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Does Borrower Domicile Influence the Credit Default in P2P Lending? Preliminary Analysis from Indonesia

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Abstract

Purpose: Credit risk is one of the most fundamental risks that P2P lending platforms have. The magnitude of information asymmetry, consumer behavior, and the unequal distribution of financial literacy make credit risk in P2P lending more vulnerable in several parts of Indonesia. The purpose of this study was to determine the domicile of the borrower on the credit risk in P2P lending
Methodology: We use time series data from January 2018-December 2021 for analysis. Vector Error Correction Model (VECM) is used to analyze the data.
Findings: The results show that borrowers domiciled outside Java influence the credit default significantly positively, while borrowers domiciled in Java influence credit default significantly negatively. Moreover, interest rate influences positively significant on P2P lending default, while inflation influences positively on P2P lending default.
Novelty: this paper is the first paper to analyze the P2P credit default in Indonesia using time series analysis.

Keywords: P2P lending, credit risk, borrower's domicile

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Introduction

The role of technology in the 4.0 era has a significant impact on all business sectors including the financial sector. The company landscape has shifted from traditional to digital. Intermediation institutions in the financial industry, which were formerly led by the banking sector, are now beginning to move toward digitally-based intermediation institutions. The organization uses peer-to-peer lending technology, sometimes known as P2P lending. P2P lending has increased rapidly over the past few years in several countries including Indonesia. According to Financial Service Authority (OJK) statistics on fintech lending, there were 147 fintech lending businesses as of March 2021, with 18,524,444 active borrowers, 19 trillion in outstanding loans, and total assets of Rp4 trillion. Along with the rising internet usage, fintech lending and P2P lending are mushrooming (Santoso et al., 2020).

P2P lending, which focuses on lending, bears the same risk as traditional intermediate institutions like banks as do intermediary institutions in general. The risk of credit default is one of the most important concerns in peer-to-peer lending (de Roure et al., 2017)(Santoso et al., 2020)(X. Lin et al., 2017)(Li et al., 2016)(Emekter et al., 2015). Because of the asymmetric information between the lender and the borrower, there is a default risk on the P2P lending platform (Hidajat, 2021)(Suryono et al., 2019). Nevertheless, P2P platforms use unethical (unethical) behavior toward borrowers while

making payments as a result of the danger of default in peer-to-peer lending, including intimidating borrowers, borrowers' families, and borrowers' relatives. Moreover, to avoid being charged by P2P lending sites, some borrowers have even attempted suicide (Hidajat, 2020). The risk of default on P2P platforms is exacerbated by the consumptive nature and lack of literacy of Indonesians regarding P2P lending platforms and debt literacy (Hidajat, 2021)(Suryono et al., 2021)(Yunus, 2019). However, the P2P lending platform provides a way for people to meet their financial needs, particularly for those who lack access to traditional banking services or unbanked people (Santoso et al., 2020).

On the other hand, academicians and researchers are now concerned about the issue of credit risk on P2P lending platforms (Jiang et al., 2018). Several researchers and academics have conducted research on credit risk on P2P lending platforms such as (Serrano-Cinca et al., 2015)(X. Lin et al., 2017)(Dietrich & Wernli, 2017) found that factors causing negative credit in peer-to-peer lending include the borrower's credit history, income, and household economy. Meanwhile, (Ma & Wang, 2016)(Byanjankar et al., 2015) found that authority regulations and borrower morals influence the likelihood of default. Additionally, the platform's high-interest rates, administration costs, and information costs may increase the likelihood of default (Liu & Xia, 2017). However, the majority of research is conducted in China or other developed countries.

Meanwhile, research on credit risk on P2P lending platforms in Indonesia is still limited. Several studies have been conducted by (Suryono et al., 2019) who found that loan details, financial status, credit status, and borrower information were factors that affected the risk of default. Then, (Muhammad et al., 2021) found that the size of the loan, governance, and debt conditions are factors that affect the risk of default. And also (Santoso et al., 2020) found that the characteristics of the borrower determine the default status of the borrower. However, the majority of these studies were conducted using primary data taken through questionnaires or using limited data from several P2P lending platforms.

