Available online at
https://journal.uitm.edu.my/ojs/index.php/JEEIR

e-ISSN: 2289-2559

Journal of Emerging Economies & Islamic Research 12(1) 2024, 576.

Journal of Emerging Economies and Islamic Research

P2P lending approval and sectors segmentation: Investigating the Malaysia key factors

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ARTICLE INFO

Article history:
Received 20 October 2023
Accepted 20 December 2023
Published 31 January 2024

Keywords:
FinTech
P2P lending
ARDL
Industrial

DOI:
10.24191/jeeir.v12i1.576

ABSTRACT

The purpose of this research is to determine the long- and short-run factors influencing the probability of obtaining loan under the peer-to-peer (P2P) lending platform with the segmentation of wholesale and trade, manufacturing, and agriculture sectors. As the FinTech lending is a popular tool for business financing alternative among the Micro, Small Medium Enterprises (MSMEs), the effect of information asymmetry may be varied from one industry to another. The study was conducted using data provided by Securities Commissions and Central Bank of Malaysian samples and employed the Autoregressive Distributed Lag (ARDL) approach. The results indicate that the interest rate on the platform has an insignificant impact on the success of P2P lending over time. On the other hand, factors such as loan tenure, investment size, Base Lending Rate (BLR), and inflation exhibit a significant influence in both the short and long term, depending on the segmentation of industrial sectors. This study is among the pioneering works that delve into P2P lending in Malaysia, considering that the concept has only been implemented since 2017. These research findings can be viewed as valuable insights for industrial borrowers, lenders, and platforms when engaging in economic activities through P2P lending, particularly in the Malaysian context.

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https://doi.org/10.24191/jeeir.v12i1.576

1. Introduction

The lending approval process in P2P platforms is a critical aspect that involves the evaluation and decision-making regarding loan applications. Typically, this process begins with prospective borrowers submitting their loan requests on the platform. Currently, the P2P lending platform serves solely as an information mediator, performing credit checks, rating borrowers' eligibility, providing lending rates, posting credit online information, and monitoring the execution of financing contracts (Wang, Chen, Jin, & Fan, 2022). The platforms often utilize a combination of traditional credit scoring methods and alternative data sources to assess the risk associated with each borrower. This data-driven approach allows P2P lending platforms to make informed decisions and allocate risk appropriately (Luo, Xiong, Zhou, Guo, & Deng, 2011). Additionally, the platforms may consider the interest rates proposed by borrowers, creating a marketplace where lenders can choose the loans that align with their risk tolerance and investment preferences.

Previous studies have underscored the challenge of information transparency, often overlooking the influence of external factors, which become more evident during difficult times where the alternative financing mostly used by the micro, small and medium enterprise (MSMEs) (Chin, Zakaria, Purhanudin, & Pin, 2021; Lee & Megargel, 2021; Ofir, Tzang, & Radzyner, 2022) . The combination of issues related to information asymmetry and the economic variable in P2P lending creates a complex landscape with significant implications specifically within the industries. Information asymmetry, where borrowers possess more information than lenders, poses challenges to the accuracy of loan approval processes on P2P platforms (Akerlof, 1970; Stiglitz & Weiss, 1992). This imbalance can lead to uncertainties about borrowers' creditworthiness, potentially affecting the performance and reliability of P2P lending as a financial model. In conjunction with information asymmetry, the economic impact introduces an additional layer of complexity in sectoral industries. External factors, such as economic instability highlighted by Minsky theory, fluctuations in interest rates and inflation can influence borrower behavior and impact their ability to repay loans. During financial downturns, individuals may seek alternative financing options, altering the risk profile for lenders and potentially leading to increased default rates (Ibrahim & Shah, 2012; Wong & Eng, 2020). Moreover, the economic impact can exacerbate information asymmetry as borrowers may be less willing to disclose comprehensive financial information in uncertain economic conditions. This reluctance could further hinder lenders' ability to make well-informed lending decisions.

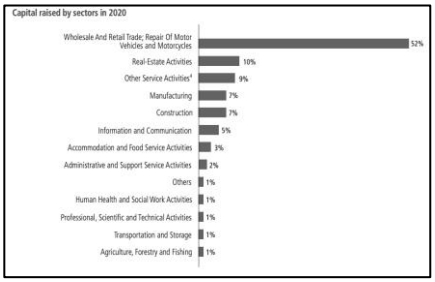

Figure 1: Successful capital raised by sectors in P2P lending in Malaysia. Sources: Securities Commission of Malaysia, (2021)

In a growing P2P market, Securities Commissions Malaysia (2022) reported the substantial growth P2P financing sector, as evidenced by a robust 38.6% surge in funds raised, amounting to RM1.58 billion. This growth is primarily attributed to a considerable increase in the number of campaigns, reaching 24,455, and a notable expansion in the investor base, exceeding 16,000 participants. The sectoral distribution of funds indicates the "wholesale and retail trade; repair of motor vehicles and motorcycles" as the predominant beneficiary, securing RM927.72 million. Concurrently, the preponderance of smaller fundraising amounts, with 70% of campaigns securing funds at RM50,000 or below, signals a trend in campaign characteristics. Notably, many campaigns continue to focus on working capital needs. Furthermore, the prevalence of

https://doi.org/10.24191/jeeir.v12i1.576

shorter-term financing, with 69% of investment notes having tenures of three months or less, prompts consideration of its implications for both businesses and investors within this burgeoning financial ecosystem. Positive trends highlighted in the statistics explained an increase in fund raised and shows a growing number of campaigns with expanding base of participating investors accordingly with the sectoral involvement in Malaysian market.

