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The Effect of Financial Literacy, Financial Inclusion, Financial Technology, and Locus of Control on MSME Financial Behavior in Tangerang City

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Abstract: This study aims to analyze the effect of financial literacy, financial inclusion, financial technology (fintech), and locus of control on the financial behavior of micro, small, and medium enterprises (MSMEs) in Tangerang City. The background of this research is the vulnerability of MSMEs to business discontinuity, as indicated by survey evidence that most MSMEs can survive only a few months on their available capital. The study uses a quantitative approach with a causal research design, employing primary data collected through questionnaires distributed via Google Form to 400 MSME actors selected by random sampling, with the sample size determined using the Slovin formula. The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 3.0. The results indicate that financial literacy, financial inclusion, financial technology, and locus of control each have a positive and significant effect on MSME financial behavior. Financial literacy is identified as the most dominant variable, followed by locus of control, financial inclusion, and financial technology. The model explains 89.2% of the variance in financial behavior. In conclusion, strengthening financial knowledge, expanding access to financial services, encouraging fintech adoption, and fostering an internal sense of control can improve MSME financial behavior and support business sustainability.

Keywords: Financial Literacy, Financial Inclusion, Financial Technology, Locus of Control, Financial Behavior, MSMEs.

INTRODUCTION

Micro, small, and medium enterprises (MSMEs) are the backbone of the Indonesian economy. Indonesia has the largest number of MSMEs in ASEAN, estimated at around 65.5 million units in 2021, absorbing about 97% of the workforce, contributing 60.3% of gross

domestic product, and accounting for 14.4% of total exports (Ahdiat, 2023). Their role became even more prominent during the COVID-19 pandemic, when MSMEs absorbed workers displaced from formal sectors that suffered losses.

Despite this contribution, MSMEs remain financially fragile. Data from the Ministry of Cooperatives and SMEs show that People's Business Credit (KUR) grew by IDR 178.07 trillion (about 16.25%) in 2020 and IDR 192.59 trillion (about 8.16%) in 2021, which indicates strong demand for business capital. At the same time, a national MSME survey reports that 60.2% of MSMEs can survive on their capital for three months at most, and 21.34% for only one month. Weak financial behavior, such as poor budgeting, unrecorded expenses, and the absence of emergency funds, is widely regarded as a cause of business losses and failure, and it also makes it harder for MSMEs to obtain financing from formal institutions (Fatwitawati, 2018; Haningsih et al., 2023). Tangerang City, which hosts 506,347 MSMEs, is therefore an important setting for examining the determinants of MSME financial behavior.

Financial literacy is commonly regarded as the foundation of sound financial behavior because knowledge of saving, borrowing, insurance, and investment shapes how business owners manage money (Lusardi & Mitchell, 2014; Otoritas Jasa Keuangan, 2022). Financial inclusion, defined as access to and use of financial products and services, enables MSMEs to manage cash flow, finance expansion, and mitigate risk. Financial technology (fintech) lowers the cost of transactions and bookkeeping and can make financial management more efficient. Finally, locus of control, the degree to which individuals believe they control the outcomes of their lives (Rotter, 1966), is a psychological factor that may determine whether an owner takes active responsibility for the firm's finances.

Previous studies on these determinants have produced inconsistent results. Harahap et al. (2020) found that financial literacy had no effect on financial behavior while locus of control did, whereas Sucihati (2021) reported a significant effect of financial literacy. Findings on financial inclusion are also mixed (Astuti & Soleha, 2023), and the effect of fintech is positive in some studies (Anggraeni et al., 2023; Khofifah et al., 2022) but insignificant in others (Zikrillah et al., 2021). Studies by Mercu Buana researchers also show that financial inclusion and fintech each positively influence MSME financial behavior, and that fintech strengthens the effect of financial inclusion (Huda & Risman, 2024; Risman et al., 2023). Moreover, few studies integrate all four variables in a single model for MSMEs in a high-concentration area such as Tangerang City. In a related digital-finance setting, Simorangkir and Sari (2024) showed with PLS-SEM that financial literacy, ease of use, and security of e-wallets significantly shape students' financial behavior, which suggests that knowledge and technology perceptions work together.

This study draws on three complementary theories. Behavioral finance explains how psychological factors shape financial decisions (Nofsinger, 2001). The Theory of Planned Behavior (TPB) posits that behavior is determined by intention, attitude, subjective norms, and perceived behavioral control (Ajzen, 1991). The Technology Acceptance Model (TAM) explains the acceptance of technology through perceived usefulness and ease of use (Davis, 1989). Combining these perspectives, the study proposes four hypotheses: financial literacy (H1), financial inclusion (H2), financial technology (H3), and locus of control (H4) each have a positive effect on MSME financial behavior.

Accordingly, this study aims to analyze the effect of financial literacy, financial inclusion, financial technology, and locus of control on the financial behavior of MSMEs in Tangerang City. The findings are expected to benefit MSME owners, local government agencies such as the Department of Industry, Trade, Cooperatives, and SMEs of Tangerang City, and financial regulators in designing programs that strengthen MSME financial management.

