UNRAVELLING THE DIVERGENT EFFECTS OF PLATFORM INTEREST RATES IN P2P LENDING: A SEGREGATION APPROACH

NUR'ASYIQIN RAMDHAN[1], IMBARINE BUJANG[2] AND AMIRUL AFIF MUHAMAT[1]

[1]Faculty of Business and Management, Universiti Teknologi MARA, Puncak Alam Branch, 42300 Puncak Alam, Selangor, Malaysia. [2]Faculty of Business and Management, Universiti Teknologi MARA, Sabah Branch, 88997 Kota Kinabalu, Sabah, Malaysia.

*Corresponding author: imbar074@uitm.edu.my

Abstract: This article explores the impact of platform interest rates on financing types of peer-to-peer (P2P) lending over both long- and short-term durations. The study examines whether platform interest rates play a pivotal role in shaping the financing preferences of participants in the segregation of invoices and microfinancing. By employing autoregressive distributed lag analysis on data from 2017 to 2022, the study reveals compelling mixed evidence. The results indicate a significant influence of platform interest rates on the segregation of financing types in microfinancing. However, an insignificant influence was detected for invoice financing in both time frames. These findings underscore the short and long-term context of the P2P product offered. The study contributes valuable insights into the intricate interplay between platform interest rates and diverse financing choices, enhancing the understanding of P2P market players among fintech lending platforms.

Keywords: Fintech, P2P lending, microfinancing, invoice financing, ARDL.

Introduction

The emergence of peer-to-peer (P2P) lending has revolutionised the financial landscape by offering a decentralised alternative to traditional lending institutions. P2P platforms act as intermediaries, connecting borrowers seeking funding with individual investors willing to provide capital. The role of interest rates in shaping lending dynamics cannot be understated. Platform interest rates serve as a crucial determinant influencing borrowers' decisions and investors' lending choices within the P2P lending ecosystem. As the P2P lending sector continues to expand, the relationship between platform interest rates and lending outcomes warrants comprehensive examination.

In recent years, there has been notable growth in the P2P lending sector in Malaysia, resulting in a diverse array of platforms available for investors to consider. Malaysia's approach to P2P lending diverges from other ASEAN countries due to the establishment of legislation prior to market operations. Unlike the online P2P lending industry in the United States and Europe, Malaysian platforms are primarily structured to extend credit to small businesses rather than individual borrowers. Despite the regulatory advantages, issues related to information asymmetry remain significant in the P2P lending landscape, particularly concerning the transparency of borrower information. The decentralised nature of P2P lending platforms can lead to situations where borrowers may provide incomplete, inaccurate, or even intentionally misleading information to lenders. The relationship between types of financing in P2P lending and information asymmetry is significant and intertwined. In this context, it pertains to the unequal access to information between lenders (investors) and borrowers. The nature of P2P lending platforms and the costs of borrowing, depending on the products offered, can either mitigate or exacerbate this information asymmetry.

The empirical analysis conducted in this research aims to shed light on the elaborate interplay between platform interest rates and other control variables such as platform capital allocation, loan duration, bank loan interest rates, and inflation, with respect to the segregation of P2P financing types offered in

Malaysia. By employing a segregation approach, this study seeks to discern the nuanced effects that platform interest rates exert on different borrowing categories, thereby contributing to a more detailed understanding of the mechanisms that drive P2P lending. As the P2P lending landscape continues to evolve, exploring the effects of platform interest rates becomes imperative for both investors and borrowers navigating this dynamic financial ecosystem. This article endeavours to fill this knowledge gap and provide valuable insights into the role of interest rates within the P2P lending paradigm.

Literature Review

Variations in motivations behind seeking financing on P2P lending platforms result in a diverse array of loan types based on specific purposes. Lending platforms in Europe, exemplified by the Lending Club, offer borrowers 13 distinct loan categories, encompassing purposes such as debt consolidation, credit card debt, home renovation, automobile acquisition, housing, major purchases, healthcare expenses, relocation, sustainable projects, small business ventures, vacations, and other activities (Möllenkamp, 2017). Conversely, countries such as Indonesia and Singapore provide three to four distinct business financing options within their P2P lending platforms (Yunus, 2019).