This paper aims to explore the dynamic key factors such as platform interest rates, loan tenure, investment size, BLR and inflation rate drive loan approval in P2P lending platforms based on sectors segregation. In this research, we make the inaugural contribution to the study offering unique insights and valuable perspectives that have not been explored previously. This paper is closely related to the previous work where the analysis is extended to the sectoral segmentation available in Malaysian market. The current study's analysis utilized data concerning the categorization of sectors in the successful applications of P2P financing by MSMEs. Sector allocation was determined based on three criteria (higher, medium, and low) related to the total capital raised by sectors in the year 2020 in Figure 1. This paper makes contributions in two ways. First, it will initially contribute to signaling criteria and allow the industry to respond to the determinants of loan success, considering financial and economic factors. Secondly, the findings will assist industry participants in initiating improvements and advancements in P2P lending applications, particularly since the industry is still in the developmental phase, outlining ideal criteria for those seeking alternative business financing.

The structure of this paper is as follows: Section 2 presents related literature review; Section 3 details on data and methodology; Section 4 is findings the; and Section 5 provides the conclusion.

2. Literature review

The empirical studies reviewed in this section focused on related research that employed sectoral industry as their sampling method in various P2P lending contexts. Subsequently, additional reviews were conducted concerning studies aligned with the Malaysian P2P lending concept.

2.1 P2P lending in sectoral industries

There is limited existing literature that specifically examines the sectoral impact on P2P lending. Study by Ofir et al., (2022) revealed substantial variations in loan interest rates influenced by factors including the presence of different industry types such as others, services, industry, agriculture, manufacturing and fuel commerce, construction and real estate, and hospitality. Notably, debt restructuring carried the highest interest rates, contrasting with lower rates observed for active loans and recovered debts. Loans undergoing legal proceedings or refinancing showed no significant differences between them. Within corporate types, the "other" category incurred the highest rates, though not statistically distinct from other categories. Study evidence from Kiva (P2P lending platforms accommodates 15 loan sectors, encompassing agriculture, clothing, housing, education, health, transportation, personal use, services, manufacturing, arts, entertainment, retail, wholesale, and construction), indicate an upward trends on both the demand and supply sides of P2P lending in the post-crisis period where, borrowers exhibit an increased demand for financial capital, while lenders demonstrate heightened activity in their lending behaviors (Yang, Wang, Ding, & Hahn, 2016). In the context of P2P loan default, research using 16 various sectors such as agriculture, property, and construction, automotive, manufacturing and engineering, arts and entertainment are exerting a substantial influence on the likelihood of loan default. Notably, other factors such as the interest rate, loan term, and loan purpose for capital needs emerge as the three most critical determinants affecting both the probability of loan defaults and the survival time of loans (Xu, Su, & Celler, 2021). In addition, a study scrutinized the adoption of P2P lending platforms to discern the factors prompting SMEs to utilize these platforms for loan acquisition has done by (Rosavina, Rahadi, Kitri, Nuraeni, & Mayangsari, 2019). Findings with selected sectors for sampling encompassed manufacturers, transportation, financial

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services, other services, social enterprises, and mining indicates that elements such as loan processes, interest rates, loan costs, loan amounts, and loan flexibility exert substantial influence on SMEs' decisions to secure loans through P2P lending. Conversely, Kgoroeadira, Burke, & van Stel, (2019) investigated the impact of a business profile on loan approval with business profiles were categorized across various industries, including construction, transportation, services, retail and trade, manufacturing, wholesale, agriculture, finance, and real estate. The criteria used to assess loan levels included credit grade, homeownership, income range, employment status, and the presence of an existing firm or business profile. Findings reveals that, in this market, lenders tend to overlook business characteristics, emphasizing personal attributes, especially credit score, employment status, and provided collateral. This suggests that entrepreneurs seeking financing in P2P market should tailor their pitches to highlight personal characteristics rather than traditional firm-related features, as these personal aspects play a pivotal role in securing funding and determining associated costs. Focusing on the manufacturing sectors difficulties in acquiring fund, Tambunan, Santoso, Busneti, & Batunanggar, (2021) explored a progress on MSMEs challenges in accessing alternative financing through P2P platforms. Findings revealed a persistent growth in the number of MSMEs despite encountering various challenges, with limited access to funding being the most significant hurdle. Consequently, the survey underscores the importance of P2P lending as a crucial alternative funding source for MSMEs, with banks emerging as the primary investors in P2P lending companies in Indonesia.

2.2 Empirical review of P2P lending in Malaysia

Realizing the literature gap in Malaysian P2P concept, the following related studies were up to this date explored in the country. Several authors have done a few empirical studies on Malaysia's P2P lending with various perspectives on the industry. Since their inception in 2016, the Securities Commission of Malaysia has licensed eleven P2P lending platforms. According to Zhe, (2019), this industry has seen rapid growth in only 30 months' time since their first operation in 2017. Previously, a review of the common facts from industry and outside sources, typical opinions about SMEs' funding issues suggest that in a new growth area, the creation of alternative financing outlets to supplement the banking system will continue to be a top focus in the future this is due to that given banks' fiduciary obligation to guarantee the safety of the public's deposits and discourage excessive risk-taking, bank funding will continue to be unsuitable for some enterprises in such sectors (Haniff, Lailatul, & Lee, 2017).

