

P2P lending and banking credit for MSMEs and Non-MSMEs post COVID-19 pandemic: Does it matter?**Cliff Kohardinata^{a*}, Luky Patricia Widianingsih^a, Nicklaus Stanley^a, Yopy Junianto^a, Anastasia Filiana Ismawati^a and Evi Thelia Sari^b**^a*Universitas Ciputra Surabaya, Indonesia*^b*Sekolah Tinggi Ilmu Ekonomi Mahardhika, Indonesia***CHRONICLE***Article history:*

Received: July 5, 2023

Received in revised format:

August 21, 2023

Accepted: September 29, 2023

Available online:

September 29, 2023

*Keywords:**P2P**MSME credit**non-MSME credit**Post COVID-19***ABSTRACT**

This paper proposes an original view to determine the effect of P2P loans on MSME and non-MSME bank loans after the COVID-19 pandemic as a whole and then focuses on the island of Java (more developed areas) and outside Java (areas which are still undeveloped). The approach used in this study uses panel data regression from 33 provinces in Indonesia during Jan-Dec 2022 after the COVID-19 pandemic. The results of this study confirm that P2P lending is not a disrupter for bank credit, the details of the results are: (1) P2P lending has a significant positive effect on overall MSME banking credit, but has no significant effect on overall non-MSME banking credit; (2) P2P lending has no significant effect on MSME banking credit in Java, but has a significant positive effect on non-MSME banking credit in Java after the COVID-19 pandemic; (3) P2P lending has a significant positive effect on MSME banking credit outside Java after the COVID-19 pandemic, but has no significant effect on non-MSME banking credit in Java after the COVID-19 pandemic.

© 2024 by the authors; licensee Growing Science, Canada.

1. Introduction

The year 2022 was a very different era after the world globally faced the COVID-19 pandemic for 2 years, namely in 2020-2021. The COVID-19 pandemic and lockdown and social distancing policies have disrupted consumer habits in transactions, consumers learn to improvise and learn new habits in their daily routines (Sheth, 2020; Soluk et al., 2021). Various kinds of shocks occur including the COVID-19 pandemic can encourage people to adopt technology in unexpected ways, which in turn, can lead to long-term changes in society and the economy (Fu & Mishra, 2022). The post-COVID-19 era still leaves a variety of practical and research questions from various aspects of life including business, business competition, and company performance. From the perspective of the financial business sector, Fintech technology (Fintech) is a new innovation in finance largely driven by the industrial era 4.0, the availability of the internet and mobile communication has become indispensable in modern life and created an increasingly large market for digital-based financial services (Le, 2021). The COVID-19 pandemic accelerates digital orientation and Fintech adoption (Tut, 2023), and forces business owners to change behavior and adopt digital technology, including the optimization of non-cash transactions through Financial Technology (Fintech) to maintain business sustainability (Nugraha et al., 2022). The COVID-19 pandemic has indirectly promoted and changed people's behavior in the adoption of Fintech which has the potential to change people's behavior in utilizing Fintech after the COVID-19 pandemic has passed, even becoming long-term or permanent behavior in society.

One of the fast-growing Fintech-based financial service innovations in the peer-to-peer (P2P) platform, which facilitates the community to intermediate online between people who have funds and people who need funds (Kohardinata, Suhardianto, et al., 2020; Ramlall, 2018). The rapid growth of P2P lending in Indonesia after COVID-19 is reflected in

* Corresponding author.

E-mail address: ckohardinata@ciputra.ac.id (C. Kohardinata)

Figure 1, which shows that the accumulated P2P lending grew from 309.139 billion in January 2022 to 528.006 in December 2022, or a growth of 70.80% within a year. The phenomenon of behavioral changes during the COVID-19 pandemic and the rapid growth of P2P loans, especially after the COVID-19 pandemic raises the question of whether P2P loans have an impact on banks after the COVID-19 pandemic. Banks are facing a different chapter after the COVID-19 pandemic, several possibilities can occur with this shift, P2P platforms can be a complement or substitute for bank credit.

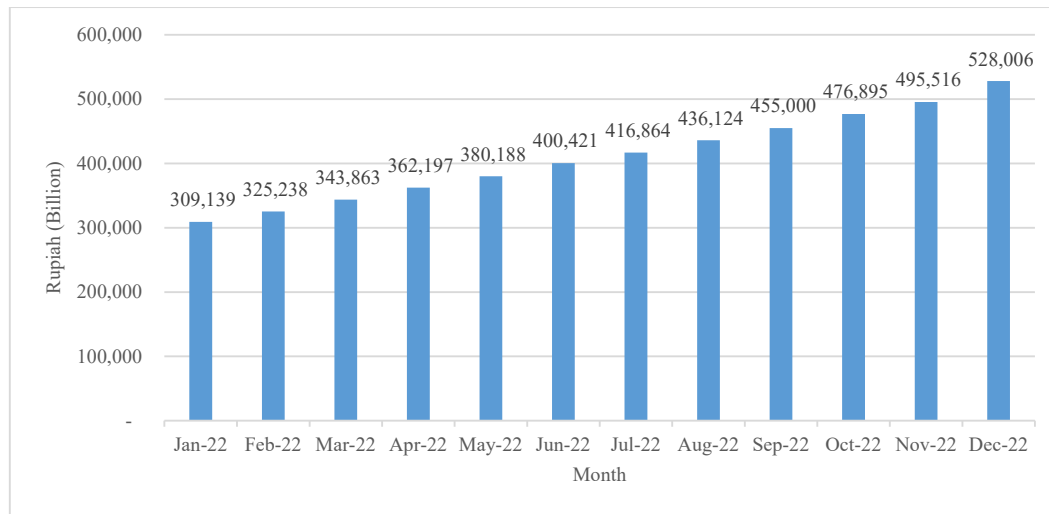


Fig. 1. Accumulated P2P Loan Disbursement in Indonesia from Jan-Dec 2022
Source: Otoritas Jasa Keuangan (2023)

Previous studies before the COVID-19 pandemic on the effect of P2P loans on bank credit showed mixed results. Research from Kohardinata, Soewarno, et al., (2020) shows that the growth of P2P loans has no significant effect on the growth of non-MSME banking credit, while the growth of P2P loans has a negative effect on MSME banking credit. Research from Zhang et al (2019) showed a dynamic relationship between P2P loans and bank credit, namely P2P loans have a positive effect on bank credit at the beginning of the regime when P2P loan balances are still small, then P2P loans have a negative effect on bank credit when P2P loan balances increase. Conversely, other studies state that the growth of P2P loans moves dynamically from substitution to complementary for credit growth from the People's Credit Bank, this movement to complementary occurs after the Credit Bank enters into a cooperation agreement with the P2P platform (Kohardinata, Suhardianto, et al., 2020). Previous studies on the effect of P2P lending on bank credit or the effect of P2P platforms on banks before the COVID-19 pandemic have not found uniform conclusions, let alone with the uncertain situation after COVID-19. Thus, there is a need for a more in-depth study to determine the effect of P2P loans on bank credit after COVID-19 from several banking aspects.