The rationale behind borrowing significantly influences how issuers source capital from investors, explaining why individuals engage in lending activities. Notably, those lending for economic objectives intend to yield profit and anticipate a reasonable return on their investment (Wang *et al*., 2009). These investors perceive P2P lending as a form of securities, viewing it as an alternate investment avenue. Their selection of borrowers and loans hinges upon the perceived risk and potential reward. The types of financing affect numerous elements of the loan process, including borrower selection, risk tolerance, and the determination of interest rates.

Research underscores the influence of loan purposes on the success of lending through P2P platforms (Carmichael, 2014; Mach *et al*., 2014; Serrano-Cinca *et al*., 2015). Notably, loan purposes serve as determinants of lending success, impacting lenders' choices. For instance, commercial loans exhibit higher interest rates and lower success rates compared with debt consolidation loans (Chen & Han, 2012). This phenomenon is evident among borrowers on the United States and United Kingdom P2P lending platforms, where microfinancing is sought for a range of purposes (Möllenkamp, 2017). Hence, investors can select unsecured loans based on factors such as borrower attributes and loan specifics with the option to finance a percentage of the total loan amount. However, empirical literature directly examining the impact of platform interest rates on P2P financing types is scarce, as most studies generally benchmark a variety of P2P loans without segregation.

The significance of interest rates within P2P platforms lies in their role as indicators of subsequent outcomes for successful loans (Serrano-Cinca *et al.,* 2015; Canfield, 2018; Filar, 2020; Nigmonov *et al*., 2021). Research conducted by Debreu (1960) analysed lender trust characteristics, using interest rates as a proxy for trust levels, revealing that sharing personal information enhances lenders' confidence. This suggests that attempts to elicit sympathy through lending information may result in higher interest rates, indicating a lack of lender confidence.

Additionally, evidence shows that platform interest rates follow a unique U-shaped pattern (Yan *et al*., 2018). When interest rates are moderate, more investors are attracted, leading to positive investment decisions. However, if interest rates become too high, they may discourage investors, making it difficult for platforms with elevated rates to gain their trust. The likelihood of loan default is closely linked to the interest rates set by the platform, as higher interest rates often indicate higher default probabilities (Filar, 2020). Borrowers facing substantial interest obligations on their

loans are often perceived as posing a greater risk of bankruptcy, establishing a clear connection between default tendencies and interest rates. This risk factor necessitates compensatory higher borrowing interest rates.

Moreover, elevated interest rates on loans serve as a safeguard against potential interest rate increases set by central banks, which can fluctuate over time. A significant finding by Canfield (2018) emphasises that interest rates assigned to loans play a role in controlling loan quality, as represented by credit ratings. This implies that borrowers offered higher interest rates may be subject to this control mechanism, aiming to mitigate the elevated probability of default in lending. Many markets provide users access to databases containing historical loan project information, including lending costs and repayment histories. Investors can utilise these information sources to assess individual default risks. However, this task is hindered by insufficient knowledge and preconceived notions. Often, individuals base their conclusions on limited essential data rather than analysing a comprehensive array of factors (Shanteau, 1992; Gigerenzer, 2007).

The diverse elements of platform lending rates exert a range of impacts on lenders' investment returns. This differentiation provides an opportunity for a study to contrast the two mechanisms, as established by Wei and Lin (2016). P2P providers that adopt published pricing mechanisms generally exhibit higher overall loan volumes while platforms employing bidding methods tend to impose a ceiling on maximum loan quantity. The prevailing lending rate model in the Malaysian market is the published pricing coupled with a straightforward interest rate. This rate is intuitively calculated as a predetermined percentage, excluding compounding periods.