In contrast to earlier studies, this paper focuses on borrowers' domicile on credit default in Indonesian peer-to-peer lending. According to the literature analysis, this study is the first to use secondary time series data to investigate credit default in Indonesian P2P lending based on the borrower's domicile. The objective of this study is to determine whether the domicile of borrowers is influencing the credit default on P2P lending or not. The Financial Services Authority defines P2P lending as a platform that directly connects lenders and borrowers. It is clear from this definition that lenders bear the whole cost of credit risk. In the meanwhile, the site only offers scant details (information asymmetry) about potential borrowers. (Liu & Xia, 2017)(Suryono et al., 2019)(Emekter et al., 2015).

The bulk of lenders on the P2P platform, on the other hand, are not professionals, making it challenging for lenders to screen applicants. P2P lending users are lenders (Iyer et al., 2016). Moreover, it is challenging for lenders to determine the credit risk associated with each borrower due to the unequal levels of financial and debt literacy (Serrano-Cinca et al., 2015)(Iyer et al., 2016)(Hidajat, 2021)(Yunus, 2019). Nonetheless, the borrower's characteristics can differ depending on the social value of each domicile (Santoso et al., 2020). Thus, it is crucial to understand how the domicile of borrowers affects credit default. Whether borrowers from particular regions significantly increase credit risk in peer-to-peer lending, regarding that financial literacy is not equally distributed across all of Indonesia (Ojk, 2017)(Otoritas Jasa Keuangan, 2019). Furthermore, M. Lin, (2013) and Gao, Yen, & Liu, (2021) believes that low-interest rates, proximity to the borrower, and social elements from the borrower all have an impact on the success of credit in peer-to-peer lending. Whereas (Duarte et al., 2012) argue that credit risk is reduced for reliable borrowers.

Furthermore, we believe that the findings of this study will significantly support the growth of peer-to-peer lending in Indonesia. The findings of this study can be used by academics as a literature review for other research. The findings of this study can be used by regulators to assess and enhance

Indonesia's regulations governing P2P lending, particularly regarding credit risk management. The findings of this study can be used by society as guidance for lending to and investing in P2P lending. The author then divides this essay into six sections: introduction, literature review, data and methods, conclusion, and suggestions for further research.

Literature Review

Credit Default in P2P Lending

The most fundamental risk of P2P lending platforms is credit risk. One of the causes of credit risk is due to information asymmetry between lenders and borrowers (Pokorná & Sponer, 2016)(Ma & Wang, 2016)(Serrano-Cinca et al., 2015). Meanwhile, the platform offers scant details about the borrower, additionally, it makes credit risk worse because lenders, the majority of whom are not experts in credit risk analysis, directly bear the burden of credit risk (Li et al., 2016)(Iyer et al., 2016). In addition, the Indonesian people who tend to be consumptive and are accompanied by low financial literacy make credit risk in P2P lending more vulnerable (Hidajat, 2021)(Yunus, 2019). Credit risk on P2P lending platforms needs to be managed properly because credit risk on P2P lending platforms is a contagion risk that can spread to other P2P lending platforms (Zhao et al., 2021).

Myriad factors influence credit failure in peer-to-peer lending, including loan objectives, income, household economic conditions, credit history, and debt. (Suryono et al., 2019)(Serrano-Cinca et al., 2015)(Dietrich & Wernli, 2017). Meanwhile, (Emekter et al., 2015)(Gao et al., 2021)(Santoso et al., 2020)(de Roure et al., 2017) showed that borrower defaults in peer-to-peer lending were influenced by high-interest rates. The moral hazard of borrowers is also increased by the high-interest costs. (Li et al., 2016). On the other hand, (X. Lin et al., 2017) found that borrower demographics such as age, gender, educational level, and marital status also affect credit risk in P2P lending. Ma & Wang, (2016) and Byanjankar et al., (2015) found that the level of moral of borrowers, borrower stability, and regulations influence credit default in P2P lending.