The banking aspects studied in this study consist of several aspects, namely: (1) MSME and non-MSME banking credit, which is due to differences in the focus of banks in lending, banks do not view MSME loans as the main banking market, even the central bank must require banks to distribute loans. Thus, there is a different potential for the influence of P2P loans on bank credit for the MSME and non-MSME sectors, (2) MSME and non-MSME banking credit in areas which have received more government attention (Java Island) and areas which have not received too much government attention (outside Java Island). The reason for using this second aspect is that 56.48% percent of GDP is still dominated by the economy in Java Island consisting of 6 provinces, while the remaining 43.52% is dominated by the economy outside Java Island consisting of 28 provinces. Thus, the effect of the P2P platform on MSME and non-MSME bank loans may be different if separating the test based on the context of the government's development focus, namely Java compared to islands outside Java.

This research is a development of previous research from Kohardinata, Soewarno, et al., (2020). The difference between previous research and the current one is mainly in the conditions before and after COVID-19. Previous research was conducted before COVID-19 while the current research was conducted after COVID-19, so the financial landscape and competition between P2P platforms and banks may change as well. In addition, this study uses a different approach, namely the balance of P2P loan disbursements and bank credit, while previous studies used P2P loan growth and bank credit growth. The use of balances is more appropriate at this time because P2P lending can be seen not as a platform which is still in its infancy but has been quite developed and widely accepted by the public for more than 5 years which developed from around 2018 to 2022. The results of the literature study conducted by researchers, there are still no studies which review from the point of view of the effect of P2P loans on MSME and non-MSME banking credit after COVID-19 as a whole and involve a separation between provinces which have received more government attention (in the Java Islands) and provinces which have not received too much government attention (outside the Java Islands).

2. Literature Review

This literature review section discusses the literature used to understand the effect of P2P loans on bank credit.

2.1. Disruptive Innovation Theory

The first study relates to the disruptive innovation theory reflected in Fig. 2; the graph juxtaposes the product performance trajectory with the customer demand trajectory. Incumbent companies provide higher quality products or services to satisfy the high-end market beyond the needs of customers in the low-end mainstream markets. This position provides an opening for new entrants to gain a foothold in the less profitable segment which is ignored by the incumbent company. Furthermore, the new entrant improves its product performance to be able to move up to markets which provide higher profitability and challenge the dominance of incumbent companies (Christensen et al., 2015). The main thing to note is that the term disruptive innovation is not just a condition which indicates the collapse of companies due to the shock of incoming companies (Christensen et al., 2015). Disruption is a process so that disruptive innovation is not appropriate if it describes only products or services, but disruptive innovation is a gradual evolution of products or services over time (Christensen, 1997; Christensen et al., 2015).

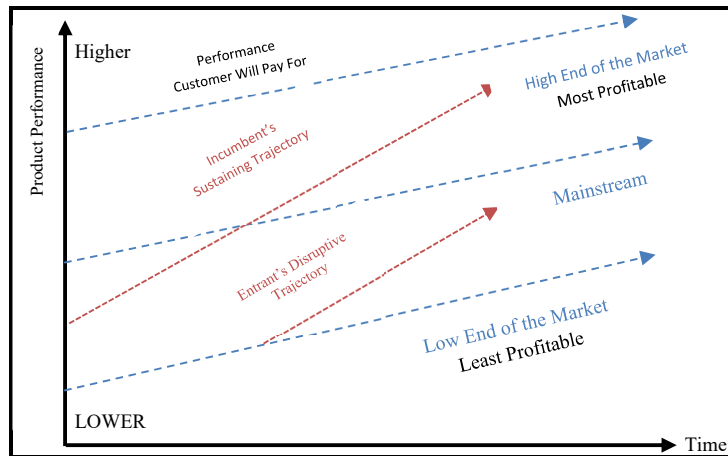


Fig. 2. The Disruptive Innovation
Adapted from Christensen et al. (2015) drawn by authors

The initial disruptive innovation diagram in Figure 2 shows performance trajectories which have the same slope, but some experts have suggested that the rate of improvement of each trajectory can vary significantly according to the industry (Christensen et al., 2015, 2018). For example, Figure 3 shows that the improvement trajectory appears almost flat over time, and disruption appears to be completely absent. This reconceptualization of classic disruptive innovation theory suggests that disruption does not occur in all areas, nor does it occur to the same extent across industries (Christensen et al., 2018).

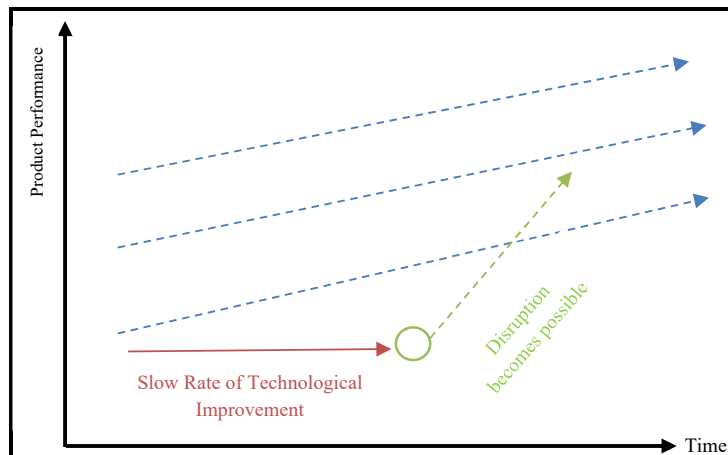


Fig. 3. Kinks in improvement trajectories
Source: Adopted from Christensen et al. (2018) drawn by authors

Based on the explanation of the classic disruptive innovation theory and the reconceptualization of disruptive innovation theory. Thus, even though the P2P platform has existed for several years and is growing rapidly, it is not necessarily able to penetrate the main market or the high-end banking market as an incumbent company. Banking has always been a technology intensive industry (Das, 2017), the banking sector is accustomed to digital changes and relies on digital technology to be able to compete from time to time, such as: the evolution of banking from ATM machines, internet banking to mobile banking, and so on. Thus, the banking sector can be seen as a type of industry which is not easy to be challenged and defeated by P2P platforms, making it possible for P2P platforms not to become a disrupter or complement in the financial industry.

