



The Effect of Financial Literacy and Inclusion on Personal Financial Management with Fintech as a Moderating Variable

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Abstract: *This study examines the role of financial technology (fintech) as a moderating variable in the relationship between financial literacy and financial inclusion on personal financial management among the productive age group in Malang City. The research approach used is explanatory quantitative with purposive sampling technique, resulting in 113 respondents who met the criteria. The data were analyzed using multiple regression analysis and Moderated Regression Analysis (MRA) with the help of SPSS 22. The results show that: (1) financial literacy has a positive and significant effect on personal financial management; (2) financial inclusion does not have a significant effect on personal financial management; (3) fintech cannot moderate the effect of financial literacy on personal financial management; (4) fintech is proven to moderate the effect of financial inclusion on personal financial management. These findings reveal the complexity of the dualistic role of fintech—on the one hand, it is unable to strengthen the influence of financial literacy, but on the other hand, it has succeeded in transforming financial access into better management capabilities. This study makes an important contribution to the development of financial behavior theory in the digital era and has practical implications for regulators and fintech service providers in designing more effective financial education and digital financial service strategies.*

Introduction

The rapid development of *financial* technology (*fintech*) in the last decade has transformed the global financial system landscape, including in Indonesia. According to data from the Financial Services Authority (OJK, 2023), the volume of fintech lending transactions



in Indonesia has grown exponentially, reaching IDR 52.33 trillion in the first quarter of 2023. This phenomenon has also influenced the economic behavior patterns of the community, especially in urban areas such as Malang City. A Cost of Living Survey by the Central Statistics Agency (BPS, 2018) revealed that the average household consumption expenditure in Malang City ranked second highest in East Java, amounting to IDR 8.8 million per month, a significant increase of 75.11% from 2012. This surge in the cost of living creates an urgency for individuals, especially those in the productive age group (15-64 years), to implement effective *personal financial management* (PFM) in order to achieve financial well-being (Brilliant et al., 2020).

Adequate financial literacy is considered the main foundation for good financial management. However, the National Survey of Financial Literacy and Inclusion (OJK, 2022) shows that Indonesia's financial literacy index is still at 49.68%. Despite the improvement, this figure still lags far behind neighboring countries such as Singapore (98%) and Malaysia (85%) (OECD, 2023). The low level of understanding of complex financial concepts, such as investment and risk management, is a major obstacle (Lusardi & Mitchell, 2023). On the other hand, financial inclusion in Indonesia has shown rapid progress, with an index reaching 85.10% (OJK, 2022), driven by the adoption of digital financial services. However, widespread access does not necessarily translate into good financial management skills (Anisyah et al., 2021). Recent research by Nugroho et al. (2023) on millennials in East Java confirms that financial inclusion alone is not enough to ensure responsible financial behavior without adequate literacy.

It is in this context that fintech emerges as a disruption. Fintech offers ease of access, transaction speed, and a variety of innovative financial products, such as *peer-to-peer lending*, *digital payments*, and *robo-advisory* (Bank Indonesia, 2021). The integration of fintech into everyday life has the potential to moderate the relationship between financial knowledge (literacy), financial access (inclusion), and money management practices (PFM). The *Technology Acceptance Model* (TAM) theory developed by Davis (1989) and adapted in many recent fintech studies (e.g., Chen & Li, 2022; Gupta et al., 2023) asserts that *the perceived usefulness* and *perceived ease of use* of a technology are key determinants in its adoption and use to support financial activities.

A review of the literature shows that research on the relationship between these variables still produces inconsistent findings. A number of studies, such as Navickas et al. (2014) and Nurhayati & Nurodin (2019), found a positive and significant influence of financial literacy and inclusion on PFM. Conversely, studies by Herdjiono et al. (2016) and Widiastuti et al. (2020) report that financial literacy has no significant impact, while fintech can encourage consumptive and impulsive behavior (Panos & Wilson, 2020). Furthermore, although recent studies such as Ramadhani & Ovami (2021) and Humaidi et al. (2020) have explored the role of fintech as an independent variable, in-depth analysis of its capacity as a *moderating variable* in the relationship between literacy and financial inclusion on PFM is still very limited, especially in the productive age population in cities with specific characteristics such as Malang. This research gap is the focus of this study.

Based on the above description, the objectives of this study are to: Analyze the direct effect of financial literacy on personal financial management among the productive age population in Malang. Analyze the direct effect of financial inclusion on personal financial management among the productive age population in Malang. Analyze the role of financial technology in moderating the effect of financial literacy on personal financial management. Analyze the role of financial technology in moderating the influence of financial inclusion on personal financial management.