On the other hand, lenders must pay attention to several additional elements that can boost credit success on P2P lending platforms, such as social factors from the borrower, proximity to the borrower, and low-interest rates, to increase the likelihood of credit success. (M. Lin, 2013)(Gao et al., 2021). Because borrowers who have good trustworthiness have lower credit risk (Duarte et al., 2012). In addition to providing low-interest rates, lenders also need to pay attention to the credit ranking of the borrower (Emekter et al., 2015). Cai et al., (2016) believe that lenders must pay attention to the type of borrower, such as whether the borrower has already made a loan, is this the first loan, or has borrowed from a different lender. Because this type of borrower can provide signals and information that can be captured by lenders to reduce the risk of default.

P2P Lending in Indonesia

In 2018, internet penetration in Indonesia reached 68.4%, or around 170 million people in Indonesia were connected to the internet. Then, 17% of internet users are used for banking and financial transactions (APJII, 2019). In addition, the majority of businesses in Indonesia are MSMEs which have many obstacles to accessing capital from financial institutions, such as not having collateral (Davis et al., 2017). Then, among the factors that encourage MSMEs to use P2P lending are quick access, interest rates, low administrative costs, and loan flexibility (Rosavina et al., 2019). This demonstrates the tremendous potential for P2P financing in Indonesia. P2P lending has many important effects on financial inclusion (Davis et al., 2017).

The OJK then released a financial services authority regulation, or POJK no. 77 of 2016, regarding information technology-based money lending services to support the explosive growth of P2P lending in Indonesia. However, a lot of scholars point out how these rules can't support P2P lending in Indonesia. Suryono et al., (2019) believe that despite the rapid advancement of technology, OJK regulations have not been able to keep up. Furthermore, it is believed that the OJK regulations are unable to address issues with illegal fintech, data fraud, personal data, and marketing ethics from fintech that are still active in Indonesia. (Hidajat, 2020)(Suryono et al., 2021). However, (Santoso et al., 2020) found that OJK regulations have a detrimental effect on credit risk in P2P lending.

This paper also explores policy suggestions for reducing credit risk in peer-to-peer lending. Given the significance of government regulation for the viability of peer-to-peer lending in Indonesia. Moreover, one of the things that can reduce credit risk in peer-to-peer lending is government regulations and policies. (Ma & Wang, 2016)(Byanjankar et al., 2015).

Methodology

Data

The time series of monthly data used in this investigation. The information was gathered from the Financial Services Authority website's statistics on fintech loans. This study's research period runs from January 2018 to December 2021. The availability of P2P lending data from the Financial Services Authority (OJK) allowed for the establishment of the research period.

Assessing the factors that influence the borrower's domicile on credit default in P2P lending is one of the goals of this study. we divided the borrowers into two categories, the first is the borrower's domicile on Java Island or called Jawa, and the second is who has a domicile outside the Java Island, or called Non-Jawa. The categories divided is depended on the available data that is published by the Financial Service Authority (OJK). In this study, Vector Error Correction Model (VECM) is used to analyze the data. However, VECM is a part of the Vector Autoregressive Regression (VAR) model, even though, the VAR model is restricted only to stationary data. However, the non-stationary data will analyze in the VECM model. generating VECM has several steps, it begins with the unit root test then followed by the lag length selection, after that, the cointegration test, and VAR estimation are finally tested. The VECM equations are as follows:

$$DNPL = \propto + B_1 NPL_{it} + B_2 DJawa_{it} + B_3 DNonJawa_i + B_4 DMacro_i + B_5 Dummy_i + \varepsilon_{it}$$