According to a study conducted that analyzed internal data from platforms in Malaysian experience, borrowings with identical credit scoring and loan goals pay investors significantly varied interest rates. Furthermore, lending with a short duration may resulting in a greater lending rate compared to those who had a lengthier maturity. Ultimately, borrowing from business company that have similar sector background emerged to be heterogenic in interest implementation (Nguyen, Kalabeki, Muthaiyah, Yu, Hui, & Mohamed, 2021). A study by Khan & Xuan, (2021) looks at how a borrower's loan tenure and financing purpose, influence the likelihood of a lending decision on a Malaysia P2P platform. The findings imply that a borrower's loan length raises the possibility of lending on an online P2P platform. The findings add to the idea of signaling information to the loan application performance as well. According to a survey on Malaysian awareness of an online funding substitute for small businesses in the future to support the growth and expansion of their firms, most respondents' understanding of P2P lending and crowdfunding as alternative financing tools is still low. However, based on the perception findings based on the studied sample, most respondents have a marginally optimistic reaction and impression of the rise of financial innovation These findings designate that there is a demand and potential for a government-approved organization to raise awareness among SMEs and start-ups funding (Ghazali & Yasuoka, 2018).

An enhanced technology acceptability model and a structured survey questionnaire were used to test research into the characteristics that drive borrowing application performance of lending via P2P online borrowings in the Klang Valley area. Findings highlighted trust influences or drives investing intentions.

https://doi.org/10.24191/jeeir.v12i1.576

The study's findings have managerial and theoretical implications, higher education, as well as social and electronic media, has a significance contribution in creating awareness (Thaker, Thaker, Rahman, Amin, Pitchay, & Olaniyi, 2019). On the other hand, P2P platform simplicity of use on its utility, perceived competence, P2P platform trustworthiness, and reciprocity are all factors that influence the desire in using P2P online applications. The results highlighted the simplicity of use, utility, and reciprocity of P2P platforms affect the inclination to utilize the new method of lending alternatives. The result indicates that P2P operators would place a greater emphasis on the platform's ease of use and usefulness with reciprocity to increase borrowers' or lenders' practice intentions (Khan, Yee, & Gan, 2023). Finally, Wong & Eng (2019), identified a hike in the policy rate as having an influence on Malaysia's monetary policy, which would result in a move concerning the alternative financing as such online P2P. Raising the volume of borrowers enhances deposit involvement through the online P2P services and thus, increases advantages to the borrowers by interpreting liquidity accessible at lower offered lending rates. Despite monetary tightening, corporate investment and, as a result, inflation is increasing. However, the significance of a platform density channel lessens when platform borrowings offer a nontrivial risk of default. Overall and yet, none of the studies have specifically investigated the crucial factors contributing to loan success in P2P lending in Malaysia sectors segmentation, with a particular focus on the information presented on platforms and the impact of economic factors within this industry.

3. Data and methodology

Encompassing the full operational period of the Malaysian P2P industry since its inception, this study utilized data from January 2017 to September 2022. The dataset, consisting of 69 months of observations segregated accordingly to each of the sectors namely wholesale, retail and trade, manufacturing, and agriculture, forestry, and fishing. All the monthly time series data was predominantly sourced from three sources which are the Securities Commissions of Malaysia, the Central Bank, and P2P platform providers. The preliminary data treatment will follow the sequence of descriptive analysis, stationarity test, and cointegration F-bound test to ensure a long-term existence among the variables. Given the constrained sample size available, the ARDL bound test is utilized as the statistical tool recommended by Pesaran, Shin, & Smith, (2001) in assessing the short and long-term impact of these variables' key factors. Dependent variable of total P2P successful loans by selected sectors in P2P lending measured in Ringgit Malaysia (RM). Whereas the independent variables of platform interest rates used a weighted average simple interest rates in percentage, loan tenure referred to the average tenure of notes in months, average investment size valued in RM, Based Lending Rates (BLR) and inflation (proxied by CPI) were both in percentage. Hence, the following ARDL estimation model used:

$$\begin{aligned} P2P_{i,t} \quad = \quad & \alpha + \beta_O P2P_{t-1} + \beta_1 Pir_{,t-1} + \beta_2 LT_{t-1} + \beta_3 ISZ_{t-1} + \beta_4 BLR_{t-1} \\ & + \beta_5 INF_{t-1} + \sum_{i=1}^{p-1} \theta_i \Delta P2P_{t-1} + \sum_{i=1}^{q-1} \theta_i \Delta Pir_{t-1} \\ & + \sum_{i=1}^{r-1} \theta_i \Delta LT_{t-1} + \sum_{i=1}^{s-1} \theta_i \Delta ISZ_{t-1} + \sum_{i=1}^{t-1} \theta_i \Delta BLR_{t-1} \\ & + \sum_{i=1}^{u-1} \theta_i \Delta INF_{t-1} + \varepsilon_t \end{aligned} \qquad (1)$$

Where, $P2P_{i,t}$ is the successful P2P lending fundraised, segregated by sector of *i*, over a time of *t*, Pir_t is the platform interest rate over a time of *t*, LT_t is the lending tenure over a time of *t*, ISZ_t is an investment size over a time of *t*. While BLR_t is the based lending rate over a time of *t*, INF_t is the inflation rate over a

time of *t* and ε_t is the error term and lag order. The *i* will be replaced as the dependent variables changes in sectors classification accordingly during the analysis.