2.2. Consumer Theory

Consumer theory states that the product or service of an incumbent firm can also be a complement to the incumbent firm or vice versa as a substitute. An incoming company can be a complement to the incumbent company when the products or services of the incoming company can be used together with the products or services of the incumbent company (Aaker & Keller, 1990; Levin & Milgrom, 2004). On the flip side, a product or service from an incumbent firm can be a substitute if the product or service can replace the product of the incumbent firm (Aaker & Keller, 1990; Phan et al., 2019). A product or service can be substituted through new goods or price changes (Lancaster, 1966). Substitute products tend to have common applications and contexts of use so that new products can replace other products in use and fulfill the same needs (Aaker & Keller, 1990).

P2P platforms should be viewed not just as competitors, P2P platforms can be integrated together with products or services offered by banks. In addition, P2P platforms also have the potential to establish cooperation agreements with banks to collaborate and share facilities and technology to be able to expand market share.

2.3. P2P and Banking Platforms

Based on the two theories which have been presented, namely: disruptive innovation theory and consumer theory, there are various possibilities which can occur in the relationship between P2P platforms and banks. The most likely relationship is P2P lending as a substitute or as a complement to banking. Thus, the next study discusses the P2P platforms as a substitute for banks, as well as the P2P platform as a complementary for banks.

2.3.1. P2P Platforms as Substitutes for Banking

The disruptive innovation theory shows that P2P lending can enter the competition through markets which are not the main market of banks or low-end markets. The MSME credit market is one of the small markets (low end) of banking, even the central bank must require banks to be willing to increase the ratio of lending to the MSME sector by 20% of total credit. P2P platforms have the opportunity to enter the low-end credit market in the MSME sector, so that the growth of P2P loans can have a negative effect or become a substitute for bank MSME loans (Kohardinata, Soewarno, et al., 2020). P2P lending is a substitute for bank credit to serve infra-marginal bank borrowers (Tang, 2019).

Research from (Zhang et al., 2019) showed dynamic results, namely P2P loans have a positive influence on domestic bank credit balances when P2P loan balances are still small. Conversely, P2P loans have a negative effect on domestic bank credit when the balance of P2P loans is getting bigger. In contrast, research by Kohardinata, Suhardianto, et al., (2020) showed the opposite direction, namely: P2P loans are substitutes for Rural Bank loans in the initial phase, but P2P loans are complementary in the next phase after the collaboration agreement between P2P platform management and Rural Banks.

Based on the reconceptualization of the disruptive innovation theory presented earlier, the researcher is of the view that P2P platforms do not easily become a substitute for bank credit. Fintech-based start-up companies still have a long way to go before the fintech market reaches maturity, and many hurdles must be overcome to protect investors without killing innovation. Fintech is also likely to continue to evolve and new innovations will replace or enhance existing technologies (Bollaert et al., 2021). P2P platforms still need more time to enter the mainstream banking market, given that the banking industry is also an industry which is fluent and accustomed to adapting to technology to maintain and improve competitive advantage.

2.3.2. P2P Platform as a Complement to Banking

Research from Zhang et al., (2019) presented earlier showed that P2P lending positively affects domestic bank credit in the early phase when P2P loan balances are still small. Referring to the conceptualization of disruptive innovation theory, the upward trajectory of P2P platforms may be flat over time or show no disruption, given that the banking industry is also technology intensive. Thus, if referring to research from Zhang et al., (2019), P2P lending is likely to have a positive effect on bank credit, or in other words, P2P platforms are a complement to banks. P2P platforms can complement banks by

providing small loans or collaborating with banks in serving the funding needs of the community (Kohardinata, Suhardianto, et al., 2020; Tang, 2019).

P2P platforms can fill the credit gap in areas which lack bank offices and local economic conditions are more challenging, the presence of P2P platforms plays an important role in increasing the availability of funding for people (Jagtiani & Lemieux, 2018). P2P lending is a useful complement to traditional financial institutions to utilize idle public funds (Jiang et al., 2018). P2P platforms can cooperate with banks in developing the banking market and utilize idle public funds and serve areas which cannot be reached by banks.

Based on reviews of previous studies, it is not easy to propose a hypothesis because there are various logical arguments to view P2P platforms as substitutes or complements for banks. Researchers attempt to draw conclusions from several previous studies to draw a hypothesis conclusion, namely: (1) Reconceptualization of disruptive innovation theory becomes the basis for this study so that it can be concluded that P2P loans have not become substitutes or disrupters for the main banking market or still need time to develop technology in the technology-intensive banking industry, so P2P loans complement the main banking market (non-MSME markets and markets in developed areas (Java Island)); (2) P2P loans can also complement small loans (MSMEs), areas which have not been reached by banks or have not developed (outside Java island). Thus, the initial standpoint proposed in the study is that P2P loans have a positive effect on bank credit, so the hypothesis in this study is as follows:

H_{1a}: *P2P lending has a significant positive effect on MSME banking credit after the COVID-19 pandemic.*

H_{1b}: *P2P lending has a significant positive effect on non-MSME banking credit after the COVID-19 pandemic.*

H_{2a}: *P2P lending has a significant positive effect on MSME banking credit after the COVID-19 pandemic in Java.*

H_{2b}: *P2P lending has a significant positive effect on non-MSME banking credit after the COVID-19 pandemic in Java.*

H_{3a}: *P2P lending has a significant positive effect on MSME banking credit after the COVID-19 pandemic outside Java.*

H_{3b}: *P2P lending has a significant positive effect on non-MSME banking credit after the COVID-19 pandemic outside Java.*

3. Research Method

This study used cross section and time series data consisting of 33 provinces in Indonesia from January to December 2022, thus this study used a panel data regression approach. The research model used in this study is as follows:

$$MSME_{it} = \alpha + \beta_1 P2P_{it} + \beta_2 SAV_{it} + \beta_2 BO_{it} + \epsilon_{it} \quad (1)$$

$$Non\ MSME_{it} = \alpha + \beta_1 P2P_{it} + \beta_2 SAV_{it} + \beta_2 BO_{it} + \epsilon_{it} \quad (2)$$

$$MSME-J_{it} = \alpha + \beta_1 P2P_{it} + \beta_2 SAV_{it} + \beta_2 BO_{it} + \epsilon_{it} \quad (3)$$

$$Non\ MSME-J_{it} = \alpha + \beta_1 P2P_{it} + \beta_2 SAV_{it} + \beta_2 BO_{it} + \epsilon_{it} \quad (4)$$

$$MSME-NJ_{it} = \alpha + \beta_1 P2P_{it} + \beta_2 SAV_{it} + \beta_2 BO_{it} + \epsilon_{it} \quad (5)$$

$$Non\ MSME-NJ_{it} = \alpha + \beta_1 P2P_{it} + \beta_2 SAV_{it} + \beta_2 BO_{it} + \epsilon_{it} \quad (6)$$

Table 1 is a detailed explanation of the variables used in this study. For information, the island of Java consists of several provinces, namely: “DKI Jakarta, West Java, Banten, East Java, Central Java, and D.I Yogyakarta”. The provinces outside Java Island consist of: “Bengkulu, Jambi, Aceh, North Sumatra, West Sumatra, Riau, Riau Islands, South Sumatra, 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”.

