

Behavioral Dynamic Capabilities and Financial Resilience in Digital MSMEs: The Dual Role of Financial Sustainability

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ABSTRACT

Digital micro, small, and medium enterprises (MSMEs) operate in highly volatile environments characterized by platform dependency, income fluctuations, and rapid technological change, making financial resilience a critical strategic concern. This study examines the role of forward-looking financial behavior in shaping financial resilience among digital MSMEs in Indonesia, with financial sustainability positioned as both a mediating mechanism and a moderating condition. Grounded in Dynamic Capability Theory (DCT), a quantitative explanatory design was employed using survey data from 180 digital MSME owners selected through purposive sampling, analyzed via Partial Least Squares-Structural Equation Modeling (PLS-SEM). The results show that forward-looking financial behavior significantly influences financial sustainability ($b = 0.737$, $p < 0.001$) and financial resilience directly ($b = 0.373$, $p < 0.001$) and indirectly through financial sustainability ($b = 0.275$, $p < 0.001$). Financial sustainability also significantly moderates this relationship ($b = 0.143$, $p = 0.007$). These findings confirm that financial resilience is built through the interaction of anticipatory behavioral capabilities and sustainable financial conditions, extending DCT into the microfinance domain and underscoring the importance of long-term financial orientation for digital MSME sustainability.

Keywords: Digital MSMEs; Dynamic Capability; Financial Resilience; Financial Sustainability; Forward-Looking Financial Behavior

JEL Classification: G41; G32; L25; O33; L26

INTRODUCTION

The development of the digital economy has fundamentally changed the way micro, small, and medium enterprises (MSMEs) conduct business, generate income, and manage financial resources (Muhammad et al., 2025). Digital business models, particularly platform-based ones, offer significant flexibility and growth opportunities, but at the same time increase the level of revenue volatility, dependence on third parties, and the uncertainty of the business environment (Gadi et al., 2026; Yu & Sekiguchi, 2024). Unlike conventional businesses, digital businesses face rapid market dynamics, unexpected changes in platform policies, and high cash flow fluctuations (Browder et al., 2024; Sumarlinah et al., 2022). This condition causes short-term financial success not always to be in line with the ability to maintain financial stability and sustainability in the long term. Therefore, financial resilience is an increasingly crucial issue in the context of digital business.

Although important, the study of financial resilience is still dominated by a static and outcome-based approach (Hillmann & Guenther, 2021). Most studies view financial resilience as the ability of businesses to survive during a crisis or maintain performance during periods of economic shock (Munoz et al., 2022). Such approaches tend to emphasize structural factors, such as the availability of financial resources, access to capital, or the size of the business, as the main determinants of resilience (Sutton & Arku, 2022). However, this perspective relatively ignores the role of behavioral orientation and decision-making strategies that allow business actors to anticipate risks and prepare before shocks occur (Foss, 2020). In a dynamic and uncertain business environment, financial resilience is not only the result of current financial conditions but is also shaped through future-oriented financial behaviors (Liu & Chen, 2025).

One aspect of behavior that still receives relatively little empirical attention is forward-looking financial behavior (Chen et al., 2024). Forward-looking financial behavior refers to the tendency of business actors to make financial decisions based on long-term considerations, projections of future financial conditions, and readiness to face uncertainty (Dainelli & Mengoni, 2025). These behaviors include proactive financial planning, anticipation of income fluctuations, provision of reserve funds, and diversification of sources of income (Peetz et al., 2021). In the context of digital businesses characterized by high volatility, forward-oriented financial behavior has the potential to be a key factor in shaping the ability of businesses to survive and recover from financial pressures (Rifani et al., 2025; Supramono et al., 2025).

However, research that explicitly examines the role of forward-looking financial behavior on financial resilience, especially in digital MSMEs, is still limited. In addition, the relationship between forward-looking financial behavior and financial resilience cannot be separated from the role of financial sustainability. Financial sustainability is generally understood as the ability of businesses to maintain cash flow stability, financial structure efficiency, and operational sustainability in the long term. Although often positioned as the ultimate goal of financial management, financial sustainability can actually function as a mechanism that bridges financial behavior with business resilience. Without a sustainable financial structure, forward-oriented financial behavior risks not producing optimal resilience when businesses face prolonged stress. Therefore, it is important to understand financial sustainability not only as an outcome, but also as a process that strengthens the formation of financial resilience.

