand the P2P platform market and tap into banking customers in regions with limited banking branches. This has practical implications for both banking institutions and P2P platforms.

This research study significantly contributes to governmental bodies and relevant authorities by offering valuable insights for informed policy development and infrastructure planning decision-making. Specifically, it highlights the importance of facilitating peer-to-peer (P2P) platforms as intermediaries in disbursing loans and third-party funds to communities in underprivileged banking areas. Doing so aims to enhance financial inclusion and bridge the gap in financial services accessibility. This holds practical implications for the government, acting as the regulator and facilitator between P2P platforms and banking institutions.

The limitations of this research arise from the use of data at the provincial level; thus, it cannot provide more detailed insights at the company level. In addition, one province could not be used in data collection due to the unavailability of the necessary data. Therefore, this research recommends conducting further studies using primary data to delve deeper into the intermediation function of P2P platforms, particularly in provinces that have not been extensively researched.

By emphasizing the importance of studying smaller-scale banks, the suggestion highlights a specific area that could benefit from further research. It suggests that investigating the role of P2P lending mediation in smaller banks could contribute to a better understanding of how these institutions can effectively carry out their intermediation activities. Furthermore, future research can empirically examine the mediating or intermediary role of P2P platforms for rural banks in channeling their third-party funds. Due to their limited market size, rural banks require assistance to grow or remain viable in the financial sector.

REFERENCE

Abbasi, K., Alam, A., Brohi, N. A., Brohi, I. A., & Nasim, S. (2021). P2P lending Fintechs and SMEs' access to finance. *Economics Letters*, *204*, 109890. https://doi.org/10.1016/j.econlet.2021.109890

Admati, A., & Hellwig, M. (2013). *Bankers' New Clothes*. Princeton University Press.

Anagnostopoulos, I. (2018). Fintech and regtech: Impact on regulators and banks. *Journal of Economics and Business*, *100*, 7–25. https://doi.org/10.1016/j.jeconbus.2018.07.003

Berger, A. N., & Bouwman, C. H. S. (2009). Bank liquidity creation. *Review of Financial Studies*, *22*(9), 3779–3837. https://doi.org/10.1093/rfs/hhn104

Coetzee, J. (2018). Strategic implications of fintech on South African retail banks. *South African Journal of Economic and Management Sciences*, *21*(1). https://doi.org/10.4102/sajems.v21i1.2455

Hoechle, D. (2007). Robust standard errors for panel regressions with cross-sectional dependence. *Stata Journal*, *7*(3), 281–312. https://doi.org/10.1177/1536867x0700700301

Iman, N. (2019). Traditional banks against fintech startups : a field investigation of a regional bank in Indonesia. *Banks and Bank Systems*, *14*(3), 20–33. https://doi.org/10.21511/bbs.14(3).2019.03

Kohardinata, C., Soewarno, N., & Tjahjadi, B. (2020). Indonesian peer-to-peer lending (P2P) at entrant's disruptive trajectory. *Business: Theory and Practice*, *21*(1), 104–114. https://doi.org/10.3846/btp.2020.11171

Kohardinata, C., Suhardianto, N., & Tjahjadi, B. (2020). Peer-to-peer lending platform: From substitution to complementary for rural banks. *Business: Theory and Practice*, *21*(2), 713–722. https://doi.org/10.3846/btp.2020.12606

Lavryk, A. (2016). P2P lending as an alternative to bank lending in Ukraine. *Banks and Bank Systems*, *11*(4), 20–30. https://doi.org/10.21511/bbs.11(4).2016.02

Otoritas Jasa Keuangan. (2021). *Statistik Perbankan Indonesia* (Vol. 19, Issue 13).

Petrushenko, Y., Kozarezenko, L., Glinska-newes, A., & Tokarenko, M. (2018). The opportunities of engaging FinTech companies into the system of cross-border money transfers in Ukraine. *Investment Management and Financial Innovations*, *15*(4), 332–344. https://doi.org/10.21511/imfi.15(4).2018.27

Ramlall, I. (2018). FinTech and the Financial Stability Board. *Understanding Financial Stability*, 71–81. https://doi.org/doi.org/10.1108/978-1-78756-833-420181016

Sloboda, L., Dunas, N., & Limański, A. (2018). Contemporary challenges and risks of retail banking development in Ukraine. *Banks and Bank Systems*, *13*(1), 88–97. https://doi.org/10.21511/bbs.13(1).2018.09

Tang, H. (2019). Peer-to-Peer Lenders Versus Banks: Substitutes or Complements? *Review of Financial Studies*, *32*(5), 1900–1938. https://doi.org/10.1093/rfs/hhy137

Taujanskaite, K., & Milcius, E. (2022). Accelerated Growth of Peer-to-Peer Lending and Its Impact on the Consumer Credit Market : Evidence from Lithuania. *Economies*, *10*, 1–17. https://doi.org/doi.org/10.3390/economies10090210

Thakor, A. V. (2020). Fintech and banking : What do we know ? *Journal of Financial Intermediation*, *41*, 1–13. https://doi.org/10.1016/j.jfi.2019.100833

Werner, R. A. (2016). A lost century in economics: Three theories of banking and the conclusive evidence. *International Review of Financial Analysis*, *46*, 361–379. https://doi.org/10.1016/j.irfa.2015.08.014

Zalan, T., & Toufaily, E. (2017). The promise of fintech in emerging markets: Not as disruptive. *Contemporary Economics*, *11*(4), 415–430. https://doi.org/10.5709/ce.1897-9254.253

Zhang, Z., Hu, W., & Chang, T. (2019). Nonlinear effects of P2P lending on bank loans in a Panel Smooth Transition Regression model. *International Review of Economics and Finance*, *59*(August 2017), 468–473. https://doi.org/10.1016/j.iref.2018.10.010

Zhao, J., Li, X., Yu, C. H., Chen, S., & Lee, C. C. (2022). Riding the FinTech innovation wave: FinTech, patents, and bank performance. *Journal of International Money and Finance*, *122*, 102552. https://doi.org/10.1016/j.jimonfin.2021.102552