Table 1
Dependent, Independent, and Control Variable

Variable	Measurement
Dependent Variable	
MSME	Bank credits for the MSME debtors in each province
Non-MSME	Bank credits for non MSME debtors in each province
MSME-Jit	Bank credits for the MSME debtors in each province on Java Island
Non MSME-Jit	Bank credits for the non MSME debtors in each province on Java Island
MSME-NJit	Bank credits for the MSME debtors in each province on non-Java Island
Non MSME-NJit	Bank credits for the non MSME debtors in each province on non-Java Island
Independent Variable	
P2P	Peer-to-peer Loans (P2P) are in each province
Control Variable	
SAV	Bank Saving (current account, saving account, deposit account) in each province
BO	Total Bank Office in each province
Number of province (i)	
Number of month (t)	

The test in this study consists of several parts which are reflected in the research models no 1-3 which have been presented previously. Model 1a reflects the test of the effect of P2 loans on MSME banking credit by involving the control variables

of bank savings and total bank office. Model 1b reflects the test by using the independent variable P2P loans, as well as non-MSME banking credit as the dependent variable, then the control variables used are bank savings and total bank office. Model 2a and 2b are repetitions of models 1a and 1b, but in models 2a, 2b involve provinces which have been of concern to the government or are more developed, namely Java Island. Models 3a and 3b are repetitions of model 1a and 1b, but in models 3a, 3b involve provinces outside Java with the focus of attention of which provinces outside Java have not developed rapidly. Panel data regression consists of 3 types, namely: common effect or pooled ordinary least squares, fixed effect, and random effect. The selection of a more suitable model between random effect and fixed effect models uses the F-test and the Hausman test (Dang, 2019). Lagrange Multiplier is used to select the appropriate model between common effect and random effect (Shawtari, 2018).

4. Research Result

4.1. Descriptive Statistics

Table 2 is the result of descriptive statistics of the variables used for testing without separating the provinces in Java and provinces outside Java. The number of observations used is 396 observations (N=396) using 33 provinces (n=33) for 12 months (T=12).

Table 2
Descriptive Statistics for overall testing

	Variable	Mean	Std. Dev.	Min	Max
MSME	overall	39,048.83	50,673.69	3,534.72	199,242.60
	between		51,352.46	3,707.72	190,886.60
	within		2,045.85	26,021.70	48,763.67
Non- MSME	overall	141,813.00	477,762.40	2,617.36	2,985,258.00
	between		483,877.50	2,789.12	2,799,478.00
	within		25,292.13	-105,692.40	327,593.10
P2P	overall	569.00	1,212.56	10.72	6,552.89
	between		1,218.82	15.71	5,055.98
	within		161.73	- 591.07	2,065.91
SAV	overall	231,012.90	685,191.10	5,703.83	4,373,923.00
	between		694,336.90	6,014.00	3,991,774.00
	within		28,439.66	80,530.76	613,161.50
BO	overall	106.88	114.64	16.00	462.00
	between		116.25	16.33	456.42
	within		2.09	91.71	112.71

Table 3 is the result of descriptive statistics of the research variables for tests which are specialized in the island of Java only. Table 3 shows that there are 6 (n=6) provinces on the island of Java for 12 months (T=12) so that the total observations are 72 observations (N=72).

Table 3
Descriptive Statistics for tests in Java Island

	Variable	Mean	Std. Dev.	Min	Max
MSME	overall	124,272.50	64,918.18	20,204.55	199,242.60
	between		70,453.06	21,263.34	190,886.60
	within		4,444.06	111,245.40	133,987.40
Non- MSME	overall	629,666.80	985,093.40	22,385.26	2,985,258.00
	between		1,069,634.00	23,071.25	2,799,478.00
	within		59,583.46	382,161.40	815,446.90
P2P	overall	2,547.10	1,810.69	168.92	6,552.89
	between		1,926.31	248.68	5,055.98
	within		377.92	1,387.03	4,044.01
SAV	overall	998,838.30	1,365,607.00	74,491.18	4,373,923.00
	between		1,483,752.00	76,291.30	3,991,774.00
	within		66,665.47	848,356.10	1,380,987.00
BO	overall	291.56	154.39	59.00	462.00
	between		167.89	60.67	456.42
	within		4.15	276.39	297.39

Table 4 provides descriptive statistics for model testing in provinces outside Java. Table 4 shows that there are a total of 324 observations (N=324) consisting of 27 provinces (n=27) for 12 months (T=12).

Table 4
Descriptive Statistics for testing outside Java Island

	Variabel	Mean	Std. Dev.	Min	Max
MSME	overall	20110.22	15331.09	3534.72	70370.48
	between		15573.2	3707.716	66771.6
	within		881.6167	16353.06	23709.1
Non MSME	overall	33401.03	31392.41	2617.36	164735.8
	between		31910.14	2789.123	156252.3
	within		1379.718	27214.97	41884.59
P2P	overall	129.4215	106.3856	10.72	536.63
	between		105.3713	15.71167	425.2508
	within		24.34971	12.36062	250.414
SAV	overall	60385.07	59920.26	5703.83	307461.8
	between		60863.81	6013.999	299852
	within		3491.418	44181.91	80824.8
BO	overall	65.83642	39.25555	16	203
	between		39.92106	16.33333	200.3333
	within		1.257485	59.08642	69.50309

4.2. Research Model Testing Results

The discussion begins with determining the appropriate for panel data regression between common effect, fixed effect, and random effect. After determining the appropriate model, the next discussion is about the assumptions which need to be met in testing the model.