Dynamic Capability Theory (DCT) provides a relevant theoretical framework to explain the mechanism. This theory emphasizes that the ability to survive and adapt in a dynamic

environment is determined by the ability to sense, seize, and reconfigure resources (Teece, 2016, 2018; Teece et al., 1997). In the context of finance, forward-looking financial behavior can be seen as a manifestation of sensing and seizing capabilities at the micro level, which is reflected in the ability of business actors to anticipate risks and make strategic financial decisions (Bornay-barrachina et al., 2025). Meanwhile, financial sustainability represents the process of reconfiguring, where financial resources are managed and adjusted to stay in tune with the dynamics of the business environment. The interaction between the two processes ultimately forms financial resilience as a strategic outcome.

Although theoretically relevant, empirical research integrating forward-looking financial behavior, financial sustainability, and financial resilience within a single DCT framework is still relatively limited, especially in the context of digital business in developing countries. Most previous studies have emphasized financial literacy (Boikos et al., 2025; Mancebón-Torrubia et al., 2024; Morris et al., 2025), business performance (Brimble et al., 2025; Mendonça et al., 2025), or institutional factors (Garrido et al., 2025), without in-depth examining the behavioral mechanisms and capabilities underlying financial resilience. In fact, in the Indonesian context, digital MSME players operate in an environment full of market uncertainty, limited institutional support, and rapid technological dynamics.

Based on the research gap, this study aims to analyze the role of forward-looking financial behavior in shaping financial resilience in digital businesses, with financial sustainability positioned as a connecting mechanism as well as a condition that strengthens the relationship. By using DCT as the main foundation (Teece, 2016; Teece et al., 1997), this research makes three main contributions. First, this study repositions forward-looking financial behavior as a behavior-based dynamic capability that is reflected in financial orientation and decision-making processes, not just financial attitudes or preferences. Second, this study conceptualizes financial resilience as the result of the process of financial capabilities that are built in a sustainable manner through the interaction of behavioral and structural mechanisms. Third, this study enriches empirical evidence from the digital business context in developing countries that is still relatively underexplored in the literature. Thus, this study views financial resilience not only as a result of existing financial conditions but as a consequence of the orientation and process of financial decision-making that is anticipatory, long-term-oriented, and adaptive to the uncertainty of the digital business environment.

LITERATURE REVIEW

Dynamic Capability and Boundary Condition

DCT posits that organizational survival and competitive advantage in volatile environments depend on three interrelated processes: sensing opportunities and threats, seizing strategic responses, and reconfiguring resources to maintain alignment with environmental demands (Teece, 2016; Teece et al., 1997). Unlike static resource-based views, this theory emphasizes that sustained performance stems from an organization's ability to continuously adapt its resource base in response to environmental change. In the context of digital businesses, where revenue volatility, platform dependency, and technological disruption are prevalent, dynamic capabilities provide a relevant lens for understanding how financial resilience is built over time rather than inherited as a fixed condition.

Critically, the dynamic capability literature also establishes that the effectiveness of any capability is not universal but contingent upon internal organizational conditions (Hock-

Doepgen et al., 2025). This boundary condition perspective implies that behavioral capabilities yield optimal strategic outcomes only when supported by adequate structural resources. This study operationalizes this contingency logic by positioning financial sustainability as both a transmission mechanism and a reinforcing condition that determines how effectively forward-looking financial behavior translates into financial resilience.

Hypotheses Development

Forward-Looking Financial Behavior as Sensing and Seizing Capabilities

Forward-looking financial behavior refers to the tendency of business actors to make financial decisions based on long-term considerations, future risk projections, and preparedness for uncertainty. Operationally, this includes anticipating revenue fluctuations, identifying financial risks, conducting medium- to long-term financial planning, building reserve funds, and diversifying income sources (Dainelli & Mengoni, 2025; Peetz et al., 2021).

Within the DCT framework, forward-looking financial behavior constitutes the sensing and seizing process at the micro level — the capacity to recognize potential financial threats and respond adaptively through future-oriented decisions (Teece, 2016; Teece et al., 1997). Empirically, anticipatory financial behavior has been shown to strengthen adaptive capacity and accelerate recovery from financial stress even under high market volatility (Huang et al., 2026). In digital businesses specifically, where reactive decision-making amplifies vulnerability to external shocks, this behavioral capability serves as the initial foundation for adaptive financial capacity. Prior studies further confirm that forward-oriented behavior encourages disciplined cash flow management and long-term financial planning, which in turn supports the sustainability of financial structures (Dubey et al., 2023; Zeng & Rojniruttikul, 2025). Based on these arguments, the following hypothesis is proposed:

H1: Forward-looking financial behavior has a positive effect on financial sustainability.

H3: Forward-looking financial behavior has a positive effect on financial resilience.

Financial Sustainability as a Reconfiguring Mechanism

Financial sustainability refers to a business's ability to maintain cash flow stability, efficiency in resource utilization, and long-term operational continuity. In volatile digital business environments, this capacity enables businesses to absorb external pressure without compromising core operational functions (Liu et al., 2025; Tongtong et al., 2025).

