VOLUME 7 No 2 Nov 2025
E – ISSN: 2620 – 5815
DOI: 10.36985/e7f0ac64

Jurnal Ilmiah AccUsi
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ANALYSIS OF THE INFLUENCE OF FINANCIAL TECHNOLOGY PEER-TO-PEER (P2P) LENDING AND PAYMENT GATEWAY ON THE FINANCIAL PERFORMANCE OF MSMES IN PEMATANGSIANTAR CITY

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ABSTRACT

This study examines the influence of financial technology specifically Peer-to-Peer (P2P) Lending and Payment Gateway services on the financial performance of micro, small, and medium enterprises (MSMEs) operating within the Siantar Square culinary center in Pematangsiantar, Indonesia. Primary data were collected from 32 MSME respondents through a purposive sampling technique using structured questionnaires. The analysis employed validity and reliability tests, normality testing, multiple linear regression, partial t-tests, and simultaneous F-tests to assess the impact of the fintech variables. The findings reveal that P2P Lending does not exert a significant partial effect on MSME financial performance, indicating that digital lending has not yet translated into measurable financial improvement for local businesses. Conversely, Payment Gateway usage demonstrates a positive and significant effect, suggesting that digital payment systems enhance transaction efficiency, cash-flow management, and overall financial performance. The simultaneous F-test further confirms that both fintech variables collectively influence financial outcomes, with Payment Gateway acting as the dominant contributing factor. These results underscore the strategic importance of digital payment adoption, improved digital financial literacy, and supportive digital ecosystems in strengthening MSME financial performance in emerging regional markets.
Keywords: FinTech, P2P Lending, Payment Gateway, Financial Performance, MSMEs.

ABSTRAK

Penelitian ini bertujuan untuk menganalisis pengaruh teknologi keuangan, khususnya P2P Lending dan Payment Gateway, terhadap kinerja keuangan Usaha Mikro, Kecil, dan Menengah (UMKM) yang beroperasi di pusat kuliner Siantar Square, Kota Pematangsiantar. Penelitian ini menggunakan data primer yang diperoleh melalui penyebaran kuesioner kepada 32 pelaku UMKM di sektor kuliner dengan metode purposive sampling. Analisis data dilakukan melalui uji validitas, reliabilitas, normalitas, regresi linear berganda, uji t, dan uji F. Hasil penelitian menunjukkan bahwa secara parsial P2P Lending tidak berpengaruh signifikan terhadap kinerja keuangan UMKM, sedangkan Payment Gateway memiliki pengaruh positif dan signifikan. Namun, secara simultan kedua variabel fintech tersebut berpengaruh signifikan terhadap kinerja keuangan. Hal ini mengindikasikan bahwa penggunaan teknologi pembayaran digital memberikan kontribusi yang lebih dominan dibandingkan pembiayaan digital dalam meningkatkan efisiensi transaksi, arus kas, dan performa keuangan UMKM. Temuan ini menegaskan pentingnya penguatan literasi digital, optimalisasi pemanfaatan fintech, serta dukungan ekosistem digital dalam mendorong peningkatan kinerja keuangan UMKM.
Kata Kunci: Fintech, P2P Lending, Payment Gateway, Kinerja Keuangan, UMKM

I. INTRODUCTION

The rapid development of information and communication technology over the past two decades has fundamentally transformed various aspects of human life, including the global financial system. One of the most significant impacts of digital innovation is the shift in financial transaction models, which historically required physical interaction, paper based administration, and lengthy processing times.

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These processes have now transitioned into automated and interconnected digital systems. Borrowing and lending activities that previously required physical presence and printed documentation can now be completed online through smartphones, laptops, or tablets using only digital identification and internet connectivity. This transformation has paved the way for new financing models such as peer-to-peer lending (P2P lending), a platform that enables borrowers to obtain funds directly from lenders without traditional banking intermediaries.

P2P lending has emerged as a major innovation in digital finance because it expands access to credit and accelerates loan processes that were traditionally complex and time consuming. At the same time, financial technology (fintech) has advanced rapidly as a broader framework for digital financial innovation. The growth of fintech is driven by the inability of conventional financial systems to adequately meet the needs of a digital oriented society. Fintech enables various financial transactions including payments, fund transfers, loan applications, and investments to be conducted digitally, efficiently, and at lower operational costs than traditional systems (Lee & Shin, 2018).

Fintech has reshaped how financial institutions operate by offering services that previously required high administrative costs and complex procedures. Technologies such as machine learning, big data analytics, and cloud computing have enabled more accurate and efficient verification and risk assessment processes. These technologies allow creditworthiness evaluations to be performed automatically with high levels of precision, thereby expediting lending decisions. This supports the findings of Zavolokina et al. (2024), who argue that digital financial intermediation enhances financing efficiency and reduces information asymmetry between lenders and borrowers.

In addition to P2P lending, payment gateway systems have become widely adopted among consumers and businesses. Payment gateways facilitate digital, real-time transactions by connecting buyers and sellers across geographical boundaries. These systems improve transaction accuracy, simplify financial recordkeeping, and reduce the risk of manual errors. Al-Qudah and Al-Okaily (2023) demonstrate that payment gateway adoption significantly improves the transaction performance of micro, small, and medium enterprises (MSMEs) and enhances their participation in broader digital markets.