In contrast, the effective interest rate accounts for compounding periods, resulting in a typically higher lending rate compared with the simple interest rate at the conclusion of the loan period (Salam, 2021). The provision of online lending has streamlined access to the capital market, catering to the funding needs of potential market participants by addressing both the supply and demand aspects. The choice of marketplace strategies aimed at aligning funding needs and desires is interconnected with the parameters (cost) governing the course of exchanges. This is a pivotal and frequently debated topic in this evolving industry. Despite numerous articles comparing the performances of the two methods, only a limited number have explored the factors influencing mechanism selection. This investigation could yield insightful new perspectives for the industry (Lu et al., 2022).

Additionally, the influence of interest rates set by the lending platform holds substantial significance in shaping loan performance. The determination of platform lending rates is recognised as a robust predictor of loan outcomes in P2P lending (Zhang et al., 2017). Puro et al. (2010) discovered that a lower rate reduces the likelihood of loan approval for borrowers; however, a reduced loan amount increases the likelihood of success. Simultaneously, when lending platforms impose reasonable interest rates for borrowers, the likelihood of successful funding also increases.

Empirical research indicates that investors exhibit a preference for applications offering higher interest rates due to the inherent nature of the investment process. This suggests that elevated interest rates serve as a strong signal that borrowers anticipate their offers will attract enough depositors, consequently leading to a reduction in the proposed interest rate. Moreover, an intriguing psychological insight arises from the concept of risk aversion, suggesting that higher investments are associated with increased investor risk. Paradoxically, actual data demonstrate that higher interest rates correlate positively with funding likelihood. This finding aligns with previous research highlighted by Freedman and Jin (2008), Barasinska (2011), Pope and Sydnor (2011), Ravina (2011), Sonenshein et al. (2011), Gavurova et al. (2018), and Herzenstein et al. (2018).

Methodology

Data

Data for this study was collected from several sources. Information regarding registered P2P lending markets was exclusively accessed through the Securities Commission (SC) annual reports from 2017 to the current year. The study primarily sourced its data from the SC, the central bank's website and P2P platforms, encompassing a comprehensive sample of the Malaysian market, except for platform interest rate information. To acquire monthly average platform interest rate data specific to P2P lending, the study selected listed P2P platforms operational in Malaysia. Up to December 2021, there were 11 authorised P2P lending platforms in Malaysia (Fintech News, 2021). Among these, 11 platforms were included: CapSphere, MicroLEAP, Cofundr, Money Save, Fundaztic, QuicKash, AlixCo, Nusa Kapital, Funding Societies, CapBay, and B2B FinPal.

The study employed a monthly sampling timeframe commencing from January 2017 to September 2022, resulting in 69 months of observation. This chosen period encompassed the complete operational span of P2P platforms following the registration approval of the initial six Malaysian P2P lending platforms in April 2016. The platform interest rates variable in this study was measured through the lending rates presented by the platforms for loans extended to borrowers (Möllenkamp, 2017; Filar, 2020). The monthly data provided by the SC pertained to the weighted average simple interest rate expressed as a percentage while the segregated financing types were proxied by the total value

in Malaysian Ringgit (RM) of P2P funds raised by: (i) Invoice financing and (ii) Microfinancing.

Estimation Model

The research employed the autoregressive distributed lag (ARDL) bounds test model for two main reasons. Firstly, the model was selected to assess the comprehensive impact of both the duration effects between platform interest rates and the segregation of financing types in successfully funded P2P campaigns. This approach aims to introduce a novel model specification that accounts for duration effects, particularly relevant to the emergence of P2P platforms in Malaysia. Secondly, the adoption of the ARDL method was driven by the limited sample size available. Malaysia's P2P platforms commenced operations in 2017 and the dataset for this study covers monthly statistics until 2022, comprising 69 observations. Given this sample size, the ARDL bounds test results were considered more robust and suitable, aligning with its capacity to perform well with small data samples (Pesaran *et al*., 2001).