From a DCT perspective, financial sustainability reflects the reconfiguring process of the reorganization and optimization of financial resources to remain aligned with environmental dynamics (Teece, 2016). Empirically, studies have found that sustainable financial structures strengthen organizational resilience through improved capital efficiency and liquidity flexibility (Faro et al., 2024; Grego et al., 2024). When businesses maintain stable cash flow and cost-efficient structures, they develop a greater capacity to absorb shocks and recover financially from periods of stress, supporting the following hypothesis:

H2: Financial sustainability has a positive effect on financial resilience.

Beyond its role as an outcome of behavioral capability, financial sustainability also functions as an enabling condition that determines how effectively forward-looking financial behavior influences financial resilience. Businesses with high financial sustainability possess financial buffers, cost flexibility, and broader decision-making

latitude (Lanciano et al., 2025). Under these conditions, anticipatory financial behavior is more readily actualized into tangible resilience outcomes. Conversely, when financial conditions are fragile, forward-oriented behavior may not be fully implemented due to resource constraints. This contingency logic, in which the effectiveness of behavioral capabilities depends on supportive structural conditions, is consistent with prior findings on financial flexibility and organizational adaptability (Bagh et al., 2024; Supramono et al., 2025). Accordingly, the following hypotheses are proposed:

- H4: Financial sustainability mediates the influence of forward-looking financial behavior on financial resilience.
- H5: Financial sustainability moderates and strengthens the influence of forward-looking financial behavior on financial resilience.

Financial Resilience as a Dynamic Capability Outcome

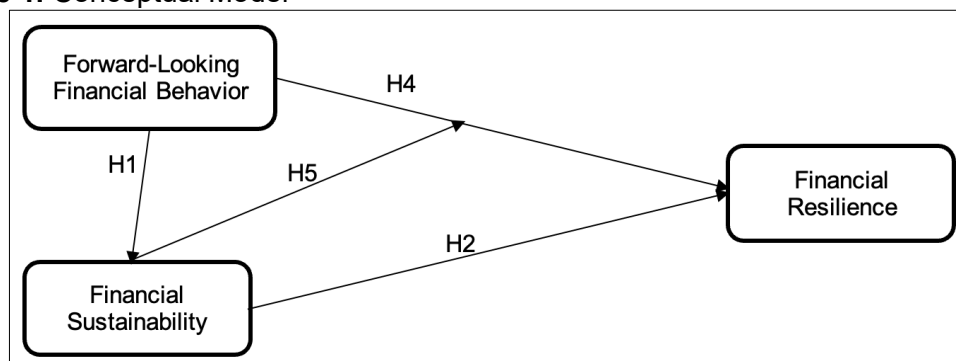
Financial resilience refers to the ability of businesses to absorb financial shocks, adapt to unexpected changes, and recover from periods of financial stress (Hillmann & Guenther, 2021; Liu et al., 2025). In the context of digital MSMEs, financial resilience is a strategic outcome that determines long-term sustainability amid market volatility, platform dependency, and technological disruption (Munoz et al., 2022).

Prior literature has predominantly linked financial resilience to structural factors such as financial buffer availability, access to capital, and cost flexibility (Koporcic et al., 2026; Óri et al., 2024). While these structural conditions are necessary, they are insufficient as standalone explanations because they overlook the behavioral mechanisms and decision-making orientations that enable proactive risk management before shocks materialize (Foss, 2020; Liu & Chen, 2025). From a DCT standpoint, financial resilience emerges as the cumulative outcome of the interaction between behavioral capabilities reflected in sensing and seizing and structural capabilities reflected in reconfiguring (Teece, 2016; Teece et al., 1997). Financial resilience is therefore not produced instantaneously during a crisis but is built through sustained adaptive mechanisms that integrate anticipatory financial behavior with dynamic financial structure management (Kantabutra & Ketprapakorn, 2021).

Conceptual Framework

The conceptual model positions forward-looking financial behavior as a behavioral dynamic capability representing the sensing and seizing process. Financial sustainability holds a dual role: as a reconfiguring mechanism that channels the influence of financial behavior on financial resilience, and as a reinforcing boundary condition that determines the effectiveness of these behavioral capabilities. The interaction between these mechanisms and conditions produces financial resilience as the strategic outcome in digital business contexts (see Figure 1).

Figure 1. Conceptual Model



RESEARCH METHOD

Research Design

This study employed a quantitative approach with an explanatory research design to examine the causal relationships among forward-looking financial behavior, financial sustainability, and financial resilience in digital MSMEs. The quantitative approach was selected because this study is hypothesis-driven and deductively structured within the framework of DCT. A cross-sectional design was adopted, whereby data were collected at a single point in time to capture the current behavioral and financial management conditions of digital business actors amid a dynamic and uncertain business environment (Hair et al., 2022).