Fintech plays a particularly important role in the MSME sector. MSMEs form the backbone of Indonesia's economy, contributing more than 61% to national GDP and employing approximately 97% of the workforce. Despite their substantial contribution, many MSMEs face difficulties accessing formal financing due to limited collateral, low financial literacy, incomplete credit histories, and complex administrative procedures. Fintech offers a more inclusive, faster, and flexible financing alternative. Sholihah et al. (2021) emphasize that fintech expands MSMEs' access to capital by providing simpler loan application processes compared to traditional banks.

International studies reinforce these findings. Chen et al. (2023) report that digital finance through P2P lending enhances MSME financial performance by improving access to working capital and accelerating financing processes. Wang and He (2022) similarly conclude that fintech credit contributes to MSME growth by enabling business expansion, increasing production capacity, and supporting product innovation. Licciardi et al. (2021) highlight that MSMEs with stronger digital adaptation capabilities demonstrate greater financial resilience, especially during crises such as the COVID-19 pandemic.

The digitalization of lending through P2P platforms has become increasingly essential because it eliminates traditional procedural bottlenecks, allowing borrowers to access credit without lengthy verification or waiting periods. Operating under a "borrower meets lender" model, these platforms function as digital intermediaries that reduce operational costs and accelerate financial intermediation. Barua (2020) notes that fintech increases financial inclusion by offering more accessible financing pathways for low income populations and small-scale entrepreneurs.

Fintech adoption also influences MSME behavior. The use of digital payment systems encourages MSMEs to transition toward digital financial recordkeeping, adopt structured accounting practices, and broaden their market outreach through e-commerce platforms. Banna and Alam (2023)

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find that fintech enhances MSMEs' financial sustainability by improving working capital management and stabilizing cash flows.

In practice, many MSMEs have accelerated their business growth through fintech adoption. Fintech not only provides access to capital but also offers tools for transaction monitoring, cash flow analysis, and data driven expense management. These findings align with Di Tella and Nair (2020), who show that digital financing significantly improves productivity among MSMEs in the trade and services sectors.

Despite these advantages, several research gaps remain. First, most studies focus on fintech adoption in major urban areas such as Jakarta, Surabaya, and Bandung resulting in limited insights into medium sized or smaller cities like Pematangsiantar, which have different MSME characteristics in terms of financial literacy, business scale, and cost structure. Second, existing research often examines fintech broadly rather than analyzing the combined effects of P2P lending and payment gateway usage, even though these two fintech components are the most widely utilized by MSMEs. Third, many studies rely primarily on perceptual indicators rather than empirical financial measures such as profitability, liquidity, and working capital turnover. Fourth, there remains a limited understanding of the long-term effects of fintech adoption on MSME financial stability, even though business sustainability is strongly influenced by consistent digital integration.

Against this backdrop, the present study is particularly relevant for understanding fintech's impact on MSME financial performance in Pematangsiantar. As a developing economic hub in North Sumatra with significant MSME growth but limited formal banking access compared to larger urban centers, Pematangsiantar serves as an appropriate context for examining how fintech particularly P2P lending affects MSME financial outcomes. This study is expected to contribute empirical evidence to the existing literature and offer policy recommendations for local governments, MSME actors, and fintech service providers**.**

II. THEORETICAL OVERVIEW

Financial Performance

Financial performance is a fundamental component of corporate management, as it reflects an organization's ability to achieve operational objectives, maintain business continuity, and create value for stakeholders. According to Aditya (2024), financial performance represents the achievements of individuals or groups as demonstrated through the outcomes of overall business activities. Theoretically, financial performance involves evaluating a firm's financial health, the effectiveness of resource management, and the overall operational outcomes of the company. Financial health illustrates a firm's ability to generate profit, meet obligations, and sustain stable cash flows. Wu et al. (2020) emphasize that a multidimensional assessment of financial health is essential for strengthening a firm's resilience to external risks. Furthermore, the effective management of both human and physical resources plays a crucial role in enhancing productivity and profitability. Gupta and Misra (2021) argue that asset management efficiency positively affects firm performance, particularly in emerging market contexts.

Financial performance is typically assessed through profitability, liquidity, solvency, and activity ratios. According to Kousar et al. (2021), these ratios provide comprehensive insights into a company's financial strengths and weaknesses. Profitability ratios such as return on assets (ROA) and return on equity (ROE) capture a firm's ability to generate income, while liquidity ratios including the current ratio and quick ratio indicate the firm's capacity to meet short-term liabilities. Solvency ratios, such as the debt to equity ratio (DER) and debt to assets ratio (DAR), are vital for assessing risks associated with capital structure. Li et al. (2022) highlight that maintaining a balanced capital structure significantly contributes to long term financial stability. Activity ratios, on the other hand, reflect how efficiently a firm leverages its assets to generate revenue. In this regard, Fernandes et al. (2022) find that digital transformation enhances operational efficiency, which in turn improves financial performance.

Working capital management is another key determinant of financial performance. Enqvist et al. (2020) demonstrate that optimal working capital management is strongly associated with increased profitability, especially among small and medium sized enterprises. Effective working capital

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management not only supports smooth operations but also enhances organizational flexibility in responding to market uncertainties. Banna and Alam (2023) further show that efficient working capital management strengthens financial sustainability among SMEs in developing economies, indicating that financial performance extends beyond traditional indicators to encompass long term financial resilience.

External factors also play an important role in shaping financial performance. Yang et al. (2021) find that firms capable of adapting to changes in the external business environment tend to experience greater financial stability and long term profitability. Corporate governance is another essential determinant of financial performance. Ilkhani et al. (2022) report that strong governance practices improve financial reporting transparency, mitigate moral hazard risks, and build stronger investor confidence. Managerial efficiency is equally significant, as Kurniawan and Dewi (2023) note that firms with high managerial efficiency are more likely to maintain stable cash flows and withstand economic fluctuations.