The core objective of this investigation is to assess a choice of financing types that could impact the enduring relationship with P2P fundraising, encompassing both short-term and long-term perspectives. The collected data were monthly and segregated into two specific financing types: (i) Microfinancing and (ii) Invoice financing. The ARDL estimation was analysed through the following equation:

$$
\begin{aligned}
P2P_{i,t} = {} & \alpha + \beta_0 P2P_{i,t-1} + \beta_1 Pir_{t-1} + \beta_2 DL_{t-1} + \beta_3 PCA_{t-1} + \sum_{i=1}^{p-1} \theta_i \Delta P2P_{i,t-1} + \sum_{i=1}^{q-1} \theta_i \Delta Pir_{t-1} \\
& + \sum_{i=1}^{r-1} \theta_i \Delta DL_{t-1} + \sum_{i=1}^{s-1} \theta_i \Delta PCA_{t-1} + \sum_{i=1}^{t-1} \theta_i \Delta Bir_{t-1} + \sum_{i=1}^{u-1} \theta_i \Delta INF_{t-1} + \varepsilon_t
\end{aligned}
\tag{1}
$$

where, $P2P_{i,t}$ represents the successful P2P lending for financing type i, over time of t, $Pir_{i,t}$ denotes the platform interest rates over a time of t, DL_t signifies the duration of loan over time of

t, and PCA_t is platform capital allocation over a time of t. Additionally, Bir_t is the bank loan interest rate over time of t, $INF_{i,t}$ is the inflation rate over time of t and ε_t is the error term and

lag order. Prior to estimating the ARDL model, preliminary investigations on the collected data were completed to prepare for ARDL analysis. Next, diagnostic analysis for parameter stability using cumulative sum (CUSUM) and CUSUM squared tests was conducted.

Results

The findings highlighted three main analyses: The estimation of cointegration, the long-term, and short-term influences of the variables. The ARDL estimation results for the segregation types of financing are presented in Table 1.

The result for invoice financing (Invf) revealed a computed F-statistic of 4.0435, based on a sample size of n = 45. A comparison between the computed f-statistic and the critical values of the bound test for n = 45 indicated that this value exceeded the upper bound test value of 3.739 at a 90% confidence level, confirming the presence of cointegration between the model specification and the successful P2P fundraising for invoice financing. In contrast, the model pertaining to microfinancing (Microf) demonstrated an F-statistic value of 5.7348, derived from a sample size of n = 68. This value surpassed both the upper and lower bounds for n = 70 at a 99% significance level, which are 3.966 and 5.234, respectively. The Microf model suggests the identification of long-term cointegration among the variables from 2017 to 2022. This, both segregations are confirmed to

be cointegrated, allowing for further analysis of long- and short-run relationships.

Table 2 presents the segregation results for long-term estimation for both types of financing. In the case of invoice financing, the analysis revealed that only the bank interest rate (lnBIR) was significant, displaying a negative long-term association. The platform interest rates exhibited a negative coefficient of -0.1676 but did not demonstrate a significant long-term relationship with P2P loans in invoice financing. Other variables, including the duration of loan (lnDL), platform capital allocation (lnPCA), and inflation (lnInf) had coefficients of 0.0997, -0.0589, and 0.0051, respectively. However, these variables were found to be insignificant concerning the overall approved campaigns in invoice financing.

The long-term coefficients for microfinancing revealed significant relationships for three variables. Notably, platform interest rates exhibited a negative coefficient, indicating that an increase in lnPir would lead to a decrease in total P2P lending campaigns in lnMicrof by 3.4132, with a significance level of 1%. Additionally, the results for lnBLR and lnInf confirmed their positive and meaningful connections with coefficient values of 2.7145 and 0.3185 at the 1% and 10% significance levels, respectively. However, the remaining variables, lnDL and lnPCA did not show any noteworthy long-term impact on the microfinancing segregation.