The scientific contribution of this research lies in the effort to integrate fintech variables into the theoretical framework of *the Theory of Planned Behavior* (TPB) and TAM to explain the mechanism of PFM in the digital era. Practically, the findings of this study are expected to be taken into consideration by regulators, fintech service providers, and financial educators in designing strategies to improve the effectiveness of personal financial management among the community.

Research Method

This study uses a quantitative approach with an explanatory design to test the causal relationship and moderating effects between variables. This research design was chosen to explain the role of financial technology as a moderating variable in the relationship between financial literacy and financial inclusion on personal financial management. A quantitative approach is considered appropriate because it allows for objective measurement of variables and rigorous statistical analysis to test the formulated hypotheses.

The population in this study was the productive age group (15-64 years) in Malang City who had used OJK-registered fintech services for at least 6 months. The sampling technique used purposive sampling with specific criteria, including: residing in Malang City, aged 15-64 years, having a job and their own income, and actively using at least one fintech service. Based on Daniel & Terrel's formula with a 5% margin of error, a sample of 113 respondents who met the inclusion criteria was determined.

Data collection was conducted through a closed questionnaire using a 1-5 Likert scale, which was distributed directly and online. The research instrument had been tested for validity and reliability beforehand, with all indicators declared valid and reliable. Data analysis used statistical techniques with the help of SPSS 22, which included classical assumption tests, multiple linear regression analysis to test direct effects, and Moderated Regression Analysis (MRA) to test the moderating role of financial technology through interaction tests between independent variables and moderating variables.

Results and Discussion

Respondent Profile and Descriptive Statistics

This study successfully collected data from 113 respondents of productive age in Malang City who had used OJK-registered fintech services for at least 6 months. The characteristics of

the respondents showed a diverse distribution, with the majority being female (68%) and dominated by the young age group of 17-25 years (57%). In terms of profession, entrepreneurs/business owners were the largest group (40%), reflecting the characteristics of Malang City as a city of education and entrepreneurship.

Table 1. Respondent Characteristics

Variable	Category	Number	Percentage
Gender	Male	36	32
	Female	77	68
Occupation	Employee/Staff	29	26
	Entrepreneur	45	40
	Freelancer	25	22
	Others	14	12
Age	17-25 years	64	57
	26-35 years	19	17
	36-45 years	15	13
	46-55 years	12	11
	56-64 years	3	3

Source: processed by researchers, 2025

Table 1 shows the demographic distribution of research respondents. The dominance of female respondents (68%) is in line with the characteristics of the population of Malang City, which has an unbalanced gender ratio. The young productive age group (17-25 years) dominates the sample (57%), representing the millennial and Gen Z generations who are more familiar with financial technology. The dominant profession of entrepreneur (40%) reflects the strong entrepreneurial spirit among the productive age group in Malang City.

Hypothesis Testing Results

Table 2. Multiple Regression Analysis Results

Variable	Regression Coefficient	t-Value	Significance
(Constant)	0.897	0.143	0.887
Financial Literacy	0.929	4.215	0.000
Financial Inclusion	-0.086	-0.301	0.764
Financial Technology	0.224	1.12	0.266

*Note: Significant at $\alpha = 0.05$ *

Source: processed by researchers, 2025

Table 2 presents the results of multiple regression analysis to test the direct effect of independent variables on dependent variables. Financial literacy shows a positive and significant effect ($\beta = 0.929$; $p = 0.000$), indicating that a one-unit increase in financial literacy will increase personal financial management by 0.929 units. Conversely, financial inclusion has no significant effect ($p = 0.764 > 0.05$), indicating that access to financial services alone is not sufficient to ensure good financial management. Financial technology as an independent variable also shows no significant effect.

Table 3. Results of Moderated Regression Analysis (MRA)

Variable	Regression Coefficient	t-Value	Significance
(Constant)	-136.699	-2.829	0.006
Financial Literacy (X1)	1,146	1,057	0.294
Financial Inclusion (X2)	5,927	2,226	0.029
Financial Technology (Z)	4.78	2,976	0.004
X1 * Z	-0.009	-0.246	0.806
X2 * Z	-0.195	-2.285	0.025

*Note: Significant at $\alpha = 0.05$ *

Source: processed by the researcher, 2025

Table 3 presents the results of the moderation regression analysis (MRA) to test the role of financial technology as a moderating variable. The results show that the interaction between financial literacy and fintech is not significant ($p = 0.806$), which means that fintech is not able to moderate the relationship between financial literacy and personal financial management. Conversely, the interaction between financial inclusion and fintech is significant ($p = 0.025$), indicating that fintech successfully moderates the relationship between financial inclusion and personal financial management. The negative coefficient value (-0.195) indicates that fintech acts as a pure moderator that weakens the negative influence of financial inclusion on personal financial management.