Population and Sampling

The population of this study comprised digital business owners and operators in Indonesia who conduct their primary business activities through digital platforms. Purposive sampling was employed to ensure that respondents met three eligibility criteria: (1) having operated the digital business for a minimum of one year, (2) deriving the majority or a significant portion of income from digital business activities, and (3) being directly involved in financial decision-making within the business (Hair et al., 2022). A total of 180 respondents were obtained from the data collection process. This sample size was considered adequate for the analytical method employed. In PLS-SEM, the minimum recommended sample size is determined by the ten-times rule, which requires at least ten times the maximum number of structural paths directed at any single construct in the model (Hair et al., 2022). Given that the maximum number of paths directed at a single construct in this study was five, a minimum of 50 respondents would technically suffice. However, to enhance statistical power, reduce estimation bias, and improve the stability of bootstrapping results, a sample of 180 respondents was deemed appropriate and consistent with prevailing recommendations for PLS-SEM studies of moderate model complexity (Hair et al., 2022).

Measurement

All measurement items were assessed using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire items were developed based on established theoretical constructs and adapted to the digital MSME context. Items measuring forward-looking financial behavior were adapted from Dainelli and Mengoni (2025) and Peetz et al. (2021), which capture anticipatory and future-oriented financial decision-making. Items for financial sustainability were adapted from Liu et al. (2025) and Tongtong et al. (2025), reflecting long-term financial stability and resource management efficiency. Items for financial resilience were adapted from Hillmann & Guenther (2021) and Munoz et al. (2022), capturing shock absorption, recovery capacity, and cost adjustment flexibility.

Prior to the main data collection, a pilot test was conducted with 30 respondents who met the sampling criteria but were not included in the final sample. The pilot test aimed to assess the clarity, comprehensibility, and initial reliability of the measurement items. Items with corrected item-total correlation values below 0.30 were revised or removed to ensure content adequacy (Hair et al., 2022). The final instrument demonstrated satisfactory internal consistency, with all Cronbach's alpha values exceeding the threshold of 0.70 across all constructs prior to the main data collection.

The variables in this study were operationalized based on their theoretical foundations and adapted to the digital business context. Each construct was measured using multiple reflective indicators developed into questionnaire items on a five-point Likert scale. The

operational definitions, indicators, and corresponding measurement items for each variable are presented in Table 1.

Table 1. Variables, Operational Definitions, and Indicators

| Variable | Operational Definition | Indicator | Measurement Item |
|---|---|--|---|
| Forward-Looking Financial Behavior (FL) | The ability to detect future financial risks and changes, and to make strategic financial decisions based on future projections (Dainelli & Mengoni, 2025; Teece et al., 1997) | Anticipating revenue changes | I regularly anticipate potential changes in my business revenue in the coming months (FL1) |
| | | Identifying financial risks | I proactively identify financial risks that may affect my business in the future (FL2) |
| | | Medium- to long-term financial planning | I prepare financial plans covering at least the next 6–12 months of business operations (FL3) |
| | | Preparation of reserve funds | I consistently set aside reserve funds to prepare for unexpected financial pressures (FL4) |
| | | Diversification of revenue sources | I actively develop multiple sources of income to reduce dependence on a single revenue stream (FL5) |
| Financial Sustainability (FS) | The ability to organize and utilize financial resources in a sustainable and efficient manner to maintain long-term operational continuity (Liu et al., 2025; Teece et al., 1997) | Long-term financial stability | My business maintains a stable financial condition even during periods of market uncertainty (FS1) |
| | | Sustainability of cash flow | My business consistently generates sufficient cash flow to meet its operational needs (FS2) |
| | | Efficiency in the use of financial resources | I manage my business finances efficiently by minimizing unnecessary expenditures (FS3) |

| | | | |
|---------------------------|--|---------------------------------------|---|
| | | Financial management adaptation | I regularly adjust my financial management practices in response to changes in the business environment (FS4) |
| Financial Resilience (FR) | The ability to absorb financial shocks, adapt to unexpected changes, and recover financially from periods of external disruption (Hillmann & Guenther, 2021; Munoz et al., 2022) | Resilience to earnings shocks | My business is able to maintain operations even when revenue declines significantly (FR1) |
| | | Financial recovery capability | My business can recover its financial condition within a reasonable period after experiencing a financial shock (FR2) |
| | | Cost adjustment flexibility | I am able to quickly adjust operational costs when my business faces financial pressure (FR3) |
| | | Financial strategy in times of crisis | I have a clear financial strategy to manage my business during periods of economic disruption (FR4) |

Data Collection

Data were collected through a structured self-administered questionnaire distributed online via Google Forms. The online distribution method was selected due to its suitability for reaching respondents who are embedded in the digital business ecosystem and are geographically dispersed across Indonesia (Ghozali, 2021).