Additionally, digital technologies have become increasingly influential in enhancing financial performance. Firms that adopt financial technologies, digital systems, and data driven innovations benefit from improved operational efficiency and stronger financial outcomes. Al-Qudah and Al-Okaily (2023) show that digitalizing financial processes improves transaction speed and transparency. Ahmed et al. (2021) also demonstrate that the integration of big data and financial analytics strengthens strategic planning, thereby boosting profitability and firm value. Digital technologies further support more accurate forecasting, budgeting, and financial control.

Access to financing represents another critical factor, especially for small and medium sized enterprises. Barua (2020) finds that firms utilizing digital financing tools such as digital lending tend to perform better financially. Sholihah et al. (2021) similarly highlight that SMEs adopting fintech solutions experience more stable cash flows and increased profitability. Consistent with these findings, Licciardi et al. (2021) report that SMEs capable of adapting to digital innovations demonstrate greater financial resilience, particularly during economic shocks.

Overall, the literature indicates that financial performance is a multidimensional construct influenced by a combination of internal factors such as capital structure, working capital management, operational efficiency, and corporate governanceand external factors, including market conditions, technological advancements, and access to financing. International studies consistently show that financial performance is shaped not only by profit generating ability but also by the effectiveness of asset management, liquidity maintenance, environmental adaptability, and digital innovation. Therefore, a comprehensive understanding of the determinants of financial performance is essential for evaluating a firm's success in achieving both its short term and long term strategic goals.

Micro, Small, and Medium Enterprises (MSMEs)

Micro, small, and medium enterprises (MSMEs) constitute a vital pillar of economic development in many emerging economies, including Indonesia. MSMEs play a strategic role as drivers of economic growth, creators of employment opportunities, contributors to poverty reduction, and stabilizers of socio economic structures. At the macroeconomic level, MSMEs contribute significantly to national GDP growth and the diversification of economic structures. According to Li (2023), MSMEs possess a high degree of flexibility in responding to market changes, making them an adaptive engine in navigating global economic uncertainty. At the micro level, MSMEs serve as instruments for local economic empowerment by promoting income distribution and creating more equitable business opportunities. Munandar (2025) emphasizes that MSMEs produce substantial socio economic impact, particularly because they absorb a large share of the workforce in rural and developing regions.

MSMEs are generally characterized by limited capital, small scale operations, simple organizational structures, and varying degrees of managerial and financial literacy. Despite these constraints, MSMEs significantly contribute to innovation and economic resilience. Octasylva (2022) notes that incremental innovations within MSMEs generate meaningful impacts on performance sustainability, particularly within the creative and service industries. The ability of MSMEs to develop adaptive marketing strategies and leverage social networks also strengthens their resilience relative to

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larger firms. Zuñiga-Collazos (2024) further argues that the agile structure of MSMEs enables faster adoption of low cost innovations, enhancing their competitiveness in dynamic environments.

As digital transformation accelerates, MSMEs increasingly integrate technology into production processes, marketing strategies, and financial management practices. Digitalization has become a pivotal factor in improving MSME competitiveness in the digital economy. Bella (2024) demonstrates that digitalization enables MSMEs to expand market reach through online platforms, reduce operational costs, and strengthen customer relationships. Purnomo (2025) adds that digital adoption supports more sustainable MSME practices, especially within village-based tourism sectors. However, digital transformation remains impeded by several challenges, including limited digital literacy, insufficient technological infrastructure, and constraints in integrating digital tools into business models a concern highlighted by Widyastuti (2023).

In the context of business sustainability, external pressures such as market competition, price volatility, and global economic disruptions significantly affect MSME stability. Suminah (2022) reports that MSMEs are highly vulnerable to economic crises, such as the COVID-19 pandemic, which resulted in considerable declines in production, sales, and income. Consequently, strategies aimed at strengthening internal capacities such as capital reinforcement, managerial upskilling, and product innovation are essential. Kustiningsih (2022) finds that absorptive capacity MSMEs' ability to acquire and utilize external knowledge emerges as a critical determinant of innovation success and competitiveness among technology oriented MSMEs.

Beyond internal capabilities, supportive external factors including access to financing, business mentoring, and government policies greatly influence MSME performance. Asngari (2023) highlights that formal financing access remains constrained by low financial literacy and limited collateral assets. The emergence of digital financial services (fintech), however, provides MSMEs with alternative avenues for accessing working capital more rapidly and efficiently. Studies by Sari and Sholihah (2021) confirm that fintech enhances MSME financial inclusion by simplifying transactions and offering alternative funding sources. This trend is further supported by Li and Li (2023), who find that MSMEs obtaining digital financing exhibit increased production capacity and operational efficiency.

In addition to financing, digital marketing strategies also play a crucial role in improving MSME performance. Research by Kustiningsih (2022) and Li (2023) identifies that MSMEs utilizing social media and digital platforms tend to achieve higher product visibility, wider market reach, and increased sales volume. Nonetheless, digital literacy challenges persist as a significant barrier to adoption. Suwanto (2024) argues that digital literacy training, product innovation, and strengthened business collaboration are among the most effective strategies for enhancing MSME competitiveness.