Table 1: Results of cointegration test

| k = 5 | n | 90% | | 95% | | 99% | |
Trend		I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
Case 4: Unrestricted intercept and restricted trend	45	2.750	3.739	3.211	4.309	3.500	4.630
	70	2.631	3.589	3.043	4.100	3.966	5.234
Actual n	Segregation by Type of P2P Financing				Computed F-statistics		
45	Invf				4.0435 *		
68	Microf				5.7348 ***		

Notes: Invf refers to invoice financing, Microf referes to microfinancing in P2P lending. (***) (**) (*) Cointegrated at the critical values with 99%, 95%, and 90%. I(0) represents the lower bound of F-bound test critical values, I(1) represents the upper bound of F-bound test critical values adapted from Narayan (2005).

Table 2: Results of long run estimation

Types of Financing	Variables	Coefficient	Std. Error	T-stat	Prob.
Invf	lnPir	-0.1676	0.1501	-1.1166	0.2728
	lnDL	0.0997	0.2186	0.4558	0.6517
	lnPCA	-0.0589	0.0686	-0.8585	0.3972
	lnBIR	-1.8621	1.0238	-1.8188	0.0786*
	lnInf	0.0051	0.0962	0.0528	0.9582
	@Trend	0.0102	0.0056	1.8020	0.0813
Microf	lnPir	-3.4132	1.1116	-3.0706	0.0032***
	lnDL	0.1107	0.0737	1.5022	0.1385
	lnPCA	0.2286	0.1832	1.2481	0.2170
	lnBIR	2.7145	0.9019	3.0098	0.0039***
	lnInf	0.3185	0.1882	1.6922	0.0960*
	@Trend	0.2242	0.0423	5.3058	0.0000

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

Furthermore, the short-run estimation presented in Table 3 indicates the coefficient of the lagged Error Correction Term (ECT). For invoice financing, a significant negative sign at the 1% level aligns with the results from the cointegration bound test. The validated ECT value of -0.6914 confirms that the adjustment speed of variables towards P2P invoice

Table 3: Results of short run estimation

Types of Financing	Variables	Coefficient	Std. Error	T-stat	Prob.
Invf	C	-17.116	1.5918	-10.7524	0.0000
	Δ (lnPir)	0.0250	0.0610	0.4096	0.6850
	Δ (lnDL)	0.1912	0.0882	2.1676	0.0380**
	Δ (lnPCA)	0.0681	0.0527	1.2908	0.2063
	Δ (lnBIR)	2.9205	0.9794	2.9819	0.0055***
	Δ (lnInf)	0.0035	0.0663	0.0529	0.9581
	ECT (-1) *	-0.6914	0.1189	-5.8123	0.0000***
	R^2 = 0.7062, F-stat = 12.7027***, Durbin Watson = 2.9867				
Microf	C	-10.7993	1.6658	-6.4831	0.0000
	Δ (lnPir)	-0.8463	0.4052	-2.0886	0.0411**
	Δ (lnDL)	0.0648	0.0435	1.4873	0.1423
	Δ (lnPCA)	0.1338	0.1045	1.2796	0.2058
	Δ (lnBIR)	1.5883	0.6181	2.5697	0.0128**
	Δ (lnInf)	0.8600	0.1798	4.7829	0.0000***
	ECT (-1) *	-0.5851	0.0879	-6.6555	0.0000***
	R^2 = 0.4820, F-stat = 19.8469***, Durbin Watson = 2.1304				

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

financing is moderately paced at 69.14% in the subsequent month. The short-term estimation for the invoice financing classification highlights two significant variables, yielding an R-squared value of 70.62%.

The positive and significant short-term effects from lnDL and lnBIR have coefficients of 0.1912 and 2.9205, respectively. However, platform interest rates, platform capital allocation and inflation showed insignificant short-term effects on the coefficient. Moving to microfinancing segregation, all independent variables had a moderate impact, confirming the long-term cointegration observed in the bounds test. The lagged ECT value of -0.5851 indicated a speed of adjustment by 58.51% towards equilibrium in the following month. In the short-term analysis, three variables significantly affect microfinancing's successful P2P lending. Platform interest rates had a negative short-term effect, indicating that an increase in lnPir leads to a decrease in successful microfinancing campaigns, with the overall R-squared for this model is 48.20%.