Where $DNPL$ is the credit default in P2P Lending in the first difference level, $DJawa$ is the total lending by the borrower from Java Island in the second difference level, while $DNonJawa$ is the total lending by the borrower from outside Java Island in the second difference data. While $DMacro$ is the vector of macro variables including the interest rate and inflation in the first diffecrence. $Dummy$ is for the time before and during covid where the value (0) is before covid-19 and the value (1) is during the pandemic. Moreover, the definitions of variables are explained in the table 1:

Table 1. Variables Explanations

Variable	Explanation
NPL	Total credit default in P2P lending (%)
BIrate	Interest rate (%)
INF	Inflation rate (%)
Jawa	Total lending of the borrower from outside Java Island
NonJawa	Total lending of the borrower from Java Island
Dummy	Zero (0) is before covid-19, one (1) is during covid-19

Results and Discussion

Result

Table 2 provides a summary of the descriptive findings from the observations that have been made. On P2P lending platforms in Indonesia, the average percentage of default loans is extremely low at 3.1%, as can be observed from the descriptive statistics. This descriptive value demonstrates that Indonesian P2P lending is a platform with low credit risk. The average borrower transaction for Javanese borrowers is Rp. 861 billion, which is more than twice as much as the average borrower transaction for borrowers outside of Java, which is Rp. 155 billion. The descriptive statistics show that people who are on the island of Java do the bulk of the transactions.

Table 2. Descriptive Statistics

Variables	Mean	Std. Deviation	Min	Max
NPL	0.031149	0.020674	0.007500	0.088817
BIrate	4.625000	0.931140	3.500000	6.000000
INF	0.321969	0.625262	0.013200	1.870000
Jawa	86129.83	73151.90	2578.631	246625.3
NonJawa	15537.84	14276.99	423.9187	49227.31

Additionally, we performed a unit root test to determine the data's stationarity before using testing the hypothesis. Table 3 contains the results of the unit root test. These findings demonstrate that the data in this investigation have varying degrees of stationarity. Both at the level, first difference and second difference.

Table 3. Unit Root Test

Variables	level	First Difference	Second Difference
NPL	0.4469	0.0000***	0.0000***
BIrate	0.8376	0.0034***	0.0000***
INF	0.9635	0.0000***	0.0000***
NonJawa	1.0000	0.4551	0.0000***
Jawa	1.0000	0.5710	0.0000***

Sig. level 1%***, 5%**, 10%*,

After testing the unit root test, we test the data for the cointegration test. The cointegration test defines whether the variables have cointegrated over a long period. We use the Johansen cointegration test. The result showed that there is cointegration among variables in the long run. This indicates that the hypotheses testing will run with the VECM model.

Table 4. Cointegration Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.601843	91.45541	69.81889	0.0004***
At most 1 *	0.395390	50.01448	47.85613	0.0309**
At most 2	0.339723	27.37174	29.79707	0.0929
At most 3	0.166403	8.692403	15.49471	0.3946
At most 4	0.011097	0.502148	3.841466	0.4786

Then we continue to the lag length criteria test. The lag length criteria test used in this model is by the value of LR test statistics, Final Prediction Error (FPE), Akaike information criterion (AIC), Schwarz information criterion (SC), and Hannan-Quinn information criterion (HQ). the asterisk (*) value will be used for the lag order whereas, in this study, we use lag 2 as the lag length criteria. The result of the lag length criteria is as follows:

Table 5. Lag length Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-864.5910	NA	1.81e+10	37.80831	38.00707	37.88276
1	-500.9872	632.3544	7364.964*	23.08640*	24.27899*	23.53315*
2	-476.1894	37.73578*	7731.197	23.09519	25.28161	23.91424

* Indicates lag order selected by the criterion

After that, we test the hypotheses testing using the vector error correction model (VECM). Short-term and long-term effects are applied to analyze whether a borrower's domicile is influenced by the credit default in P2P lending or not. The findings show that in the long-term period borrower's domicile influence the credit default in P2P lending in Indonesia. Nevertheless, the Java domicile

influenced negatively the credit default, while the outside Java Island influenced positively in P2P lending default in Indonesia. This indicates that borrowers outside Java Island are riskier rather than borrowers from Java Island. Moreover, the covid-19 pandemic worsens credit default in P2P lending.