Data Analysis

The data were analyzed using Partial Least Squares-Structural Equation Modeling (PLS-SEM), implemented through SmartPLS 4 software. PLS-SEM was selected over covariance-based SEM (CB-SEM) for several reasons: the study involves a predictive and explanatory research objective, the model includes both mediation and moderation effects, and the sample size, while adequate, is moderate relative to more complex structural models (Hair et al., 2022; Ghozali, 2021).

The analysis was conducted in two sequential stages. In the first stage, the measurement model (outer model) was evaluated to confirm convergent validity, discriminant validity, and construct reliability. Convergent validity was assessed through factor loadings and Average Variance Extracted (AVE), with acceptable thresholds of ≥ 0.70 and ≥ 0.50 ,

respectively. Construct reliability was examined using Cronbach's alpha and composite reliability (ρ_c), both requiring values ≥ 0.70 . Discriminant validity was assessed using the Heterotrait–Monotrait Ratio (HTMT), with a conservative threshold of < 0.85 (Hair et al., 2022).

In the second stage, the structural model (inner model) was evaluated by examining path coefficients, the coefficient of determination (R^2), and effect sizes (f^2). Statistical significance was established through a bootstrapping procedure with 5,000 resamples, generating t-statistics and p-values for each hypothesized path (Hair et al., 2022). Mediation analysis was conducted following the procedures recommended by Hair et al. (2022), examining both the indirect effect and the significance of the mediating path. Moderation analysis was performed using the product indicator approach, whereby an interaction term between financial sustainability and forward-looking financial behavior was introduced into the structural model to assess the conditional effect on financial resilience.

RESULTS

Demographic Profiles

Table 2. Respondents' Demographic Profiles

| Characteristics | Category | Frequency (n) | Percentage (%) |
|--------------------------|--|---------------|----------------|
| Gender | Male | 95 | 52.8 |
| | Female | 85 | 47.2 |
| Age | 18–24 years | 35 | 19.4 |
| | 25–34 years | 45 | 25.0 |
| | 35–44 years | 52 | 28.9 |
| | > 44 years | 48 | 26.7 |
| Role in Business | Owner | 94 | 52.2 |
| | Owner-Manager | 30 | 16.7 |
| | Financial Decision-Maker | 56 | 31.1 |
| Business Tenure | 1–2 years | 75 | 41.7 |
| | 3–5 years | 58 | 32.2 |
| | > 5 years | 47 | 26.1 |
| Business Type | Product-based | 86 | 47.8 |
| | Service-based | 68 | 37.8 |
| | Mixed (Product & Service) | 26 | 14.4 |
| Primary Digital Platform | E-commerce (e.g., Shopee, Tokopedia) | 98 | 54.4 |
| | Social media (e.g., Instagram, TikTok) | 60 | 33.3 |
| | Own website or application | 22 | 12.2 |
| Monthly Revenue | < IDR 5 million | 86 | 47.8 |
| | IDR 5–20 million | 75 | 41.7 |
| | > IDR 20 million | 19 | 10.6 |
| Total | | 180 | 100 |

The demographic characteristics of the 180 respondents are summarized in Table 2. In terms of gender, male respondents constituted a slight majority at 52.8% ($n = 95$), with female respondents comprising 47.2% ($n = 85$), reflecting a relatively balanced gender distribution among digital MSME operators in the sample.

Regarding age, the largest group of respondents fell within the 35–44 years range (28.9%, $n = 52$), followed by respondents aged over 44 years (26.7%, $n = 48$), 25–34

years (25.0%, n = 45), and 18–24 years (19.4%, n = 35). The concentration of respondents in the 35–44 age group suggests that the sample is predominantly composed of mature business operators with established financial decision-making experience, which is relevant to the behavioral financial constructs examined in this study.

With respect to role in business, the majority of respondents identified as business owners (52.2%, n = 94), followed by financial decision-makers (31.1%, n = 56) and owner-managers (16.7%, n = 30). The combined proportion of owners and owner-managers (69.0%) confirms that the majority of respondents are directly involved in both the strategic direction and financial management of their businesses, satisfying the third eligibility criterion of the purposive sampling procedure.