4. Results and discussion

4.1 Descriptive statistic

This study conducts an essential analysis of the raw dataset to profile the chosen sample before regression estimation. Table 1 summarizes descriptive statistics on monthly data from January 1997 to September 2022. Standard deviation reveals the data dispersion, with platform interest rates (Pir) having the lowest (0.818) while, the successful P2P lending from wholesale, retail, and trade reported the highest with 24.131 (RM million). Skewness analysis indicates fair, moderate, or highly skewed data. While, platform interest rate (Pir), based lending rates (BLR), Inflation shows no skewness issues and investment size (Isz) exhibit moderate skewness. Agri sector displays high skewness with value of 4.891. Kurtosis, measuring the distribution's peak or flatness, suggests normal distribution for some variables and heavier tails for others. Pir and Inf show normal distribution (mesokurtic), while data form agriculture, forestry and fishing sector display heavy-tailed distributions (leptokurtic). The Jarque-Bera (JB) test examines the differences between series skewness and kurtosis from a normal distribution. Only Pir and Inf datasets conform to normal distribution, whereas others do not, rejecting the null hypothesis of data which is not normally distributed. Hence, to ensure consistency, the study transformed all variables using natural logarithms for regression analysis which had also applied by Nigmonov, Shams, & Alam, (2021), Zhang and Chen, (2017), supporting using logarithmic transformations to achieve symmetrically distributed variables.

Table 1. Summary statistics

	Max.	Min	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Prob.
Whole	98.434	0.000	24.131	1.194	3.734	17.946	0.000
Mfg	12.559	0.000	2.794	0.769	3.248	6.982	0.030
Agri	2.842	0.000	0.464	4.891	27.075	1941.481	0.000
Pir	15.140	1.000	0.818	0.182	3.43	0.910	0.634
Lt	24.000	1.000	4.410	2.195	8.823	152.910	0.000
Isz	15.930	0.693	4.482	0.791	2.246	8.833	0.012
BLR	6.922	5.490	0.598	-0.298	1.295	9.377	0.009
Inf	5.100	-2.900	1.973	-0.284	2.341	2.178	0.336

Notes: The dependent variable of sectoral industrial segregation represented by Whole (wholesale, retail, and trade), Mfg (manufacturing), and Agri (agriculture, forestry, and fishing). While the independent represent by platform interest rate (Pir), loan tenure (Lt), investment size (Isz), based lending rate (BLR), and inflation (nf).

4.2 Unit root test

The Augmented Dickey-Fuller (ADF) test and the Phillips-Perron (PP) test methodologies are employed to ascertain the presence or absence of unit roots within the series. The null hypothesis of both ADF and PP tests suggests the existence of a unit root when the variables lack stationarity. Both tests operate under the assumption of stable series. Additionally, a unit root test is conducted to ensure that none of the variable series are integrated beyond the *I*(1) integration level. This caution is necessary in ensuring the variables in the model did not passed its stationarity in integration of *I*(2). The occurrence of *I*(2) in the stationarity of the variables able to make an ARDL limits test that used for assessing long-term relationships, could be misleading.

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Table 2 depicts the results of unit root tests for all the variables. For the sectoral data, lnWhole, lnMfg, and lnAgri shows a degree of integration on its stationarity for both ADF and PP tests at zero degree of integration = *I*(0) at one percent significant level. On the other hand, variable of platform interest rate (lnPir) has also shown a degree of integration of *I*(0) followed by the other two variables which are loan tenure (lnLt) and investment size (lnIsz) with all at one percent significant level. However, the remaining variables of lnBLR and lnInf has shown non stationarity at level. The subsequent outcome moves to the first difference output, indicating that both variables are stationary at an integration level of one, *I*(1), at a one percent significance level. As all variables show significant stationarity levels within the range of *I*(0) and *I*(1), the unit root test results appear mixed. Consequently, upon closer inspection through the ADF and PP stationarity test, it can be confidently asserted that none of the variables are afflicted by any unit root issue. Moreover, the examination affirms that all variables maintain an integration level that does not surpass *I*(2), indicating a stable and coherent behavior within the model's framework.

Table 2. Results of stationarity test

	Augmented Dickey Fuller test		Phillip- Perron Test		Degree of
	Level	1st Difference	Level	1st Difference	Integration
lnWhole	-6.5845*	-	-6.7037*	-	*I* (0)
lnMfg	-5.2052	-	-5.3355*	-	*I* (0)
lnAgri	-9.6911	-	-9.5712*	-	*I* (0)
lnPir	-5.683*	-	-5.683*	-	*I* (0)
lnLt	-7.195*	-	-7.275*	-	*I* (0)
lnIsz	-3.788**	-	-3.821**	-	*I* (0)
lnBLR	-1.382	-4.872*	-1.744	-11.659*	*I* (1)
lnInf	-2.459	-2.316*	-2.459	-9.110*	*I* (1)

Notes: (*) Significant at the 1%, (**) Significant at the 5%. Degree of integration of zero I (0), degree of integration of one I (1).