Finally, a test was conducted to assess the stability of the parameters. To achieve this, CUSUM and CUSUM squared graphs were constructed following the approach outlined by Brown *et al.* (1975), as depicted in Figures 1 and 2. The plots show that both tests for the respective segregation fall within the critical boundaries, indicating that all the estimation coefficients are robust and stable.

Discussions

The findings affirmed that invoice financing in P2P lending insignificantly affects the success of fund lending while microfinancing significantly contributes to the success of fundraised P2P loans. These divergent effects of platform interest rates on P2P lending financing types underscore the importance of product variety and its associated risk implications. Risk profiles play a fundamental role in determining how platform interest rates respond to different types of P2P financing. Three reasons explain of the differing effects on platform interest rates. First, this study confirms that platform
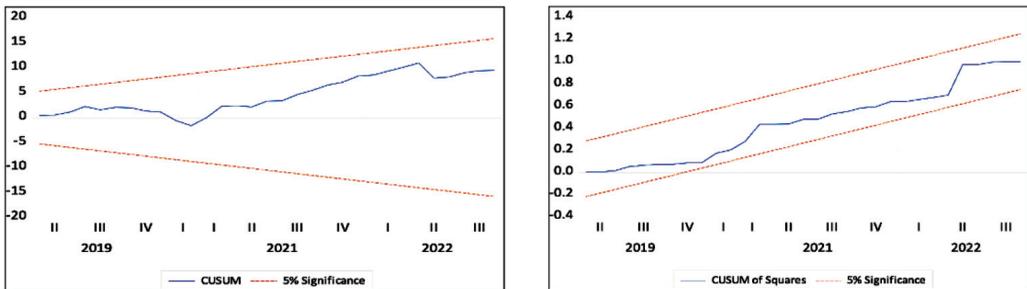

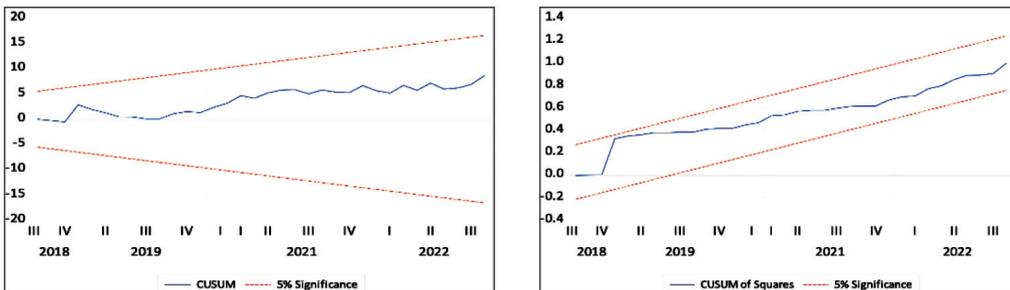Figure 1: Plot of CUSUM and CUSUM of square for invoice financing

Figure 2: Plot of CUSUM and CUSUM of square for microfinancing

interest rates react to product risk profiles. The varying risk profiles of microfinancing and invoice financing within P2P platforms arise from distinct borrower characteristics and the collateral involved. Microfinancing, often extended to individuals or small businesses lacking substantial credit history or collateral, carries a higher risk due to the increased potential for defaults arising from economic instability or limited financial stability. Consequently, lenders offset this risk by charging higher interest rates to ensure a compensatory return.

In contrast, invoice financing uses invoices from established businesses as collateral, mitigating risk for lenders and resulting in a less significant effect on interest rates compared with microfinancing. This discrepancy in risk drives the variance in interest rates between these P2P financing types with the presence or absence of collateral and borrower financial stability being key factors. Secondly, the nature of the product's business model with the presence of underlying assets or collateral, significantly influences the divergent effects of platform interest rates. Invoice financing operates by leveraging invoices owed by reputable businesses as collateral, offering an important layer of security for lenders. These invoices represent forthcoming payments due from established companies for goods or services rendered, reducing the lending risk. This collateralisation minimises uncertainty for lenders by providing a tangible asset that can be claimed in the event of default, thereby lowering risk exposure. Conversely, microfinancing often involves borrowers with limited credit history or assets, leading to either no collateral or less reliable collateral such as personal belongings or undeveloped business assets.