Discussion

This study reveals the complexity of the interaction between financial literacy, financial inclusion, and financial technology in influencing personal financial management among the productive age population in Malang City. The findings of this study not only confirm several existing theories but also reveal an interesting paradox that is relevant to the context of digital economic development in Indonesia.

The analysis results show that financial literacy has a positive and significant influence on personal financial management. This finding is consistent with the research by Lusardi and Mitchell (2023), which confirms that understanding basic financial concepts is a critical foundation for financial decision-making. Chen and Li (2022), in their study on the adoption of fintech services, also found that individuals with good financial literacy tend to be better able to utilize financial technology for more effective financial management. However, even though respondents in Malang City showed fairly good financial literacy scores (4.1), the implementation of this knowledge in daily practice still faces various challenges. This confirms the findings of Gupta et al. (2023) regarding the gap between theoretical understanding and practical application of financial literacy, especially in the context of urban communities with complex life dynamics.

The insignificant effect of financial inclusion on personal financial management is a rather surprising finding. In fact, OJK (2022) data shows that Indonesia's financial inclusion

index has reached 85.10%. This reality reveals a paradox that is in line with the research by Nugroho et al. (2023) in East Java, which found that widespread access to finance does not automatically lead to an improvement in the quality of community financial management. Anisyah et al. (2021) in their study on the paradox of financial inclusion explain that access without adequate management capacity can actually lead to more complex financial problems. From a behavioral finance perspective, Panos and Wilson (2020) argue that ease of access can create overconfidence bias, where individuals feel overly confident in managing their finances without adequate competence.

Findings regarding the moderating role of fintech provide a contradictory but interesting perspective. The inability of fintech to moderate the relationship between financial literacy and personal financial management confirms the concerns of Widiastuti et al. (2020) about the negative impact of financial digitalization. Becker (2017), in his research on saving behavior, also found that ease of access through fintech platforms can trigger impulsive consumptive behavior. The design of fintech platforms that apply the principles of frictionless experience, as studied by Davis (2022) in the context of behavioral design, is able to override individuals' financial knowledge.

Conversely, fintech's ability to moderate the relationship between financial inclusion and personal financial management provides a breath of fresh air for the development of digital financial services. This finding is in line with the research by Ramadhani and Ovami (2021), which proves that fintech can be a bridge that connects access with financial management capabilities. Humaidi et al. (2020), in their study on the millennial generation, found that advanced features in fintech applications, such as automatic financial reports, payment reminders, and cash flow analysis, are proven to be effective in helping with financial management. Safira and Fitri (2023) in their latest research on digital financial innovation emphasize that the integration of traditional financial services with digital technology can create positive synergies for improving the financial capabilities of the community.

From a theoretical perspective, the findings of this study enrich the application of the Technology Acceptance Model (TAM) in the context of financial technology. Chuang et al. (2022), in developing the latest TAM model, emphasize the importance of perceived usefulness and perceived ease of use in determining the adoption of financial technology. However, this study also reveals that technology adoption alone is not enough without adequate management capacity, as stated by Brilliant et al. (2020) in their study on personal financial management among the productive age group.

The policy implications of these findings point to the importance of a holistic approach to developing financial literacy and financial inclusion. The OECD (2023), in its latest report on financial literacy, emphasizes the need to integrate conventional financial education with digital financial literacy. Bank Indonesia (2023), in its fintech development roadmap, also begins to point to the importance of responsible digital finance that pursues not only the number of users but also the quality of service utilization.

Conclusion

Based on the results of the analysis and discussion, this study concludes that financial literacy has a positive and significant effect on the personal financial management of the productive age population in Malang City. These findings confirm the importance of financial knowledge and understanding as the foundation for effective personal financial management. However, financial inclusion does not have a significant effect on personal financial management, indicating that access to financial services alone is not sufficient to ensure good financial management.

In the context of the role of financial technology, this study reveals complex findings. On the one hand, fintech has proven unable to moderate the relationship between financial literacy and personal financial management. This shows that individuals' financial knowledge cannot necessarily be optimally implemented through fintech platforms; in some cases, it can even trigger impulsive behavior. On the other hand, fintech successfully moderates the relationship between financial inclusion and personal financial management by weakening the negative influence that initially occurred.

The practical implications of this study emphasize the importance of developing financial education programs that are integrated with an understanding of the responsible use of fintech. For regulators and fintech service providers, these findings can be used as a reference in designing policies and service features that not only pursue access expansion but also ensure an increase in users' capabilities in managing their finances. For further research, it is recommended to explore other variables that may have an influence, as well as expand the scope of the research area to gain a more comprehensive understanding.

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