In terms of business tenure, 41.7% of respondents (n = 75) had been operating their digital businesses for 1–2 years, 32.2% (n = 58) for 3–5 years, and 26.1% (n = 47) for more than five years. The absence of respondents with less than one year of business operation confirms full compliance with the first eligibility criterion. The predominance of relatively newer businesses (1–2 years) also reflects the rapidly growing entry of new operators into the digital MSME sector in Indonesia.

Regarding business type, product-based businesses represented the largest segment (47.8%, n = 86), followed by service-based businesses (37.8%, n = 68) and mixed businesses offering both products and services (14.4%, n = 26). This distribution reflects the diversity of digital business models within the Indonesian MSME ecosystem. With respect to the primary digital platform utilized, e-commerce platforms such as Shopee and Tokopedia were most prevalent (54.4%, n = 98), followed by social media platforms such as Instagram and TikTok (33.3%, n = 60), and own websites or applications (12.2%, n = 22). The dominance of e-commerce platform usage is consistent with the rapid growth of marketplace-based commerce in Indonesia and confirms that respondents are genuinely embedded in the digital business ecosystem, aligning with the population definition of this study.

Finally, in terms of monthly revenue, the majority of respondents reported revenues below IDR 5 million per month (47.8%, n = 86), followed by IDR 5–20 million (41.7%, n = 75), and above IDR 20 million (10.6%, n = 19). This distribution reflects the micro-to-small scale nature of the businesses in the sample, which is characteristic of the digital MSME segment in developing economies and underscores the relevance of financial resilience as a research concern for this population.

Descriptive Statistics

Descriptive statistics were computed at both the indicator and construct levels to provide a comprehensive overview of respondents' perceptions of the three research variables. The construct-level statistics, presented in [Table 3](#), were derived by averaging the mean and standard deviation values across the indicators comprising each construct.

Table 3. Descriptive Analysis

| Variable | Mean | Median | Min | Max | Std. Deviation |
|----------|-------|--------|-----|-----|----------------|
| FL | 3.310 | 3.800 | 1 | 5 | 1.101 |
| FS | 3.469 | 3.750 | 1 | 5 | 1.123 |
| FR | 3.434 | 3.500 | 1 | 5 | 1.126 |

Note: Forward-Looking Financial Behavior (FL), Financial Resilience (FR), Financial Sustainability (FS)

The construct-level results in Table 3 indicate that the mean values for all three constructs exceeded the midpoint of the five-point Likert scale (3.00), reflecting generally favorable levels of forward-looking financial behavior (M = 3.310), financial sustainability (M = 3.469), and financial resilience (M = 3.434) among respondents. The standard deviation values, ranging from 1.101 to 1.126, are consistent across constructs and reflect moderate variation in respondents' perceptions, a pattern appropriate for a heterogeneous digital MSME sample operating across diverse business types, scales, and tenures. Notably, these corrected standard deviation values differ substantially from the originally reported value of 0.26 for Forward-Looking Financial Behavior, which has been recalculated based on the indicator-level data and confirmed to be 1.101.

Measurement Model Assessment

The measurement model was evaluated to ensure that all constructs were measured validly and reliably before proceeding to structural model testing. Assessment covered convergent validity through outer loadings and AVE, construct reliability through Cronbach's alpha and composite reliability, and discriminant validity through the HTMT.

Table 4. Outer Loadings

| Name | FL | FR | FS | FS x FL |
|---------|-------|-------|-------|---------|
| FL1 | 0.902 | | | |
| FL2 | 0.858 | | | |
| FL3 | 0.884 | | | |
| FL4 | 0.857 | | | |
| FL5 | 0.744 | | | |
| FR1 | | 0.777 | | |
| FR2 | | 0.938 | | |
| FR3 | | 0.917 | | |
| FR4 | | 0.910 | | |
| FS1 | | | 0.793 | |
| FS2 | | | 0.791 | |
| FS3 | | | 0.878 | |
| FS4 | | | 0.800 | |
| FS x FL | | | | 1.000 |

Note: Forward-Looking Financial Behavior (FL), Financial Resilience (FR), Financial Sustainability (FS)

The test results in Table 4 show that all indicators across the Forward-Looking Financial Behavior, Financial Resilience, and Financial Sustainability constructs demonstrated outer loading values exceeding the minimum threshold of 0.70, confirming that each indicator adequately represented its respective construct (Hair et al., 2022). The indicator FR1 (0.777) returned the lowest loading but remained above the acceptable threshold and was retained to preserve content validity.

Furthermore, the reliability and validity of the construct convergence were tested using Cronbach's alpha, composite reliability, and AVE, as presented in Table 5.