4.3 ARDL estimation

Since the stationarity outcomes signify that the time series data meet the criteria for proceeding to the subsequent step, which involves determining the optimal lag for the equation before further analysis on ARDL estimation.

Table 3. Results of vector autoregression (VAR) estimates on lag order selection criteria

VAR Estimates	Sectors segmentation		
	lnWhole	lnMfg	lnAgri
R^2	0.5728	0.7724	0.6768
Adj. R^2	0.5078	0.7377	0.6276
AIC	-0.5438*	1.4090*	-1.3963*
SBC	-0.2492	1.7036	-1.1017
No. of Lags	4	4	2
Criterion	AIC	AIC	AIC

Notes: R2, R Squared, Adj. R2, Adjusted R Squared, (*) lowest criterion estimation, AIC: Akaike Information Criterion. ln refers to the logarithm transformation. lnWhole is the log of wholesale, retail and trade sector, lnMfg is the log of manufacturing sector, and lnAgri refers to log of agriculture, forestry and fishing sector.

https://doi.org/10.24191/jeeir.v12i1.576

Table 3 exhibited the best-fitted criterion for lnWhole is AIC with the lowest value of -0.5438 and the lag length selection is 4. Finally, for the lnMfg and lnAgri sector shown the lowest value of the criterion was estimated by AIC with the value of 1.4090 and -1.3963 respectively. Overall, the optimal lag length selection of each sectoral models on lnWhole, lnMfg and lnAgri was 4, 4, and 2 respectively.

Table 4. Results of long-run estimation coefficient

Dependent Variable: lnWhole				
Variables	Coefficient	Std. Error	T-stat	Prob
lnPir	0.0358	0.1260	0.2844	0.7779
lnLt	-0.0838	0.1421	-0.5894	0.5596
lnIsz	-0.0189	0.0519	-0.3647	0.7177
lnBLR	1.5163	0.8568	1.7698	0.0860*
lnInf	-0.0418	0.0744	-0.5614	0.5783
@Trend	0.0165	0.0032	5.2379	0.0000
Dependent Variable: lnMfg				
lnPir	0.2550	0.2269	1.1242	0.2693
lnLt	-0.7739	0.4401	-1.7586	0.0882*
lnIsz	-0.3552	0.1120	-3.1709	0.0033***
lnBLR	2.5719	1.6003	1.6071	0.1179
lnInf	-0.2991	0.1563	-1.9140	0.0646*
@Trend	0.0481	0.0061	7.8971	0.0000
Dependent Variable: lnAgri				
lnPir	0.0421	0.1717	0.2449	0.8079
lnLt	-1.3844	0.4105	-3.3722	0.0018***
lnIsz	-0.2483	0.1048	-2.3703	0.0233**
lnBLR	5.5114	1.5673	3.5166	0.0012***
lnInf	-0.3712	0.1259	-2.9499	0.0056***
@Trend	0.0333	0.0064	5.2232	0.0000

Notes: (*) Significance at 10% level, (**) Significance at 5% level, (***) Significance at 1% level

Table 4 outlines the long-term segregation results for selected industrial sectors. In the wholesale, retail, and trade sector, only lnBLR exhibits a positive and significant long-term connection. Conversely, other variables show no clear long-term relationship with this sector. In the manufacturing sector, three variables have significant long-term effects. Surprisingly, loan tenure and investment size have negative impacts, while inflation reduces P2P granted loans. The remaining variables, lnPir and lnBLR, do not significantly impact total manufacturing P2P lending success. In the agriculture, fishing, and forestry sector, all variables except platform interest rates show long-term mixed effects. Three variables have negative impacts, and lnBLR has a positive effect, redirecting investors and borrowers to alternative financing. Despite variations, each model contains at least one significant variable, highlighting diverse long-term effects in determining segregation fund success in the Malaysian P2P market.