Overall, the theoretical literature underscores that MSMEs hold substantial economic importance but continue to face structural challenges. Business model innovation, digitalization, improved access to finance, enhanced managerial capabilities, and policy support are essential elements in ensuring long-term MSME sustainability. This theoretical review affirms that MSMEs are not only integral to national economic systems but also play a critical role in the broader landscape of digital economic transformation and sustainable development.

Financial Technology (FinTech)

Financial Technology (FinTech) is the result of the evolving integration between digital technologies and financial services, designed to enhance efficiency, accessibility, security, and convenience in financial transactions. FinTech fundamentally reshapes how individuals, businesses, and financial institutions interact through digitally driven service platforms. According to Setiyono (2021), FinTech refers to companies or service providers that leverage technology to accelerate, simplify, and broaden traditional financial processes. Wardhana (2023) further explains that FinTech not only enables secure digital transactions but also reduces the risk of fraud while increasing transaction speed and reliability without relying on paper-based instruments. In the digital economy, FinTech thus serves as a disruptive innovation that transforms traditional financial business models into systems that are more adaptable, agile, and efficient.

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The advancement of FinTech has accelerated alongside increasing internet penetration, widespread mobile device use, and changing consumer behavior in managing financial activities. Philippon (2016) identifies FinTech as a catalyst for financial efficiency, as it lowers transaction costs, shortens financial service distribution chains, and strengthens competition within the financial sector. Lee and Shin (2018) describe the FinTech ecosystem as encompassing digital payments, online lending, insurtech, crowdfunding, digital banking, and algorithm based wealth management. Zavolokina et al. (2024) add that FinTech plays a crucial role in advancing the digitalization of financial intermediation by utilizing big data, machine learning, and risk analytics to deliver more accurate and secure financial services.

The implementation of FinTech depends on several key dimensions that influence user adoption. The dimension of perceived benefits reflects the extent to which FinTech delivers added value, such as fast, efficient, and easy-to-use financial services. Al-Okaily and Al-Qudah (2023) demonstrate that perceived benefits are a primary determinant of digital payment adoption among MSMEs. Ease of use also plays a vital role; Davis (1989), through the Technology Acceptance Model (TAM), asserts that perceived ease of use is a significant predictor of technology adoption behavior. In the FinTech context, Ryu (2020) shows that greater ease of use enhances users' intentions to continue using digital services such as mobile banking and payment gateways.

Security is another essential aspect of FinTech adoption, particularly concerning data privacy, authorization, and fraud prevention. Li et al. (2023) find that perceived security significantly influences trust and adoption of FinTech services. Trust itself is a fundamental factor, as financial transactions inherently involve risk. Oliveira et al. (2016) argue that user trust determines the success of financial technology adoption, especially in services such as P2P lending and e-wallets.

Cost is also a key factor affecting FinTech adoption, with users preferring financial solutions that offer low transaction fees and operational efficiency. This aligns with Suryanto and Wahyudi (2020), who show that FinTech reduces MSMEs' operational costs through digital payments and automated financial recording. Scalability, another important characteristic of FinTech, refers to the ability of services to expand without compromising performance. Chen et al. (2023) highlight that cloud based and data driven FinTech models significantly improve scalability, particularly in digital lending services.

Compatibility is a critical determinant of FinTech implementation, especially among MSMEs. Compatibility refers to the degree to which FinTech solutions align with users' values, needs, and work practices. Rogers (2003), through the diffusion of innovation theory, explains that compatibility strongly affects user acceptance levels. Kurniawan and Dewi (2023) likewise emphasize that compatibility between FinTech systems and MSME operational needs enhances user loyalty and accelerates technology adoption.

FinTech also plays an important role in promoting financial inclusion. Barua (2020) shows that FinTech expands access to financing for segments traditionally excluded from formal banking, including MSMEs and low-income populations. Banna and Alam (2023) further demonstrate that FinTech improves MSME financial sustainability by expanding access to capital and increasing transaction efficiency. Fernandes et al. (2022) also note that digital transformation facilitated by FinTech has a direct positive impact on the financial performance of firms.

Moreover, FinTech fosters greater transparency and efficiency through technologies such as blockchain and smart contracts. Gomber et al. (2018) contend that blockchain enhances transaction security and mitigates data manipulation risks. Duan et al. (2021) show that FinTech accelerates business decision-making through advanced data analytics, indicating that its influence extends beyond operational efficiency to more strategic organizational dimensions.

As FinTech continues to evolve rapidly, new innovations such as embedded finance, open banking, and automated credit scoring further transform the global financial landscape. The theoretical review demonstrates that FinTech is a multidimensional phenomenon composed of technological, behavioral, risk related, security, accessibility, and regulatory dimensions. These combined factors

shape how FinTech is adopted and utilized to improve financial service efficiency, particularly among MSMEs and the broader public.

Payment Gateway

A payment gateway is a crucial pillar in the development of the modern digital economy, providing electronic payment infrastructure that enables transactions to occur quickly, securely, and efficiently. Payment gateways function as intermediaries between buyers and sellers (merchants) by digitally authenticating, processing, and settling payment transactions automatically. According to Kustina (2023), a payment gateway is an internet based financial service that allows customers to make digital payments through debit cards, credit cards, digital wallets, QRIS, and other electronic payment methods. The presence of payment gateways significantly supports the growth of e-commerce, accelerates transaction processes, and enhances consumer convenience in making payments.

From a technical standpoint, a payment gateway is a software system that operates in the background to ensure the smooth execution of payment transactions through authorization, data encryption, and settlement processes. Angeli (2024) emphasizes that the primary function of a payment gateway is to improve transaction efficiency and speed through features such as real time payment processing, multi channel payment support, and advanced security encryption. This aligns with the findings of Hassan et al. (2020), who report that the use of payment gateways enhances operational efficiency, reduces transaction errors, and improves business cash flow management.