Table 5.1a and 5.1b are tests of the effect of P2P loans on MSME and non-MSME banking credit after the COVID-19 pandemic. Table 5.1a and 5.1b show that the results of the Chow and Hausman tests are 0.0000 so it can be concluded that the appropriate model to use is fixed effect. The variance inflation factor (VIF) is 4.53 or below 10 so it can be concluded that there are no symptoms of multicollinearity. Table 5.1a and 5.1b in the heteroscedasticity test section and Wooldridge test section to test autocorrelation show significant values, indicating the presence of symptoms of heteroscedasticity and autocorrelation problems. Thus, in an effort to overcome the symptoms of heteroscedasticity and autocorrelation problem, it is necessary to involve clustering standard errors in panel data regression testing (Hoechle, 2007).

Table 5
Research Model Test and Classic Assumption Test

	Overall (1)		Java (2)		Outside Java (3)	
	MSME (a)	Non MSME (b)	MSME (a)	Non MSME (b)	MSME (a)	Non MSME (b)
Chow Test (Prob > F)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hausman Test	0.0000	0.0000	0.0000	0.0917	0.0000	0.0000
Breusch Pagan Lagrangian multiplier test	-	-	-	0.0000	-	-
Appropriate Model	Fixed effect	Fixed effect	Fixed effect	Random effect	Fixed effect	Fixed effect
VIF	4.53		6.70		12.22	
Modified Wald test (Heteroscedasticity test)	0.0000	0.0000	0.0000	-	0.0000	0.0000
Wooldridge test (Autocorrelation test)	0.0060	0.0000	0.0692	-	0.0053	0.0003

Table 5.2a and 5.2b are tests of the effect of P2P loans on MSME and non-MSME banking credit after the COVID-19 pandemic in provinces in Java. The results of the Chow test and Hausman test in Table 5.2a show a significant value of 0.0000 so it can be concluded that the more appropriate model to use is the fixed effect panel data regression. The VIF value is 6.70 so it can be concluded that there are no symptoms of multicollinearity. Table 5.2a in the heteroscedasticity test and autocorrelation test section shows a significance value of 0.0000 and 0.0692, so it can be concluded that there are symptoms of heteroscedasticity problems but no symptoms of autocorrelation problems. Thus, testing using robust standard errors can be used to resolve symptoms of heteroscedasticity problems (Hoechle, 2007). Table 5.2b shows significant results in the Chow test of 0.0000 while the results of the Hausman test show an insignificant value 0.0917 so that the random effect model is more appropriate than the fixed effect model. Furthermore, there is a need for further testing of the Breusch Pagan Lagrangian multiplier test to compare the most suitable model between random effects and pooled ordinary least squares. Table 5.2b in the Breusch Pagan Lagrangian multiplier test section shows a significant value of 0.0000 so that the random effect is a more suitable model used in this test. With the selection of random effect in panel data regression testing, there is no need for heteroscedasticity and autocorrelation testing.

Table 5.3a and 5.3b are tests of the effect of P2P loans on MSME and non-MSME banking credit after the COVID-19 pandemic outside Java. The results of the Chow and Hausman tests show a significant value of 0.0000 so that the appropriate model to use is fixed effect. The variance inflation factor (VIF) is 12.22 so it can be concluded that there are symptoms of multicollinearity, but the symptoms of multicollinearity are not perfect multicollinearity and do not change the main results

of this study. Table 5.3a and 5.3b in the heteroscedasticity test section and Wooldridge test section (autocorrelation test) show significant values which indicate the symptoms of heteroscedasticity and autocorrelation problems. Thus, panel data regression testing needs to involve clustering standard errors to resolve the symptoms of heteroscedasticity and autocorrelation problems (Hoechle, 2007).

4.3. Hypothesis Testing Results and Discussion

This section discusses the results of hypothesis testing of the research models which have been presented in the previous sections.

4.3.1. The Effect of P2P Loans on MSME and Non-MSME Banking Credit After the COVID-19 Pandemic

The results of the F test (Prob>F) in Table 6.1a show a significant value of 0.0000 so it can be concluded that the model used in this study can explain the dependent variable on MSME banking credit after the COVID-19 pandemic. Table 6.1a shows the results that P2P loans (P2P) have a significant positive effect on MSME banking credit (MSME) after the COVID-19 pandemic with a coefficient value of 2.934. The control variable banking saving has no significant effect on MSME banking loans, while the number of banking offices (BO) has a significant negative effect on MSME banking loans with a coefficient of -502.0. R-squared shows the ability to explain this research model by 93.06%. Based on the hypothesis testing results which have been presented, it can be concluded that hypothesis 1a has been proven.

The significant results in the F Test (Prob>F) listed in Table 6.1b indicate that the research model can explain the dependent variable of non-MSME banking credit after the COVID-19 pandemic. Table 6.1b shows that P2P loans have no significant effect on non-MSME banking credit after the COVID-19 pandemic. The control variable banking saving has a significant positive effect on non-MSME banking loans after the COVID-19 pandemic with a coefficient of 0.700, and the number of banking offices has no significant effect on non-MSME banking loans. The model used in this study can explain the dependent variable by 92.07 percent (R-squared = 92.07%). In the explanation and testing which has been done, it can be concluded that the proposed hypothesis 1b is not proven.

Bank management often does not pay much attention to the MSME sector's credit market share because it is not the main market share of banks, even the government must make regulations to require banks to channel MSME loans at a minimum of 20% of total loans. MSME debtors are seen as having a higher risk of information asymmetry as seen from banking management decisions in lending, so banks are worried about channeling funding to small and medium enterprise-scale debtors (Cassar et al., 2015; Kolari et al., 1996; Wu & Hua, 2018). This is in line with the results of this study, which show that savings from banks tend not to significantly support bank lending to the MSME sector. Meanwhile, the number of banking offices, which should encourage the development of MSME credit and as a means of developing public financial literacy, shows the opposite side, namely a negative effect on bank credit for the MSME sector.