https://doi.org/10.24191/jeeir.v12i1.576

Table 5. Results of short-run estimation coefficient

Dependent variable: ΔlnWhole ARDL (1,2,1,1,4,1)					
Variables	Coefficient	Std. Error	T-stat	Prob	Wald (F-stat)
C	-2.3794	0.2977	-7.9935	0.0000	n/a
Δ (lnPir)	0.0104	0.0415	0.2499	0.8042	1.4976
Δ (lnPir (-1))	-0.1043	0.0402	-2.5942	0.0140**	
Δ (lnLt)	0.1112	0.0561	1.9819	0.0559*	1.9819*
Δ (lnIsz)	-0.1483	0.0356	-4.1607	0.0002***	-4.1607***
Δ (lnBLR)	0.1249	0.5547	0.2252	0.8232	
Δ (lnBLR (-1))	-1.5048	0.6375	-2.3606	0.0243**	0.0559*
Δ (lnBLR (-2))	-0.8291	0.6775	-1.2239	0.2297	
Δ (lnBLR (-3))	-2.3263	0.5739	-4.0534	0.0003***	
Δ (lnInf)	0.0709	0.0463	1.5319	0.1351	1.5319
ECT (-1) *	-0.6745	0.0842	-8.0143	0.0000***	n/a
R^2 =0.8081, F-stat =16.4214***, DW=2.2506					
Dependent variable: ΔlnMfg ARDL (3,1,1,1,1,0)					
C	-4.7304	0.7815	-6.0529	0.0000	n/a
Δ (lnPir)	0.2492	0.1931	1.2908	0.2060	1.2908
Δ (lnLt)	0.5093	0.2114	2.4095	0.0219**	
Δ (lnLt (-1))	0.6965	0.2075	3.3571	0.0020***	2.3683*
Δ (lnLt (-2))	0.3823	0.1962	1.9486	0.0602*	
Δ (lnIsz)	0.2082	0.1269	1.6405	0.1107	3.6028**
Δ (lnIsz(-1))	0.3466	0.1475	2.3508	0.0251**	
Δ (lnBLR)	6.4153	1.6670	3.8484	0.0005***	3.6003***
Δ (lnInf)	-0.3031	0.1776	-1.7062	0.0977*	3.0458*
ECT (-1) *	-0.9771	0.1589	-6.1503	0.0000***	n/a
R^2 =0.7449, F-stat =10.0887***, DW=2.2914					
Dependent variable: ΔlnAgri ARDL (2,0,3,2,3,0)					
C	-8.7487	1.3687	-6.3922	0.0000	n/a
Δ (lnPir)	0.0292	0.1193	0.2447	0.8081	0.2447
Δ (lnLt)	-0.0483	0.1419	-0.3406	0.7354	
Δ (lnLt (-1))	0.6601	0.1655	3.9884	0.0003***	4.0680**
Δ (lnLt (-2))	0.2614	0.1315	1.9875	0.0545*	
Δ (lnIsz)	-0.0081	0.0850	-0.0948	0.9250	2.2630**
Δ (lnIsz(-1))	0.1723	0.0839	2.0542	0.0473**	
Δ (lnBLR)	5.3910	1.3037	4.1351	0.0002***	
Δ (lnBLR (-1))	-4.5809	1.5970	-2.8685	0.0069***	3.2354***
Δ (lnBLR (-2))	-6.2894	1.3576	-4.6328	0.0000***	
Δ (lnInf)	-0.2577	0.1037	-2.4838	0.0178**	5.1786**

https://doi.org/10.24191/jeeir.v12i1.576

ECT (-1) *	-0.6941	0.1082	-6.4144	0.0000***	n/a
R^2 =0.7743, F-stat =14.4119***, DW=2.2647					

Notes: (*) Significance at 10% level, (**) Significance at 5% level, (***) Significance at 1% level

Table 5 presented the result of short-run analysis. For lnWhole, the ECT (-1) value of -0.6745 signifies a significant long-run association, explaining 67.45% of variations in lnWhole P2P lending fundraised. In the short run, lnPir and lnInf show inconsistent effects, while lnLt has a positive significant impact, and lnIsz exhibits an inverse effect. The lnBLR results vary across lags. The Wald test confirms the short-run association of lnLt, lnIsz, and lnBLR, while lnPir and lnInf are insignificant. In the manufacturing sector, the ECT (-1) value of -0.9771 demonstrates a significant long-run association, explaining 97.71% of variations in lnMfg P2P lending fundraised. In the short run, lnPir is insignificant, lnLt exhibits consistent positive effects, and investment size has varying effects. lnBLR and lnInf show mixed effects. The Wald test confirms the short-run association of all variables except lnPir. For lnAgri, the lagged ECT coefficient confirms a significant long-run association, explaining 69.41% of variations in lnPir, lnLt, lnIsz, lnBLR, and lnInf towards P2P agriculture, forestry, and fishing. In the short run, lnPir is insignificant, lnLt exhibits inconsistent effects, lnBLR shows varying effects, and lnInf has a significant negative impact. The Wald test confirms the short-run association of lnLt, lnIsz, lnBLR, and lnInf with lnAgri.

4.4 Robustness check

This study utilizes dynamic OLS (DOLS) instead of fully modified OLS (FMOLS) to validate the robustness of the ARDL long-run estimates. DOLS betters the FMOLS method due to its computational simplicity, superior bias reduction, and a t-statistic that better approximates the standard normal density compared to OLS or FMOLS (Kao & Chiang, 2001). DOLS estimators are fully parametric, eliminating the need for pre-estimation and non-parametric correction. In addition, Ali et al. (2017) highlighted that DOLS's key advantage lies in its consideration of the mixed order of integration of variables within the cointegration framework.

Table 6. Results on robust check

lnWhole	ARDL model		DOLS model	
Variables	Coefficient	Prob	Coefficient	Prob
lnPir	0.0358	0.7779	0.11398	0.4761
lnLt	-0.0838	0.5596	-0.0324	0.8277
lnIsz	-0.0189	0.7177	0.0956	0.1024
lnBLR	1.5163	0.0860*	-1.5523	0.0266**
lnInf	-0.0418	0.5783	-0.1495	0.0839
@Trend	0.0165	0.0000	4.4568	0.0119
lnMfg	ARDL model		DOLS model	
Variables	Coefficient	Prob	Coefficient	Prob
lnPir	0.2550	0.2693	0.3982	0.2325
lnLt	-0.7739	0.0882*	-0.4842	0.1093
lnIsz	-0.3552	0.0033***	-0.2404	0.0757*
lnBLR	2.5719	0.1179	1.8516	0.2153
lnInf	-0.2991	0.0646*	0.3505	0.0667*
@Trend	0.0481	0.0000	0.0457	0.0000
lnAgr	ARDL model		DOLS model	

https://doi.org/10.24191/jeeir.v12i1.576

Variables	Coefficient	Prob	Coefficient	Prob
lnPir	0.0421	0.8079	-0.2355	0.8627
lnLt	-1.3844	0.0018***	0.1110	0.1122
lnIsz	-0.2483	0.0233**	-0.0795	0.0025*
lnBLR	5.5114	0.0012***	0.0988	0.0301**
lnInf	-0.3712	0.0056***	0.0332	0.0018*
@Trend	0.0333	0.0000	0.0125	0.0000