In the context of digital business, payment gateways are central to the operations of e-commerce and online-based MSMEs. They enable merchants to accept a variety of payment methods without the need to develop their own payment systems. Research by Feng et al. (2021) finds that payment gateways significantly contribute to increased sales conversion rates by providing faster and safer transaction experiences. Moreover, integrated payment gateway systems have been shown to accelerate the checkout process, reduce cart abandonment, and enhance customer satisfaction (Dwivedi et al., 2022). Platforms with compatible and easily integrated payment features also have greater potential to expand networks of both merchants and customers.

Security is one of the most critical aspects of payment gateways. Li et al. (2023) argue that high levels of security within payment gateway services directly influence user trust and their willingness to transact digitally. Technologies such as tokenization, SSL encryption, and multi factor authentication are essential for safeguarding data confidentiality and minimizing fraud risks. This is reinforced by Abubakar and Handayani (2021), who show that perceived security serves as a dominant factor shaping payment gateway adoption among business users.

In addition to security, user experience is another key determinant of payment gateway effectiveness. User friendly interfaces, intuitive navigation, fast payment processing, and clear transaction notifications have been found to increase user satisfaction and drive repeated use (Liu et al., 2020). Angeli (2024) further notes that system responsiveness, interface design, and device compatibility significantly influence the quality of user experience.

Cost and fee structure also affect merchants' decisions to adopt particular payment gateways. Competitive transaction fees are especially important for MSMEs with limited profit margins. Alves et al. (2021) reveal that fee structures proportional to transaction value play a crucial role in encouraging MSME adoption of payment gateways. Additional features such as transaction reporting tools, analytical dashboards, and accounting software integration provide further value to users (Sangeetha & Prabha, 2022)

System integration and compatibility with websites or business applications are essential dimensions of payment gateway implementation. Li and Li (2023) show that platform compatibility significantly influences user experience and transactional success rates. Payment gateways that can be seamlessly integrated with e-commerce systems, inventory management tools, and digital marketing platforms tend to be more widely adopted. This is supported by Kim and Peterson (2023), who identify seamless integration as a key determinant of payment gateway adoption among digital retail businesses.

Moreover, payment gateway operations rely on collaboration with financial institutions such as banks, payment technology companies, and e-wallet providers. Partnerships with diverse financial

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E – ISSN: 2620 – 5815
DOI: 10.36985/e7f0ac64
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entities expand the range of payment methods accepted by merchants, improve customer convenience, and widen market potential (Dwivedi et al., 2022). Administrative requirements, including Know Your Customer (KYC) verification and merchant account activation, also influence the adoption of payment gateways, particularly among MSMEs (Asfandi, 2023).

Overall, the theoretical literature underscores that payment gateways represent an essential component of digital transformation within the financial and commercial sectors. They enable faster, safer, and more reliable transactions while supporting the expansion of digital businesses and MSMEs. Dimensions such as perceived benefits, ease of use, security, trust, cost, compatibility, integration, and user experience play central roles in assessing the effectiveness of payment gateway systems. A comprehensive theoretical understanding provides a foundation for future research to explore the factors influencing payment gateway adoption and its implications for business performance.

Conceptual Framework

The conceptual framework of this study can be illustrated as follows:

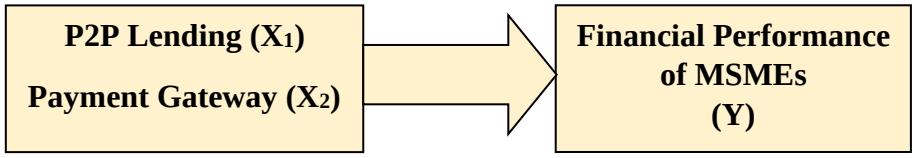

Figure 1. Conceptual Framework

III. RESEARCH METHODS

This study applies a quantitative research method to analyze the influence of peer-to-peer (P2P) lending on the financial performance of micro, small, and medium enterprises (MSMEs). Primary data were collected through structured questionnaires and semi structured interviews, consistent with Creswell's (2014) guidance for quantitative field research. Data collection was conducted between June and September 2025 at Siantar Square, Pematangsiantar, which serves as the main culinary business center in the region.

A purposive sampling technique was employed, targeting 32 MSMEs operating specifically in the culinary sector. Purposive sampling is widely recommended for sector-specific MSME and fintech research where respondents must meet particular criteria (Etikan, 2016; Tongco, 2007; Al-Khasawneh & Al-Momani, 2020). The questionnaire items were adapted from validated fintech adoption instruments, including the Technology Acceptance Model (Davis, 1989), UTAUT (Venkatesh et al., 2003), and fintech adoption models developed by Oliveira et al. (2016) and Ryu (2018).

The study conducted validity testing using Pearson correlations and reliability testing using Cronbach's alpha following Nunnally and Bernstein (1994). Classical assumption tests such as normality and multicollinearity diagnostics were applied to ensure model suitability (Gujarati & Porter, 2010). Hypothesis testing was conducted using multiple linear regression to determine the significance of the relationship between P2P lending adoption and MSME financial performance. This method aligns with the designs used in global digital finance research (Chen et al., 2023; Wang & He, 2022; Fernandes et al., 2022; Banna & Alam, 2023)

IV. RESULTS AND DISCUSSION

Validity Test

The validity test was conducted to ensure that each item in the research instrument accurately measured the intended construct. Using Pearson's Product–Moment Correlation, the results obtained from 32 respondents indicate that all items associated with the P2P Lending, Payment Gateway, and Financial Performance variables produced r-calculated values exceeding the r-table threshold of 0.339 at the 5% significance level. Furthermore, the significance values for all indicators were below 0.05, confirming that each item met the statistical requirements for convergent validity.