Table 6
Hypothesis Testing Results

Variables	Overall (1)	
	MSME (a)	Non MSME (b)
P2P	2.934** (1.077)	34.77 (22.27)
SAV	0.00248 (0.00324)	0.700*** (0.0138)
BO	-502.0*** (69.66)	1,480 (1,270)
Constant	90,460*** (7,102)	-197,883 (151,182)
Prob>F	0.0000	0.0000
R-squared	0.9306	0.9207

*** p<0.01, ** p<0.05, * p<0.1

P2P platform technology can be a solution for the MSME sector to obtain funding post-COVID-19. The traditional “brick and mortar” model in banking has been replaced with an online model, in which information technology plays a crucial role (Murinde et al., 2022). P2P platforms have certain advantages in utilizing big data, machine learning, and artificial intelligence algorithms to assess MSME credit risk more accurately so that MSMEs can qualify for loans and possibly obtain lower interest rates (Abbasi et al., 2021; Jagtiani & John, 2018). P2P platforms and banks can collaborate to channel funding to the MSME sector which does not qualify under traditional banking regulations. Therefore, the Fintech approach used by P2P platforms to evaluate prospective MSME borrowers can complement the banking sector to channel idle funds to MSMEs and fulfill government regulations. Banks optimize the distribution of savings in the non-MSME credit market so that the P2P platform is not easy or has not been able to become a disrupter for the non-MSME credit market. In addition, the P2P platform is still in the growth stage, so it has not been able to serve the entire non-MSME market. This is in line with Kohardinata, Soewarno, et al., (2020) research conducted before the COVID-19 pandemic, which shows that P2P loan growth does not affect non-MSME credit growth. The lack of effect of P2P lending in the situation before and after the

COVID-19 pandemic is in line with the reconceptualization of disruptive innovation theory which shows that the rate of increase of each disruptive innovation trajectory can vary according to the industry (Christensen et al., 2015, 2018). P2P platforms allow serving the niche market of non-MSME banking credit but have not been able to contribute greatly as credit channeling to the broader non-MSME banking credit market which may be limited by the resources and digital literacy of the community.

4.3.2. The Effect of P2P Lending on MSME and Non-MSME Banking Credit After the COVID-19 Pandemic in Java

The next presentation focuses on Table 7.1a, The F test (prob>F) shows a significant value of 0.0085 which indicates that the research model can explain the MSME banking credit dependent variable after the COVID-19 pandemic on the island of Java. The effect of P2P loans on MSME banking credit after the COVID-19 pandemic on the island of Java has no significant effect at the 5% significance level but has a positive significant effect at the 10% significance level. The banking saving variable has no significant effect on MSME banking loans after the COVID-19 pandemic on the island of Java, while the number of banking offices has a significant negative effect on MSME banking loans after the COVID-19 pandemic on the island of Java with a coefficient value of -558.2. R-squared is 0.8717 which indicates the ability of the model to be able to explain the dependent variable by 87.17 percent. The results of testing the research model can be concluded that hypothesis 2a is not proven significant.

The F test value (prob>F) in Table 7.1b shows that the research model can explain non-MSME banking credit on the island of Java after the COVID-19 pandemic with an R squared of 0.9979. The test results show that P2P loans and bank savings have a significant positive effect on non-MSME banking loans on the island of Java after the COVID-19 pandemic, with a P2P loan coefficient of 26.41 and a saving coefficient of 0.725. The number of banking offices has a significant negative effect on non-MSME banking loans on the island of Java after the COVID-19 pandemic with a coefficient of -452.3. Based on the results, it can be concluded that hypothesis 2b is accepted or proven that P2P loans have a significant positive effect on non-MSME banking loans after the COVID-19 pandemic in Java.

Table 7
Hypothesis Testing Results with Separation Between Java Island and Outside Java Island

Variables	Java Island (1)		Outside Java Island (2)	
	MSME (a)	Non MSME (b)	MSME (a)	Non MSME (b)
P2P	2.795* (1.134)	26.41*** (9.756)	7.023*** (1.864)	-0.258 (3.280)
SAV	0.00150 (0.00283)	0.725*** (0.0161)	0.0699** (0.0302)	0.0854*** (0.0178)
BO	-558.2*** (94.83)	-452.3*** (149.5)	-278.4** (100.9)	-223.8** (99.74)
Constant	278,393*** (25,477)	-29,519 (37,507)	33,308*** (7,282)	43,012*** (6,530)
Prob>F	0.0085	0.0000	0.0005	0.0000
R-squared	0.8717	0.9979	0.6125	0.6854

*** p<0.01, ** p<0.05, * p<0.1

In the condition in which the region has developed and become the government's attention in development (Java Island), the MSME credit market is not a concern or the main market for banks in lending. This phenomenon is in line with the research results which show that saving banks on the island of Java do not play a significant role in the MSME sector. Unfortunately, the P2P platform is expected to be an agent to encourage bank credit to MSMEs, but the reality is that the P2P platform has no significant effect on MSME bank credit on the island of Java. A possible reason for this result is that Java is a developed region or the main focus of development in Indonesia. Thus, non-MSMEs dominate business movements on the island of Java, so that naturally lending by P2P platforms follows the main needs of the market, namely non-MSME credit. Another argument is that with limited resources from the P2P platform or lender, it certainly has a priority scale in lending, namely non-MSME loans as a priority scale. In reconceptualizing the theory of disruptive innovation and consumer theory, it can be concluded that the P2P platform is neither a disrupter nor a substitute for the banking MSME credit market.

In the condition that the region has developed and become the government's attention in development (Java Island), the P2P platform complements the main banking market or the non-MSME banking credit market. The proportion of P2P lending in Fig. 4 reflects the reversal of the proportion of loans, from the dominant proportion of MSMEs in Jan 2022 of 62.26%, changing to the dominant proportion of non-MSMEs from Feb 2022 to Dec 2022 in the range of 62.05% to 65.55%. The researcher believes that the P2P platform has become a credit channel for non-MSME bank loans in developed areas.

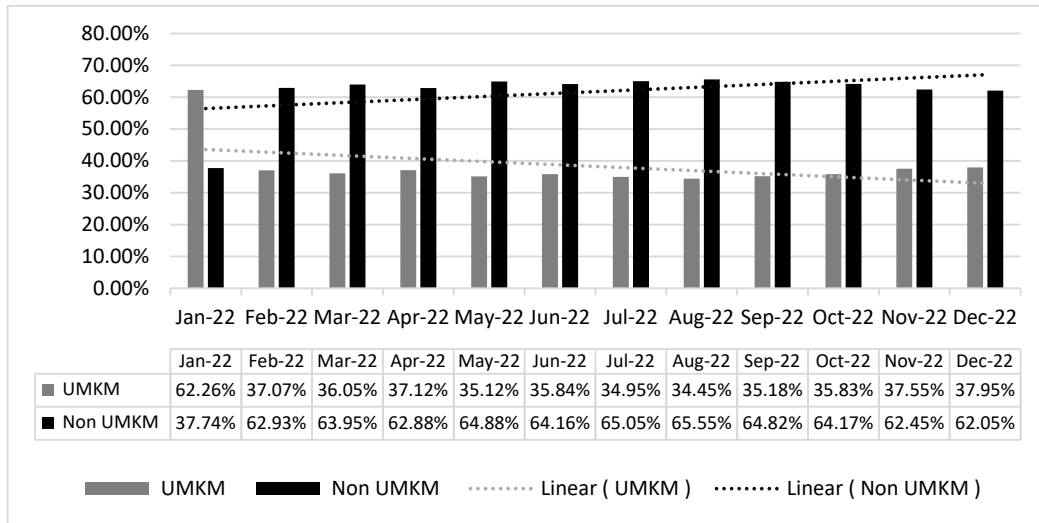


Fig. 4. The proportion of P2P lending for MSME and Non-MSME
Source: Otoritas Jasa Keuangan, (2023)