Notes: (*) Significance at 10% level, (**) Significance at 5% level, (***) Significance at 1% level

As shown in Table 6, the results from DOLS align with the ARDL long-run estimates, showcasing identical coefficients and probability values respectively. The robustness test confirms that loan approval in P2P lending derives by a different key point of information within the sectors involved. Contradict with findings in Ofir et al., (2022), the current study highlighted that the platform interest rates did not significantly influence the lending approval in P2P lending across the sectors. As the economic condition deteriorate due to the pandemic crisis of COVID-19 covered in the current study has proven than the BLR and inflation has led to the increasing in the P2P lending successfulness. In a short run, results evidently highlighted that the economic activity within the P2P market is still active since the key indicators such as loan tenure, investment size, changes in BLR and inflation influenced the wholesale, retail and trade, manufacturing, and agriculture, forestry, and fishing sectors within the analysis period. Consistently, the short run findings show the impact of 'off-platform' effects in fast response of the borrower in searching for the alternative financing supporting the economic instability theory by Ibrahim and Shah, (2012), also supported by the empirical research by Chin et al., (2021); Lee and Megargel, (2021); Wong and Eng, (2019) and Yang et al., (2016). The current study perspective on key factor of loan tenure has only proved in lnAgr ARDL model aligns with Khan and Xuan, (2021) which add to the idea of signaling information to the loan approval. Therefore, the current study findings confirmed the key factors of loan approval segmented by sectors were different respectively in managing the information asymmetry issue where, each sector derived a significant different ECT (-1) convergence to the equilibrium in the long run.

4.5 Diagnostic test

Finally, a test was conducted to assess the stability of the parameters. To achieve this objective, the normality, Serial LM test, ARCH, RAMSEY test, and CUSUM and CUSUM square graphs were constructed by the sectors respectively. Results in Table 5 show all models are accurate, passed the serial correlation test, and no existence of misspecification.

Table 7. Results of ARDL diagnostic test.

Test	lnWhole		InMfg		lnAgri	
	F-stat	Prob.	F-stat	Prob.	F-stat	Prob.
χ^2NORMAL	1.7763	0.4114	1.3894	0.4992	3.9529	0.1386
χ^2SERIAL $LM_{(2)}$	0.9303	0.6281	5.0271	0.0810	4.9005	0.0863
χ^2 $ARCH_{(1)}$	0.0765	0.6872	1.1991	0.2735	0.3276	0.5671
χ^2RAMSEY $_{(1)}$	1.7371	0.0920	0.0588	0.9535	1.2155	0.2310

Notes: Normal is the Jarque-Bera test; Serial LM () is the LM test for autocorrelation error up to parentheses lag order; an ARCH test is the heteroskedasticity up to given parentheses; and Ramsey is the misspecification test up to given parentheses.

Additionally, as depicted in Figure 2, 3 and 4 it was discovered that the CUSUM of all models falls inside the region that is delimited by the two crucial lines based on a significance level of 5%. The CUSUM for the model on agriculture, forestry, and fishing to be considered as stabled because even though the

plotted result is exceeded the red lines however it then goes back to within the critical bound model immediately until the end of the tested period.

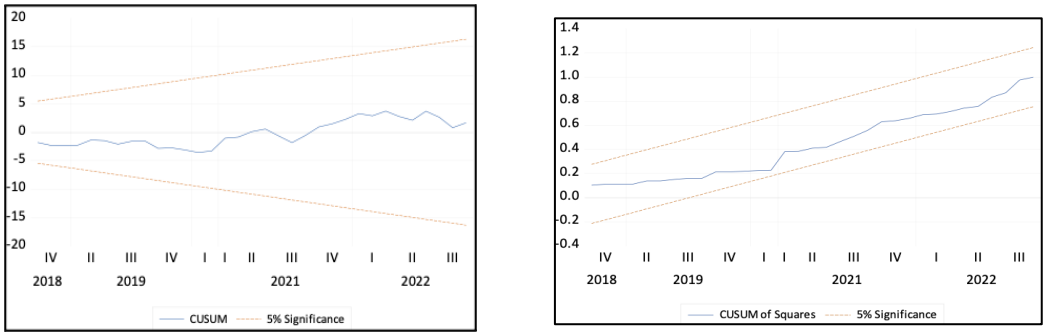

Figure 2. Results of CUSUM (left) and CUSUM of Squares (right) on Wholesale, Retail and Trade sector.