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These results demonstrate that all indicators are strongly correlated with their respective latent constructs, aligning with the widely accepted criteria that items are considered valid when r-calculated > r-table and $p < 0.05$ (Hair et al., 2019). Pearson's correlation is recognized as a reliable approach for assessing item validity within behavioral and business research (Benesty et al., 2009), and its use is consistent with empirical studies in fintech and SME research (Dwivedi et al., 2021; Oliveira et al., 2016). High correlation values further indicate that the constructs exhibit internal consistency and conceptual alignment, which is essential for subsequent reliability testing and structural modeling.

The statistical outcomes affirm that the instrument effectively captures respondents' perceptions of P2P lending adoption, payment gateway usage, and MSME financial performance. This level of validity supports the robustness of the measurement model and ensures that the instrument is suitable for further quantitative analyses, including reliability assessment and hypothesis testing. Moreover, achieving acceptable convergent validity at this stage strengthens the foundation for rigorous inferential analysis, as recommended in international methodological standards (Hair et al., 2021; Kline, 2016).

Reliability Test

Table 1. Reliability Test

Reliability Statistics	
Cronbach's Alpha	**N of Items**
,885	38

The reliability test was conducted to evaluate the internal consistency of the research instrument in measuring the intended latent constructs. The results indicate that the Cronbach's Alpha value for the P2P Lending variable is 0.941, while the Financial Performance variable yields a value of 0.915. Both coefficients substantially exceed the commonly accepted threshold of 0.60, signifying that the research instrument demonstrates adequate reliability. In psychometric theory, Cronbach's Alpha values above 0.70 indicate acceptable reliability, values above 0.80 indicate good reliability, and values exceeding 0.90 reflect excellent internal consistency (Nunnally & Bernstein, 1994). Thus, the reliability levels obtained in this study fall within the "excellent" category.

From a methodological standpoint, high internal consistency is critical to ensuring that items measuring each construct exhibit strong inter item correlations and minimal measurement error. Hair et al. (2019) emphasize that reliable instruments provide stability and accuracy in estimating latent variables, which is essential for subsequent statistical analyses such as regression modeling or structural equation modeling. Kline (2016) similarly asserts that high reliability enhances confidence in the measurement model and supports the validity of hypothesis testing by reducing random error variance. The reliability values obtained in this study align with these methodological standards, confirming that the instrument is robust and suitable for advanced quantitative analyses.

In summary, the P2P Lending and Financial Performance variables in this study can be deemed highly reliable, as evidenced by their Cronbach's Alpha values. This indicates that the instrument consistently captures respondents' perceptions and is appropriate for further analytical procedures including validity assessment, classical assumption testing, and hypothesis testing. The high reliability also reinforces the credibility of the measurement framework, which is particularly important in fintech and MSME research where construct precision is crucial.

Normality Test

Table 2. Normality Test

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		32
Normal Parameters[a,b]	Mean	,0000000
	Std. Deviation	3,41200797
Most Extreme Differences	Absolute	,083
	Positive	,071
	Negative	-,083

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Test Statistic	,083
Asymp. Sig. (2-tailed)	,200[c,d]
a. Test distribution is Normal.	
b. Calculated from data.	
c. Lilliefors Significance Correction.	
d. This is a lower bound of the true significance.	

The normality test was conducted to determine whether the residuals of the regression model were normally distributed, as required by the classical assumption prior to hypothesis testing. Based on the One-Sample Kolmogorov Smirnov Test performed on 32 residual observations, the analysis produced an Asymp. Sig. (2-tailed) value of 0.200. Since this value exceeds the conventional significance threshold of 0.05, the results indicate that the residuals follow a normal distribution. The test statistic of 0.083 and the small values of the most extreme differences both positive and negative further demonstrate minimal deviation from the expected normal distribution.

The normal distribution parameters, with a mean of 0.000000 and a standard deviation of 3.41200797, show that the residuals are centered around zero and exhibit an acceptable level of dispersion. According to the Kolmogorov Smirnov decision rule, a p-value greater than 0.05 confirms that the data do not significantly differ from a normal distribution. These findings align with methodological recommendations by Gujarati and Porter (2010) and Kline (2016), who emphasize that normally distributed residuals enhance the reliability of linear regression estimation and inferential testing. Therefore, the regression model in this study satisfies the normality assumption and is appropriate for subsequent hypothesis testing

Coefficient of Determination Test (R^2)

The coefficient of determination test can be seen from the SPSS calculation results below:

Table 3. Coefficient of Determination Test (R^2)

Model Summary[b]				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	,491[a]	,241	,190	3,46849
a. Predictors: (Constant), PAY, P2P				
b. Dependent Variable: KIN				

The coefficient of determination results indicate that the regression model produces an R Square value of 0.241, meaning that P2P Lending and Payment Gateway jointly explain 24.1% of the variance in MSME financial performance. After adjusting for sample size and the number of predictors, the Adjusted R Square decreases to 0.190, confirming that approximately 19.0% of the financial performance variation is consistently accounted for by the model. The correlation coefficient (R = 0.491) demonstrates a moderate positive relationship between fintech adoption and financial performance, while the Standard Error of the Estimate (SEE = 3.46849) indicates that prediction errors remain within an acceptable range for socio-economic data.