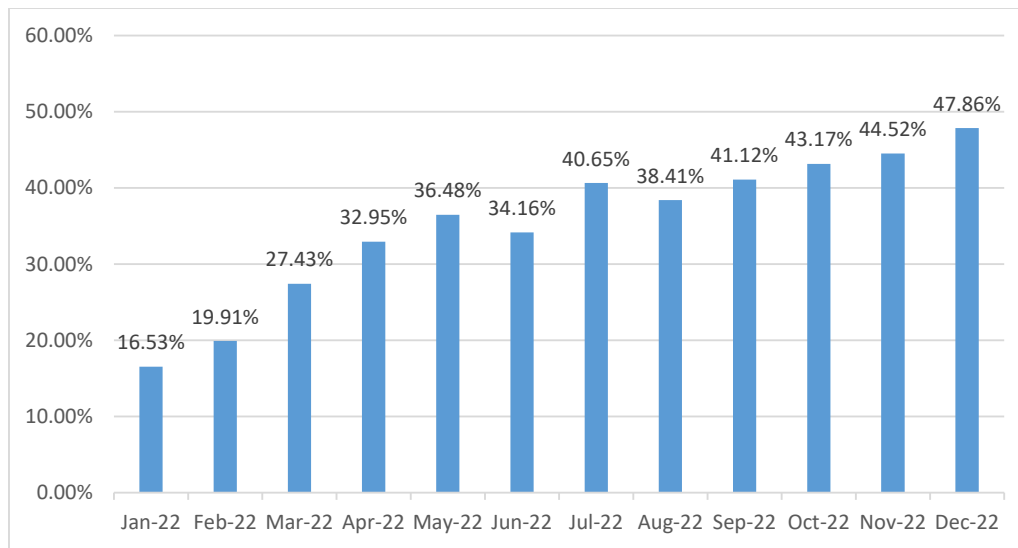


Fig. 5. Proportion of P2P Lenders from Commercial Banks
Source: Otoritas Jasa Keuangan, (2023)

In line with Fig. 5, which reflects that the trend of banks as P2P lenders has increased from January 2022 by 16.53% to 47.86% in December 2022, and the proportion in December 2022 is the highest proportion throughout 2022 so it has the potential to continue to grow in the future. The large market share of non-MSME loans on the island of Java also causes bank savings to be optimized to support non-MSME banking loans as well. It can be concluded that P2P loans are not a disrupter or substitute for non-MSME banking loans, instead, P2P loans are complementary to non-MSME banking loans in developed areas.

4.3.3. The Effect of P2P Lending on MSME and Non-MSME Banking Loans After the COVID-19 Pandemic Outside Java

Table 7.2a shows the test of the effect of P2P loans on MSME banking credit after the COVID-19 pandemic outside Java. The F test (Prob>F) is significant at 0.0005. P2P loans and banking savings have a significant positive effect on MSME banking loans outside Java with coefficients of 7.023 and 0.0699. The number of banking offices has a significant negative effect on MSME banking loans after the COVID-19 pandemic outside Java with a coefficient value of -278.4. The R-squared is 0.428 which reflects that the research model can explain the dependent variable by 42.8%. Thus, it can be concluded that the results show that hypothesis 3a is accepted.

Table 7.2b is a test of the effect of P2P loans on post-COVID-19 pandemic non-MSME banking credit outside Java. The F test (Prob>F) has a significant value of 0.000, which indicates the research model can explain the dependent variable of post-COVID-19 pandemic non-MSME banking credit outside Java, and this research model can explain the dependent variable by 12.6 percent (R-squared = 0.126). P2P loans in Table 7.2b show that P2P loans do not have a significant effect

on post-COVID-19 pandemic non-MSME banking loans outside Java. The control variable banking saving shows a positive significant effect on post-COVID-19 pandemic non-MSME banking loans outside Java, while the control variable number of banking offices has a negative significant effect on post-COVID-19 pandemic non-MSME banking loans outside Java. The results of testing the research model show that hypothesis 3b is not proven.

The role of P2P platforms is important for MSME debtors outside Java or areas that have not been the focus of development. A possible argument is that MSME players alone do not easily get access from banks, especially with limited access because the area has not yet developed. The P2P platform is an alternative solution for MSME debtors through the use of financial technology owned by the P2P platform in assessing prospective debtors and has a reach that is not limited by bricks and mortar. The P2P platform is not a disrupter for MSME banking credit outside Java, but rather as a complement in supporting the expansion of MSME banking lending.

The relatively smaller banking credit market outside Java allows savings from banks to be sufficient to support the development of non-MSME credit outside Java, or the non-MSME sector allows the privilege to get access from banks because it is considered to have less information asymmetry. Thus, the presence of P2P platforms does not have a significant impact on the development of non-MSME loans. The P2P platform is not a disrupter in this market, but it is not a significant complement to the development of non-MSME banking loans outside Java.

5. Conclusion

In this paper, the author presents an empirical evaluation of the effect of P2P loans on MSME and non-MSME bank loans after the COVID-19 pandemic as a whole, then focuses on the island of Java (more developed areas) and outside Java (areas which are still undeveloped). The test in this paper uses panel data regression from 33 provinces in Indonesia during Jan-Dec 2022. The results confirm that P2P lending is not a disrupter for bank credit in all research areas, the details of the results are as follows: (1) P2P lending has a significant positive effect on overall MSME banking credit after the COVID-19 pandemic, but has no significant effect on overall non-MSME banking credit after the COVID-19 pandemic; (2) P2P lending has no significant effect on MSME banking credit in Java after the COVID-19 pandemic, but has a significant positive effect on non-MSME banking credit in Java after the COVID-19 pandemic; (3) P2P lending has a significant positive effect on MSME banking credit outside Java after the COVID-19 pandemic, but has no significant effect on non-MSME banking credit in Java after the COVID-19 pandemic.