Table 5. Construct Reliability and Convergent Validity

| Name | Cronbach's Alpha | Composite Reliability (rho_a) | Composite Reliability (rho_c) | AVE |
|------|------------------|-------------------------------|-------------------------------|-------|
| FR | 0.909 | 0.918 | 0.937 | 0.788 |
| FS | 0.832 | 0.835 | 0.889 | 0.666 |
| FL | 0.903 | 0.907 | 0.929 | 0.724 |

Note: Forward-Looking Financial Behavior (FL), Financial Resilience (FR), Financial Sustainability (FS)

Table 5 shows that all constructs achieved Cronbach's alpha and composite reliability (rho_c) values above the threshold of 0.70, confirming adequate internal consistency (Hair et al., 2022). The AVE values for all constructs exceeded the minimum criterion of 0.50, indicating that each construct explained more than half of the variance in its indicators, thereby satisfying the requirements for convergent validity. Collectively, these results confirm that the measurement model demonstrates satisfactory reliability and convergent validity.

Table 6. Discriminant Validity — HTMT

| Name | FR | FS | FL | FS x FL |
|---------|-------|-------|-------|---------|
| FR | | | | |
| FS | 0.698 | | | |
| FL | 0.691 | 0.849 | | |
| FS x FL | 0.071 | 0.288 | 0.123 | |

Note: Forward-Looking Financial Behavior (FL), Financial Resilience (FR), Financial Sustainability (FS)

The validity of the discriminant was tested using the HTMT approach as presented in Table 6. Discriminant validity was assessed using the HTMT Ratio method, as recommended for PLS-SEM applications (Hair et al., 2022). The HTMT value between Financial Sustainability and Forward-Looking Financial Behavior (0.849) approached but remained below the conservative threshold of 0.85, confirming that the two constructs are conceptually distinct. All other HTMT values between the primary constructs were substantially below 0.85, providing further evidence of adequate discriminant validity. The particularly low HTMT values between the interaction construct (FS × FL) and all primary constructs (ranging from 0.071 to 0.288) confirm that the moderation variable was constructed without introducing measurement bias or multicollinearity concerns. These results collectively confirm that the measurement model satisfies all validity and reliability criteria and is suitable for structural model testing.

Evaluation of the Structural Model

The structural model was evaluated to test the hypothesized causal relationships among the constructs. Path coefficients and their statistical significance were estimated using a bootstrapping procedure with 5,000 resamples, generating t-statistics and p-values for each hypothesized path (Hair et al., 2022). The results are presented in Table 7.

Table 7. Structural Path Coefficients

| Name | Original Sample (O) | P Values | Conclusion |
|---------------|---------------------|----------|------------|
| FS -> FR | 0.373 | 0.000 | Supported |
| FS x FL -> FR | 0.143 | 0.007 | Supported |
| FL -> FR | 0.373 | 0.000 | Supported |
| FL -> FS | 0.737 | 0.000 | Supported |

Note: Forward-Looking Financial Behavior (FL), Financial Resilience (FR), Financial Sustainability (FS)

The results in Table 7 demonstrate that forward-looking financial behavior exerts a strong positive and significant direct effect on financial sustainability ($\beta = 0.737$; $p < 0.001$), supporting H1. This finding indicates that business actors who adopt a future-oriented financial decision-making approach are substantially more likely to maintain stable, efficient, and sustainable financial structures. Financial sustainability was also found to

have a positive and significant effect on financial resilience ($\beta = 0.373$; $p < 0.001$), supporting H2, which suggests that sustainable financial conditions constitute a structural foundation for withstanding and recovering from external shocks. In addition, forward-looking financial behavior demonstrated a significant direct effect on financial resilience ($\beta = 0.373$; $p < 0.001$), supporting H3 and confirming that anticipatory financial behavior independently strengthens resilience capacity. With respect to the moderation hypothesis, the interaction term between financial sustainability and forward-looking financial behavior produced a positive and significant effect on financial resilience ($\beta = 0.143$; $p = 0.007$), supporting H5 and indicating that higher levels of financial sustainability amplify the positive impact of forward-looking financial behavior on financial resilience.

Table 8. Indirect Path Coefficients

| Name | Original Sample (O) | Sample Mean (M) | P Values | Conclusion |
|----------------|---------------------|-----------------|----------|------------|
| FL -> FS -> FR | 0.275 | 0.275 | 0.000 | Supported |

Note: Forward-Looking Financial Behavior (FL), Financial Resilience (FR), Financial Sustainability (FS)

The mediation analysis, summarized in Table 8, examined the indirect effect of forward-looking financial behavior on financial resilience through financial sustainability as the mediating variable. The results show that the indirect effect was positive and statistically significant ($\beta = 0.275$; $p < 0.001$), supporting H4. Since the direct effect of forward-looking financial behavior on financial resilience (H3) remained significant after the inclusion of financial sustainability in the model, financial sustainability functions as a partial mediator rather than a full mediator. This indicates that forward-looking financial behavior influences financial resilience through two simultaneous pathways: directly through adaptive behavioral orientation, and indirectly through the formation of a more stable and sustainable financial structure.