On the other hand, in the short-term period, the dummy variable and inflation positively influence the credit default in P2P lending in Indonesia. This indicates that covid-19 pandemic and the macro condition affect P2P lending significantly. Moreover, the lag in each variable influences the change in each variable today. This indicates that the history of the variable is influencing its future.

Table 6. Hypotheses Testing

Long term effect

D(NPL)	D(BIrate)	D(NONJAWA)	D(JAWA)	D(INF)	DUMMY	C
1.000000	[-7.16050]***	[6.23567]***	[-6.42805]***	[4.97031]***	[-3.22454]***	0.164064

Short Term effect

	D(NPL)	D(BIrate)	D(NONJAWA)	D(JAWA)	D(INF)	DUMMY
	Lag 1 Lag 2	Lag 1 Lag 2	Lag 1 Lag 2	Lag 1 Lag 2	Lag 1 Lag 2	Lag 1 Lag 2
CointEq1	[0.49997]	[3.07807]	[-0.39424]	[1.96249]	[-3.11844]	[0.71611]
D(NPL)	[-2.68348]***	[-0.30421]	[0.82539]	[0.25392]	[1.31373]	[1.73528]
	[-1.85606]*	[1.22392]	[-0.21444]	[-0.35856]	[2.59081]**	[2.61478]***
D(BIrate)	[-0.13518]	[0.24703]	[-0.36363]	[1.81560]*	[-1.98608]*	[0.22130]
	[0.64365]	[-1.28276]	[1.61299]	[2.80062]***	[-2.27266]**	[0.37735]
D(NONJAWA)	[-0.77019]	[-1.70522]*	[-0.59973]	[-0.33716]	[2.27155]**	[-0.73838]
	[-0.90715]	[-1.84843]	[-4.05622]***	[-3.69420]***	[2.77337]***	[0.01887]
D(JAWA)	[0.49484]	[1.80185]	[0.55153]	[0.22855]	[-1.83026]*	[0.28409]
	[0.72105]	[1.47221]	[4.16815]***	[3.50225]***	[-1.13899]	[-0.23433]
D(INF)	[-0.42902]	[-1.71507]	[-0.23336]	[-1.92962]	[-0.88705]	[-0.51674]
	[-0.36414]	[-1.50144]	[0.53913]	[-0.58038]	[-2.29568]**	[-0.53212]
DUMMY	[-0.83099]	[-0.15749]	[-0.06460]	[-0.01932]	[-0.12394]	[0.02647]
	[0.03793]	[0.62928]	[-0.21806]	[0.05357]	[0.51437]	[0.80139]
C	[0.36747]	[-0.17347]	[0.85093]	[1.15108]	[-0.47271]	[0.76107]
R-squared	0.316877	0.513908	0.569532	0.503818	0.670837	0.249204

Dependent variable: NPL, sig. level 1%***, 5%**, 10%*

Analysis

The investigation in this paper begins with the variables affecting credit failure in peer-to-peer lending. From the perspective of the borrower, borrowers from outside of Java significantly raise the

risk of credit failure, whereas borrowers with residence in Java significantly reduce the risk of credit default. These findings suggest that Java-domiciled borrowers are less likely to default than non-java-domiciled borrowers. Borrowers domiciled in Java have a lower default risk than those domiciled elsewhere for two key reasons. The first is a result of the Javanese population having more financial knowledge than persons living outside of Java (see chart 4.5). Second, debtors with a domicile in Java are more morally responsible for making payments before maturity than those with a domicile outside of Java. The findings are in line with (Ma & Wang, 2016)(Byanjankar et al., 2015)(Emekter et al., 2015) that moral level affects the risk of default in P2P lending. Although in terms of the number of transactions, borrowers from Java have a larger number of transactions compared to borrowers from outside Java.