METHODS

This study adopts a quantitative approach with a causal (explanatory) research design to test the cause-and-effect relationships between four independent variables (financial literacy, financial inclusion, financial technology, and locus of control) and one dependent variable (MSME financial behavior). The research was conducted in cooperation with the Department of Industry, Trade, Cooperatives, and Small and Medium Enterprises of Tangerang City, which facilitated access to MSME actors.

The population comprises all MSMEs domiciled in Tangerang City, totaling 506,347 units. The sample size was determined using the Slovin formula at a 5% margin of error, giving a minimum of 400 respondents, and respondents were selected by random sampling so that every unit had an equal chance of being included. Primary data were collected through a closed questionnaire distributed via Google Form, and partly in person with direct explanation to respondents, using a five-point Likert scale (1 = strongly disagree to 5 = strongly agree).

Financial behavior was measured through paying bills on time, preparing an expenditure budget, recording expenses, providing an emergency fund, saving periodically, and comparing prices before buying. Financial literacy was measured by general financial knowledge, savings and loans, insurance, and investment. Financial inclusion was measured by access to, use of, and quality of financial services. Financial technology was measured by ease of use, perceived benefits, transaction security, and frequency of use. Locus of control was measured through internal and external control beliefs.

Data were analyzed using PLS-SEM with SmartPLS 3.0, which is suitable for complex relationships among latent variables. The analysis began with descriptive statistics, followed by evaluation of the outer model (convergent validity with loading factor > 0.70 and AVE > 0.50, discriminant validity through cross loadings and the Fornell-Larcker criterion, and reliability through Cronbach's alpha and composite reliability > 0.70). The inner model was evaluated using R-square, and hypotheses were tested by bootstrapping with a one-tailed critical t-value of 1.645 and a p-value below 0.05 (Hair et al., 2019).

RESULTS AND DISCUSSION

Respondent Characteristics

Table 1 describes the 400 MSME actors in Tangerang City who participated in the study. Most respondents are aged 41–50 years (35.3%), hold a senior high school or vocational diploma (39.0%), are women (54.5%), and have operated their business for more than five years (64.5%). Just over half report annual revenue between IDR 50 million and IDR 500 million (53.5%), and the remainder earn less than IDR 50 million (46.5%).

Table 1. Respondent Characteristics (N = 400)

Characteristic	Category	Frequency	Percent
Age (years)	20–30	64	16.0
	31–40	104	26.0
	41–50	141	35.3
	51–60	61	15.3
	61–70	30	7.5
Education	Elementary school	37	9.2
	Junior high school	87	21.8
	Senior high/vocational school	156	39.0

	Higher education	120	30.0
Gender	Female	218	54.5
	Male	182	45.5
Annual revenue	Less than IDR 50 million	186	46.5
	IDR 50 million – IDR 500 million	214	53.5
Business age	1–3 years	40	10.0
	4–5 years	102	25.5
	More than 5 years	258	64.5

Measurement Model Evaluation

All 26 indicators have outer loadings above 0.70 (range 0.755–0.918), and the AVE of every construct exceeds 0.50, so convergent validity is satisfied. Cronbach's alpha and composite reliability for all constructs exceed 0.70, which shows that the instrument is reliable (Table 2).

Table 2. Convergent Validity and Reliability

Construct	Indicators	Loading range	AVE	Cronbach's Alpha	Composite Reliability
Financial Literacy (X1)	4	0.775–0.880	0.698	0.855	0.902
Financial Inclusion (X2)	5	0.755–0.918	0.727	0.905	0.930
Financial Technology (X3)	4	0.802–0.872	0.714	0.866	0.909
Locus of Control (X4)	7	0.788–0.905	0.731	0.938	0.950
Financial Behavior (Y)	6	0.789–0.896	0.721	0.922	0.939

Discriminant validity was first assessed with cross loadings: every indicator loads higher on its own construct than on any other construct. The Fornell-Larcker criterion, however, shows that several inter-construct correlations (for example, 0.912 between financial inclusion and financial behavior, and 0.904 between financial inclusion and locus of control) are higher than the square root of the AVE of the constructs involved (0.849–0.855). This indicates a considerable conceptual overlap among the constructs, which is common in perception-based MSME surveys, and is acknowledged as a limitation of this study.

Structural Model Evaluation and Hypothesis Testing

The R-square of financial behavior is 0.892, meaning that financial literacy, financial inclusion, financial technology, and locus of control jointly explain 89.2% of its variance, while the remaining 10.8% is explained by variables outside the model. This value is classified as substantial (Hair et al., 2019). Table 3 presents the bootstrapping results. All four path coefficients are positive and significant, with t-statistics above 1.645 and p-values below 0.05, so H1 to H4 are accepted.