The results of this study provide implications for the government to facilitate and encourage the use of P2P platforms for MSME lending, especially in undeveloped areas to help access funding and develop MSME credit, especially outside Java. P2P platforms and banks should collaborate to increase the distribution of bank loans, especially in areas that are difficult to reach or for potential debtors who are difficult to obtain financial access from banks. In addition, the P2P platform should develop its market as a friend for MSMEs, especially in Java Island, it should maintain the proportion between MSME and non-MSME lending to be dominated by the MSME sector again. Banks can facilitate customers or prospective debtors who do not meet banking requirements to be able to utilize the P2P platform which is a partner of the bank.

Future research can dig deeper qualitatively regarding the results of this study to be able to obtain expert sources to be able to explain in detail the phenomena that occur from the results of this study. In addition, further research can examine specifically not only MSME credit as a whole but can separate the dependent variables specifically micro business credit, small business credit, and medium business credit.

References

- Aaker, D., & Keller, K. L. (1990). Consumer Evaluations of Brand Extensions. *Journal of Marketing*, 54(1), 27. <https://doi.org/10.2307/1252171>
- 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>
- Bollaert, H., Lopez-de-Silanes, F., & Schwienbacher, A. (2021). Fintech and access to finance. *Journal of Corporate Finance*, 68(December 2020), 101941. <https://doi.org/10.1016/j.jcorpfin.2021.101941>
- Cassar, G., Ittner, C. D., & Cavalluzzo, K. S. (2015). Alternative information sources and information asymmetry reduction: Evidence from small business debt. *Journal of Accounting and Economics*, 59(2–3), 242–263. <https://doi.org/10.1016/j.jacceco.2014.08.003>
- Christensen, C. M. (1997). *Innovator's Dilemma*. Harvard Business School Press.
- Christensen, C. M., McDonald, R., Altman, E. J., & Palmer, J. E. (2018). Disruptive Innovation: An Intellectual History and Directions for Future Research. *Journal of Management Studies*, 55(7), 1043–1078. <https://doi.org/10.1111/joms.12349>
- Christensen, C. M., Raynor, M., & McDonald, R. (2015). What Is Disruptive Innovation? *Harvard Business Review*, December.
- Dang, V. D. (2019). The effects of loan growth on bank performance: Evidence from Vietnam. *Management Science Letters*,

- 9, 899–910. <https://doi.org/10.5267/j.msl.2019.2.012>
- Das, S. (2017). *Banking on Disruption : Digitization, FinTech and the future of retail banking* (Issue June).
- Fu, J., & Mishra, M. (2022). Fintech in the time of COVID-19: Technological adoption during crises. *Journal of Financial Intermediation*, 50, 1–30. <https://doi.org/10.1016/j.jfi.2021.100945>
- 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>
- Jagtiani, J., & John, K. (2018). Fintech: The Impact on Consumers and Regulatory Responses. *Journal of Economics and Business*, 100, 1–6. <https://doi.org/10.1016/j.jeconbus.2018.11.002>
- Jagtiani, J., & Lemieux, C. (2018). Do fintech lenders penetrate areas that are underserved by traditional banks? *Journal of Economics and Business*, 100(March), 43–54. <https://doi.org/10.1016/j.jeconbus.2018.03.001>
- Jiang, C., Xu, Q., Zhang, W., Li, M., & Yang, S. (2018). Does automatic bidding mechanism affect herding behavior? Evidence from online P2P lending in China. *Journal of Behavioral and Experimental Finance*, 20, 39–44. <https://doi.org/10.1016/j.jbef.2018.07.001>
- 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>
- Kolari, J., Berney, R., & Ou, C. (1996). Small Business Lending and Bank Profitability. *The Journal of Entrepreneurial Finance*, 5(1), 1–15.
- Lancaster, K. J. (1966). A New Approach To Consumer Theory. *Journal of Political Economy*, 74(2), 132–157. <https://doi.org/doi.org/10.1086/259131>
- Le, M. T. H. (2021). Examining factors that boost intention and loyalty to use Fintech post-COVID-19 lockdown as a new normal behavior. *Heliyon*, 7(8), e07821. <https://doi.org/10.1016/j.heliyon.2021.e07821>
- Levin, J., & Milgrom, P. (2004). *Consumer theory*. [https://web.stanford.edu/~jdlevin/Econ 202/Consumer Theory.pdf](https://web.stanford.edu/~jdlevin/Econ%202/Consumer%20Theory.pdf)
- Murinde, V., Rizopoulos, E., & Zachariadis, M. (2022). The impact of the FinTech revolution on the future of banking: Opportunities and risks. *International Review of Financial Analysis*, 81(December 2021), 102103. <https://doi.org/10.1016/j.irfa.2022.102103>
- Nugraha, D. P., Setiawan, B., Nathan, R. J., & Fekete-Farkas, M. (2022). Fintech Adoption Drivers for Innovation for SMEs in Indonesia. *Journal of Open Innovation: Technology, Market, and Complexity*, 8(4), 208. <https://doi.org/10.3390/joitmc8040208>
- Otoritas Jasa Keuangan. (2023). *Statistik Fintech Lending Periode Desember 2022*.
- Phan, D. H. B., Narayan, P. K., Rahman, R. E., & Hutabarat, A. R. (2019). Do financial technology firms influence bank performance? *Pacific-Basin Finance Journal*, November 2, 1–13. <https://doi.org/10.1016/j.pacfin.2019.101210>
- 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>
- Shawtari, F. A. M. (2018). Ownership type, bank models, and bank performance: the case of the Yemeni banking sector. *International Journal of Productivity and Performance Management*, 67(8), 1271–1289. <https://doi.org/10.1108/IJPPM-01-2018-0029>
- Sheth, J. (2020). Impact of Covid-19 on consumer behavior: Will the old habits return or die? *Journal of Business Research*, 117, 280–283. <https://doi.org/10.1016/j.jbusres.2020.05.059>
- Soluk, J., Kammerlander, N., & De Massis, A. (2021). Exogenous shocks and the adaptive capacity of family firms: exploring behavioral changes and digital technologies in the COVID-19 pandemic. *R and D Management*, 51(4), 364–380. <https://doi.org/10.1111/radm.12471>
- 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>
- Tut, D. (2023). FinTech and the COVID-19 pandemic: Evidence from electronic payment systems. *Emerging Markets Review*, 54(January), 100999. <https://doi.org/10.1016/j.ememar.2023.100999>
- Wu, M., & Hua, C. (2018). Effects of shadow banking on bank risks from the view of capital adequacy. *International Review of Economics and Finance*, 1–22. <https://doi.org/10.1016/j.iref.2018.09.004>
- 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>