Then it is added that, in comparison to Javanese citizens' financial literacy, the literacy level of those living outside of Java is still low. As discovered by (Hidajat, 2021)(Yunus, 2019) that the risk of default in peer-to-peer lending is influenced by financial and debt literacy. Despite having a wider geographic reach than Java, the average financial literacy of people living outside of Java is still lower than that of Javanese people. These results confirm the assertion (Serrano-Cinca et al., 2015)(Iyer et al., 2016) because P2P lenders lack professionalism, making it challenging to assess credit risk. Additionally, compared to lenders with domiciles in Java and outside of Indonesia, lenders from outside Java have a bigger information asymmetry. Information asymmetry in P2P lending can impact the likelihood of default (Pokorná & Sponer, 2016)(Ma & Wang, 2016)(Serrano-Cinca et al., 2015). According to the study's findings, investors or lenders should consider the borrower's domicile, regardless of whether the borrower is from a region where the domicile is vulnerable to the risk of default or not. These findings also demonstrate that transactions by borrowers rather than lenders are more likely to result in a default on the P2P lending platform. It was said by (Liu & Xia, 2017) that the informational imbalance in peer-to-peer lending favors borrowers over lenders in terms of financial gain. Then, to lower the risk of default, lenders must improve the credit analysis of potential borrowers.

Furthermore, from a macroeconomic variable, the findings demonstrate that inflation has a markedly positive impact on the default risk associated with peer-to-peer lending. The positive influence of inflation on the P2P lending credit default indicates that through P2P lending the economic cycle is run faster. Considering that MSMEs who are not banked make up the majority of P2P users. P2P financing thereby provides MSMEs with much-needed funding to carry out manufacturing and manage their businesses (Davis et al., 2017). Meanwhile, the central bank interest rate variable has a negatively significant effect on credit failure in P2P lending. This indicates that the determination of interest rates on P2P lending is crucial in mitigating the default in P2P lending (Santoso et al., 2020). Thus, monetary authorities must control the interest rate set by P2P lending lenders. So lenders can arbitrarily provide appropriate interest rates to borrowers. Even though the authorities have an important role in minimizing credit risk in P2P lending (Ma & Wang, 2016)(Byanjankar et al., 2015).

Conclusions

P2P lending is one of the growing financial intermediations in Indonesia. moreover, P2P lending also boosts financial inclusiveness in Indonesia. However, financial intermediation, the fundamental risk of P2P lending is credit default. The distinguished domicile of the borrowers becomes a challenge for P2P lending to mitigate the credit risk. This paper aims to evaluate the role of the borrower's domicile on the P2P lending default in Indonesia. We divided the domicile into two categories, the first is the Java Island and the second is the outside Java island.

The result of this paper showed that Java domicile has negatively influenced the Credit default in P2P lending, while the outside Java Island positively influenced the credit default. the finding implies that the borrower's domicile has different characteristics to fulfill their responsibility to pay the bill in P2P lending. Moreover, a macroeconomic variable such as inflation has a positive significant influence on the P2P lending credit default. Meanwhile, the interest rate has a negative significant influence on

the credit default of P2P lending. The result suggests that monetary authority plays a crucial role in reducing P2P lending default, especially interest rate policy. Meanwhile, the positive influence of inflation on P2P lending indicates that the existence of P2P lending in Indonesia boosts the economic cycle, whereas the majority of P2P lending borrowers could be the MSMEs which are classified as the unbanked customers.

However, this research still has limitations, including: first, the research period is relatively short (2018-2021). Then secondly, the limited data available openly by researchers. Third, the limitations of analysis tools that only use time series data. Furthermore, research on the risk of default in P2P lending based on the borrower's domicile needs to be repeated using a panel data approach and with a longer research period to produce more comprehensive results.

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