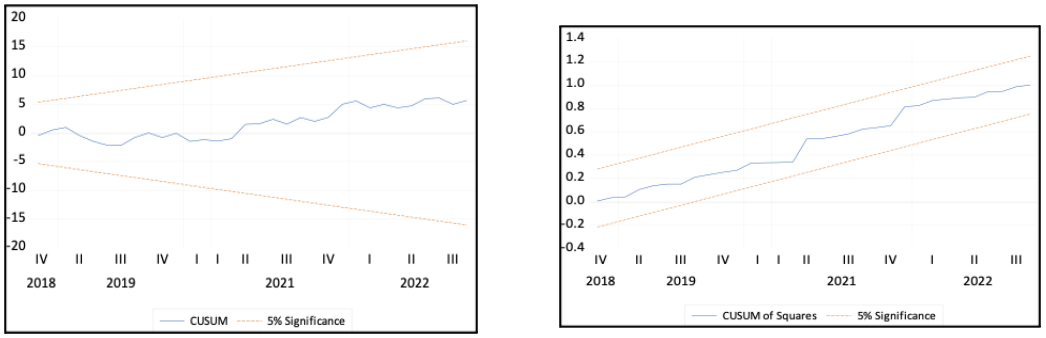

Figure 3. Results of CUSUM (left) and CUSUM of Squares (right) on Manufacturing sector.

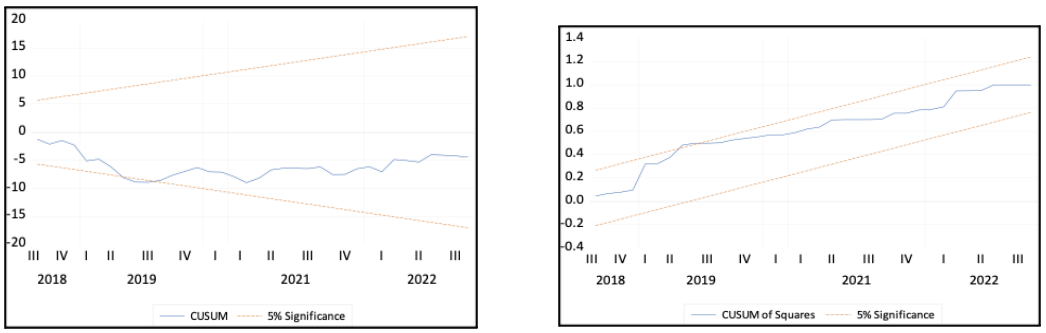

Figure 4. Results of CUSUM (left) and CUSUM of Squares (right) on Agriculture, Fishing, and Forestry sector.

5. Implications and conclusion

In conclusion, this study unveils findings that significantly contribute to signaling criteria by revealing the existence of a long-run causal relationship across all the models examined. Notably, in the short run,

the wholesale sector exhibits sensitivity to loan tenure, investment size, and BLR, while the manufacturing and agriculture sectors are influenced by loan tenure, investment size, BLR, and inflation in shaping P2P lending dynamics within their respective domains. These findings carry substantial implications for industry participants, providing valuable insights into the factors influencing P2P lending success. For industry stakeholders, understanding the nuanced impact of key factors such as platform interest rate, loan tenure, investment size, BLR and inflation dynamics within each sector enables tailored strategies to enhance market performance.

This research makes a significant contribution to the existing body of literature on FinTech lending, specifically focusing on the approval of business loans in Malaysia's P2P lending sector. It investigates the factors influencing the success of P2P lending and their short- and long-term implications, addressing gaps in understanding the relationship between platform information, economic indicators, and successful fundraising in various sectors. Through a comprehensive model, the study reveals valuable insights into key factors such as platform interest rates, loan tenure, investment size, BLR, and inflation, expanding theoretical understanding by illustrating their impact on loan approval within Malaysia's P2P market. This aligns with Akerlof's theory of information asymmetry and Minsky's theory of financial instability, offering insights that have not been extensively explored previously.

The practical implications of this study are profound, providing guidance for P2P platforms to refine strategies, manage risks, develop products, and plan for the long term based on these influential factors. Additionally, these findings offer valuable intuitions for industries to align their approaches, mitigate risks, comply with regulatory standards, and stand out in the competitive P2P market according to the sectors respectively. Regulators can also benefit from these insights by establishing standardized practices, promoting transparency, reducing risks, and educating investors, thereby fostering a more secure and transparent environment for P2P lending. Moreover, as a suggestion for future research, expanding the scope to include variables like credit scoring and exploring additional industry types would further enrich our understanding of the multifaceted dynamics within the P2P lending approval landscape.

Acknowledgement

This study received support through a scholarship from the Ministry of Higher Education Malaysia (MoHE) under Skim Latihan Akademik Bumiputera (SLAB). The data utilized in the analysis were generously provided by the Securities Commission of Malaysia. Additionally, the Department of Postgraduates and Professional Studies (DPPS) under the Faculty of Business and Administration (FBM) in Shah Alam, Selangor, Malaysia, contributed to the support for this research.

Conflict of interest statement

The authors affirm that this research was conducted without any perceived personal, financial, or commercial gains that could pose conflicts of interest. Additionally, there are no conflicting interests between the authors and the funders involved in this study.

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Nur'Asyiqin Ramdhan handled research execution, data organization, and formal analysis. Imbarine Bujang Amirul Afif Muhamat devised the study concept, oversaw its development, and contributed to the methodology section of the article. Erni Hendrawaty and Tay Bee Hoong led the review process, ensuring revisions, and endorsed the article for submission. All authors have reviewed and consented to the final published version of the manuscript.