Table 3. Hypothesis Testing Results

Hypothesis	Path	Path coefficient	t-statistic	p-value	Decision
H1	Financial Literacy → Financial Behavior	0.354	4.229	0.000	Accepted

H2	Financial Inclusion → Financial Behavior	0.291	2.803	0.005	Accepted
H3	Financial Technology → Financial Behavior	0.237	2.732	0.003	Accepted
H4	Locus of Control → Financial Behavior	0.310	3.247	0.001	Accepted

Financial literacy has the largest path coefficient (0.354), followed by locus of control (0.310), financial inclusion (0.291), and financial technology (0.237).

Discussion

The results show that financial literacy has a positive and significant effect on MSME financial behavior (β = 0.354; t = 4.229; p = 0.000), and it is the strongest determinant in the model. Business owners who understand saving, borrowing, insurance, and investment are better able to budget, record expenses, and manage debt responsibly. This is consistent with the Theory of Planned Behavior, in which knowledge and perceived capability strengthen the intention to act responsibly (Ajzen, 1991; Mahyarni, 2013), and with studies reporting a positive influence of financial literacy on financial behavior (Simorangkir & Sari, 2024; Sucihati, 2021; Tristiarto & Wahyudi, 2022). The finding differs from Harahap et al. (2020), who found no effect, which suggests that the effect of literacy depends on the respondent profile; in this study, 69.0% of respondents have at least a senior high school education.

Financial inclusion also has a positive and significant effect (β = 0.291; t = 2.803; p = 0.005). Among its indicators, the highest loading is found on the item concerning the selection of financial products used (X2.4 = 0.918). MSMEs that can access and choose suitable products, such as business accounts, loans, and insurance, are better equipped to manage cash flow, finance expansion, and handle financial risk. From a behavioral finance perspective, financial behavior is an individual response to financial information and opportunities (Nofsinger, 2001), so wider access gives owners more room to practice disciplined financial management. This result supports Astuti and Soleha (2023), who link financial inclusion to MSME financial behavior in Indonesia, and it agrees with Risman et al. (2023) and Huda and Risman (2024), who report a positive effect of financial inclusion on the financial behavior of MSMEs.

Financial technology has a positive and significant effect (β = 0.237; t = 2.732; p = 0.003), although it is the weakest of the four determinants. Fintech tools such as digital payments and bookkeeping applications record transactions automatically and make them more accurate, which supports habits such as recording expenses and paying bills on time. The result is consistent with the Technology Acceptance Model, in which perceived usefulness and ease of use drive technology adoption and, in turn, usage behavior (Davis, 1989; Purwanto & Budiman, 2020; Simorangkir & Sari, 2024), and it supports Anggraeni et al. (2023), Khofifah et al. (2022), Risman et al. (2023), and Huda and Risman (2024). It contrasts with Zikrillah et al. (2021), who found no significant effect. The smaller coefficient may reflect uneven digital capability among owners, as 31.0% of respondents have completed only elementary or junior high school.

Locus of control has a positive and significant effect on financial behavior (β = 0.310; t = 3.247; p = 0.001). Owners who believe that outcomes depend on their own efforts are more willing to plan, set aside funds, and act on financial ideas, rather than attributing results to luck or other people (Rotter, 1966). This matches the role of perceived behavioral control in the Theory of Planned Behavior (Ajzen, 1991) and is in line with Budiasni and Ferayani (2023), Harahap et al. (2020), and Setianingsih et al. (2022).

Three points deserve caution. First, the R-square of 0.892 is very high, and the Fornell-Larcker results indicate overlapping constructs; the structural estimates should therefore be read as associations among perceptions, and future studies should confirm discriminant validity with the heterotrait-monotrait (HTMT) ratio. Second, all variables were measured by self-reported questionnaires at a single point in time, which may inflate relationships through common-method bias. Third, the sample is limited to Tangerang City, so generalization to other regions should be made carefully.

CONCLUSION

This study demonstrates that financial literacy, financial inclusion, financial technology, and locus of control each have a positive and statistically significant effect on the financial behavior of MSMEs in Tangerang City, and together they explain 89.2% of its variance. Financial literacy is the most dominant determinant ($\beta = 0.354$), followed by locus of control ($\beta = 0.310$), financial inclusion ($\beta = 0.291$), and financial technology ($\beta = 0.237$). These findings support the Theory of Planned Behavior, behavioral finance, and the Technology Acceptance Model as a combined explanation of MSME financial behavior.

Practically, MSME owners should strengthen their financial knowledge, use appropriate financial products, adopt fintech for recording and payments, and cultivate a belief that they are responsible for their business outcomes. The Department of Industry, Trade, Cooperatives, and SMEs of Tangerang City and financial regulators can prioritize financial literacy training, widen access to suitable financial services, and provide digital bookkeeping assistance. Future research should add variables outside the model (such as business experience, financial attitude, and access to financing), confirm discriminant validity with the HTMT ratio, compare MSMEs across regions, and use longitudinal or mixed-method designs to reduce common-method bias.

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