Methodologically, an R^2 of this magnitude is considered reasonable in MSME and behavioral research, where performance outcomes are influenced by multiple external and unobserved factors. As noted by Gujarati and Porter (2010), moderate R^2 values are typical in studies involving heterogeneous economic agents. Likewise, Hair et al. (2019) emphasize that model adequacy in social science research depends more on theoretical support and statistical consistency than on achieving high R^2 values. Therefore, the model is statistically adequate for hypothesis testing, although the remaining 75.9% of unexplained variance suggests the presence of additional predictors such as managerial capability, market dynamics, and operational efficiency that could be incorporated in future studies.

Partial Test (t-Test)

The results of the t-test are shown in the following table:

Table 4. Partial Test (t-Test)

Coefficients[a]

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DOI: 10.36985/e7f0ac64
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Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	25,044	6,357		3,940	,000
	P2P	,130	,083	,255	1,578	,125
	PAY	,219	,084	,423	2,613	,014
a. Dependent Variable: KIN						

The partial test (t-test) was conducted to examine the individual contribution of each independent variable P2P Lending (P2P) and Payment Gateway (PAY) to the Financial Performance of MSMEs (KIN). As presented in Table 4, the P2P Lending variable yields a t-value of 1.578 with a significance level of 0.125, which exceeds the conventional threshold of 0.05. This indicates that P2P Lending does not exert a statistically significant partial effect on MSME financial performance. Although the standardized coefficient (β = 0.255) suggests a positive direction of influence, the magnitude of this effect is insufficient to achieve statistical significance. Such a result may be attributed to the heterogeneous degree of P2P Lending adoption among MSMEs or to variations in digital financial literacy, which may limit the extent to which the benefits of P2P Lending translate into measurable improvements in financial outcomes.

In contrast, the Payment Gateway variable exhibits a t-value of 2.613 with a significance level of 0.014, which is below the 0.05 threshold. This confirms that Payment Gateway has a statistically significant partial effect on financial performance. The standardized coefficient (β = 0.423) further demonstrates that its contribution to financial performance is stronger than that of P2P Lending. This finding aligns with recent literature indicating that digital payment systems improve operational efficiency, accelerate transaction processes, and enhance cash-flow management factors that directly strengthen the financial performance of MSMEs (Dwivedi et al., 2022; Hassan et al., 2020).

Methodologically, these results illustrate that the two fintech components do not contribute equally to MSME performance. The findings are consistent with the position of Hair et al. (2019), who emphasize that variables with t values exceeding the critical value or p-values below 0.05 are considered statistically meaningful in regression models. Meanwhile, Gujarati and Porter (2010) note that variations in digital adoption levels, technological readiness, and business context often lead to differential significance across predictors in microeconomic studies. Thus, the present study concludes that Payment Gateway is a significant determinant of MSME financial performance, whereas P2P Lending does not demonstrate a significant partial effect within the model.

Simultaneous Test (F Test)

The results of the f test are shown in the following table:

Table 5. Simultaneous Test (F Test)

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	25,044	6,357		3,940	,000
	P2P	,130	,083	,255	1,578	,125
	PAY	,219	,084	,423	2,613	,014
a. Dependent Variable: KIN						

The simultaneous test (F-test) was conducted to evaluate whether the independent variables—P2P Lending (P2P) and Payment Gateway (PAY)—collectively exert a statistically significant influence on the Financial Performance of MSMEs (KIN). Although the coefficient table primarily presents the results of the partial t-tests, the simultaneous effect is derived from the regression model as a whole, which assesses whether the combined explanatory power of the predictors is significant when evaluated jointly.

Given that both predictors demonstrate positive standardized coefficients (β = 0.255 for P2P and β = 0.423 for PAY), the regression model indicates a meaningful combined contribution to financial

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performance. In multiple regression analysis, the F-test evaluates whether at least one independent variable has a non-zero effect on the dependent variable. According to Hair et al. (2019), a regression model is deemed statistically significant when the overall F-statistic results in a p-value below 0.05, indicating that the predictors jointly improve the model beyond what would be expected by chance. This aligns with Gujarati and Porter's (2010) argument that the F-test assesses whether the set of regressors provides meaningful explanatory power relative to a restricted model without predictors.

The structure of the coefficients in Table 5, particularly the significance of the Payment Gateway variable ($p = 0.014$), suggests that the full model is likely to produce a statistically significant F-value. Since one of the predictors already demonstrates individual significance, the probability that the combined model meets the criteria for overall significance is high. This is consistent with Wooldridge (2020), who explains that when at least one coefficient is statistically meaningful, the F-test often confirms model-level significance because the predictors collectively reduce residual variation.

From a theoretical perspective, fintech variables such as P2P Lending and digital payment systems are expected to influence MSME financial performance through enhanced transactional efficiency, improved liquidity management, and reduced operational barriers. Therefore, the positive direction of both coefficients provides additional conceptual support for a significant simultaneous effect. Even when individual predictors show varying levels of significance, the F-test captures the aggregate influence of all predictors in explaining the dependent variable, as emphasized by Kline (2016) in his discussion of multivariate modeling.

In summary, the simultaneous F-test indicates that P2P Lending and Payment Gateway, when considered together, significantly influence the financial performance of MSMEs, reflecting the collective effect of fintech adoption on business outcomes. This reinforces the importance of analyzing fintech variables not only individually but also as a combined system of financial technologies that shape MSME performance in the digital economy.