The absence or inadequacy of solid collateral in microfinancing increases the risk for lenders, often resulting in higher interest rates as a safeguard against the higher probability of default and the difficulty in recovering funds in case of non-payment. This difference in collateral quality and availability significantly influences the interest rates charged in microfinancing compared with invoice financing, which offers more reliable collateral in the form of invoices.

Finally, in the highly competitive P2P lending market, changes in platform interest rates have a minimal impact on lender and borrower behaviour or the total funds raised. Investors no longer solely seek high rates; they demand more diversified offerings from platforms (Yan *et al*., 2018). Platforms differentiate themselves through unique rate structures and tailored loan products, preventing the establishment of standardised pricing benchmarks in the fragmented market. Borrower demand for P2P loans is driven by factors beyond interest rates such as speed, ease, higher returns, unaffected credit scores, and flexibility (Wire, 2021). In Malaysia, the demand for alternative financing, including P2P, arose from a substantial funding gap for micro-enterprises and SMEs, pushing borrowers with poor credit, insufficient collateral, and limited documentation to seek alternative funding sources like P2P lending (Rahman & Lee, 2016; Teng, 2019). Despite potentially higher interest rates, borrowers prioritise access to funds over borrowing costs due to the lack of traditional financing options.

The findings of the current research help assess and manage risks associated with P2P lending. The implications for P2P platforms, in particular, suggest refining risk models and strategies by employing targeted risk mitigation tactics, especially in managing platform interest rate exposure. This allows for more effective risk management and reduces potential pitfalls related to aligning product characteristics with borrowing costs. As highlighted by empirical research, platform confidence, maintaining a good reputation against defaults, and the ability to generate new loans are crucial (Käfer, 2018).

In addition, the findings provide valuable guidance for P2P platforms in product development. Platforms can leverage insights into interest rates to improve or create new products that align with the preferences of both investors and borrowers. For example, given the sensitivity of microfinancing to platform interest rates, the platform could develop or

refine products that cater more specifically to user needs. If there is a demand for lower-risk investments with slightly lower returns, platforms might introduce products aimed at attracting more risk-averse investors. This could include adjustable terms, risk diversification options, or niche products tailored to particular sectors or risk appetites based on observed preferences.

Conclusions

The analysis revealed contrasting outcomes regarding the significance of platform interest rates in the microfinancing and invoice financing segments of P2P lending. The findings emphasised the significant long- and short-term influence of platform interest rates on microfinancing. However, interest rates were found to have an insignificant effect on invoice financing over time. This suggests that fluctuations in interest rates can affect microfinancing campaigns, likely due to the unique characteristics of microloans and the sensitivity of small-scale borrowers to changes in interest rates. In contrast, the lack of significance between platform interest rates and invoice financing suggests that factors other than interest rates may play a more crucial role in determining the success of invoice financing campaigns. Invoice financing is likely driven by considerations such as the reliability of invoices and the creditworthiness of businesses, which diminishes the impact of interest rates.

The divergent implications arising from these findings indicate the need for P2P lending platforms to develop targeted strategies for distinct financing types. Recognising the essential role of interest rates in driving microfinancing success, platforms should carefully adjust rates to attract borrowers while maintain investor confidence. In contrast, the lack of impact from interest rates on invoice financing underscores the importance of factors beyond rates. This necessitates platforms prioritise aspects such as invoice reliability and borrower creditworthiness to ensure effective campaigns. Such tailored approaches will assist platforms in optimising lending outcomes by aligning their offerings with the specific requirements of borrowers and the expectations of investors across various financing categories. Future research should explore a broader range of variables such as borrower demographics to investigate investor behaviour. Additionally, longitudinal analysis could provide a more comprehensive understanding of segregated lending dynamics.

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Conflict of Interest Statement

The authors declare that they have no conflict of interest.

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