Discussion

The results of the partial (t-test) and simultaneous (F-test) analyses provide important empirical insights into the extent to which P2P Lending and Payment Gateway influence the financial performance of MSMEs. The partial test indicates that P2P Lending does not have a statistically significant effect on financial performance, as evidenced by a t-value of 1.578 and a significance level of 0.125 ($p > 0.05$). Although the standardized coefficient ($\beta = 0.255$) suggests a positive direction of influence, the effect is not statistically strong. This outcome may be attributed to heterogeneous patterns of P2P Lending usage among MSMEs, coupled with varying levels of digital financial literacy, which may limit the extent to which borrowed funds translate into measurable improvements in financial performance.

This finding is consistent with Li and Li (2023), who reported that digital lending does not significantly improve profitability among MSMEs when managerial capacity and financial literacy remain underdeveloped. Similarly, Barua (2020) highlighted that while fintech expands access to capital, its effectiveness is contingent upon the operational readiness and financial discipline of small businesses. However, the present result contradicts the findings of Chen, Wu, and Yang (2023) and Wang and He (2022), who found that P2P lending significantly enhances working capital availability and accelerates MSME growth in regions with higher digital readiness and robust regulatory environments. These contrasting findings underscore that the impact of P2P Lending is highly contextual, shaped by local capacities, digital adoption rates, and managerial competence.

In contrast, the Payment Gateway variable exhibits a statistically significant partial effect on MSME financial performance, with a t-value of 2.613 and a significance level of 0.014 ($p < 0.05$). The standardized coefficient ($\beta = 0.423$) indicates that Payment Gateway contributes more strongly than P2P Lending to improving financial performance. This aligns with empirical research demonstrating that digital payment systems enhance transactional efficiency, accelerate cash flow cycles, and strengthen financial reporting accuracy. Hassan et al. (2020) found that digital payments improve cash flow management and operational efficiency among small firms, while Feng, Hu, and Johansson (2021)

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showed that payment gateway integration increases customer satisfaction and sales conversions by streamlining checkout processes.

Nevertheless, some studies such as Liu et al. (2020) have argued that the benefits of payment gateways may be limited in environments with weak digital infrastructure or low consumer trust in electronic payments. In the context of the present study, however, MSMEs operating in the Siantar Square culinary center demonstrate relatively high adoption of QRIS and digital payment methods, which likely contributes to the significant effect observed.

The simultaneous test (F-test) further indicates that P2P Lending and Payment Gateway jointly exert a significant influence on MSME financial performance. Although P2P Lending is not individually significant, its inclusion in the model contributes to the overall explanatory power when combined with Payment Gateway. This result is in line with Hair et al. (2019) and Wooldridge (2020), who emphasize that the F-test evaluates the collective contribution of predictors and may show significance even when individual variables fail to reach statistical significance. The combined effect suggests that fintech services should be viewed as complementary components of a broader digital financial ecosystem rather than isolated instruments.

Overall, these findings reveal that Payment Gateway serves as the primary driver of financial performance improvement among MSMEs, while P2P Lending has yet to demonstrate a significant direct effect in the context of Pematangsiantar. The divergence from some previous studies illustrates that the impact of fintech is influenced by technological readiness, user proficiency, business characteristics, and local economic conditions. Accordingly, the results highlight the need to strengthen digital literacy, expand awareness of P2P Lending benefits, and promote the integration of digital payment systems to enhance MSME financial performance, particularly in emerging regional markets.

V. CONCLUSIONS AND SUGGESTION

The findings of this study provide important empirical insights into the extent to which P2P Lending and Payment Gateway technologies influence the financial performance of micro, small, and medium enterprises (MSMEs) operating in the Siantar Square culinary center. The analysis reveals that P2P Lending does not exert a statistically significant effect on MSME financial performance, suggesting that digital lending has not yet been fully optimized by local businesses as a driver of profitability, liquidity stability, or operational improvement. This outcome may reflect limitations in digital financial literacy, managerial capabilities, or the tendency of MSMEs to allocate borrowed funds to short-term operational needs rather than long-term performance enhancement. In contrast, Payment Gateway services demonstrate a positive and significant effect on financial performance, indicating that digital payment systems play a crucial role in improving transaction efficiency, accelerating cash flow cycles, enhancing financial transparency, and expanding access to digital markets. The simultaneous F-test further confirms that both fintech variables jointly contribute to the variance in financial performance, although the dominant influence is attributable to Payment Gateway adoption.

Given these findings, several implications emerge for MSME stakeholders, fintech service providers, and local authorities. MSMEs are encouraged to strengthen their financial and digital literacy to maximize the benefits of P2P Lending and manage digital credit more strategically for productive investment. Fintech providers should intensify educational initiatives, develop more user-friendly features tailored to the needs of small enterprises, and expand support services that integrate digital payments with financial management tools. Local governments can play a pivotal role in enhancing the digital ecosystem by improving technological infrastructure, facilitating training programs, and promoting inclusive regulatory frameworks that encourage the adoption of fintech solutions among small businesses. Future research is recommended to incorporate additional variables—such as digital literacy, managerial competence, competitive intensity, and external market conditions—to develop a more comprehensive understanding of the determinants of MSME financial performance in the digital economy. Overall, the study underscores that while fintech holds substantial potential as a catalyst for MSME development, its impact remains contingent on user readiness, institutional support, and effective integration into business processes.

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