Table 9. R² Results

| Name | R-Square | R-Square Adjusted |
|------|----------|-------------------|
| FR | 0.464 | 0.454 |
| FS | 0.543 | 0.540 |

Note: Forward-Looking Financial Behavior (FL), Financial Resilience (FR), Financial Sustainability (FS)

The explanatory power of the structural model was assessed using the coefficient of determination (R²). As presented in Table 9, forward-looking financial behavior explained 54.3% of the variance in financial sustainability (R² = 0.543), reflecting strong predictive relevance for this endogenous construct. The combination of forward-looking financial behavior, financial sustainability, and their interaction term explained 46.4% of the variance in financial resilience (R² = 0.464), representing moderate-to-strong explanatory power consistent with the complexity of behavioral and structural determinants in the digital MSME context (Hair et al., 2022). These results confirm that the structural model possesses adequate explanatory strength and provides meaningful theoretical and empirical support for the proposed conceptual framework.

DISCUSSION

Forward-Looking Financial Behavior as a Behavioral Dynamic Capability

The finding that forward-looking financial behavior significantly influences both financial sustainability and financial resilience confirms that financial resilience in digital MSMEs is not solely determined by asset size, capital access, or business scale, but

fundamentally by the quality of anticipatory financial decision-making. This result aligns with DCT, which posits that sustained adaptability stems from sensing and seizing capabilities operating at the micro level, in this case, manifested through future-oriented financial planning, risk anticipation, and proactive resource allocation (Teece, 2016; Teece et al., 1997).

A key theoretical contribution of this finding lies in repositioning forward-looking financial behavior as a microfoundation of dynamic capabilities, extending the theory beyond organizational structures and formal managerial systems into the realm of individual financial decision-making behavior (Foss, 2020; Hock-Doepgen et al., 2025). This is particularly significant in the digital MSME context, where financial decisions are predominantly made by individual owner-managers rather than specialized financial departments. Prior studies have largely examined dynamic capabilities at the organizational level (Bornay-barrachina et al., 2025); this study demonstrates that equivalent adaptive mechanisms operate at the behavioral level in small-scale digital businesses.

Practically, these findings challenge the prevailing short-term orientation in MSME financial management by demonstrating that long-term financial orientation and anticipatory behavior are the primary drivers of resilience capacity. For investors and external stakeholders, static financial indicators alone are insufficient for evaluating business risk and long-term prospects; the quality of financial behavior and strategic orientation must also be considered as meaningful signals of resilience (Hillmann & Guenther, 2021; Liu et al., 2025).

Financial Sustainability as Both Structural Outcome and Enabling Condition

The significant effect of financial sustainability on financial resilience confirms that resilience is not spontaneously generated during a crisis but is progressively built through sustained financial management practices. Cash flow stability, cost efficiency, and financial flexibility serve as structural buffers that enable businesses to absorb shocks and maintain operational continuity under external pressure, findings consistent with prior research on organizational resilience and financial structure (Grego et al., 2024; Liu et al., 2025).

The more novel contribution of this finding, however, lies in the dual positioning of financial sustainability. The mediation result ($\beta = 0.275$; $p < 0.001$) confirms that financial sustainability operates as a transmission mechanism through which anticipatory financial behavior produces downstream resilience outcomes. Simultaneously, the moderation result ($\beta = 0.143$; $p = 0.007$) demonstrates that financial sustainability functions as an enabling boundary condition; businesses with stronger financial sustainability derive greater resilience benefits from the same level of forward-looking financial behavior. This dual-role conceptualization moves beyond treating financial sustainability as merely a financial outcome and reconceptualizes it as an active structural element within the capability-building process (Bagh et al., 2024; Supramono et al., 2025).

From a contingency perspective, this finding has important practical implications: strengthening financial sustainability is not only valuable in itself but amplifies the return on behavioral investment. Digital MSME owners who cultivate forward-looking financial habits will achieve substantially stronger resilience outcomes when those behaviors are supported by stable cash flows and efficient cost structures, rather than operating from a position of financial fragility.

Multiple Pathways to Financial Resilience

The simultaneous presence of direct (H3), mediated (H4), and moderated (H5) effects confirms that financial resilience in digital MSMEs is shaped through multiple, complementary pathways rather than a single mechanism. The direct effect of forward-looking financial behavior on financial resilience ($\beta = 0.373$; $p < 0.001$) establishes that behavioral orientation independently strengthens resilience capacity. Business actors who habitually anticipate risks and plan strategically are cognitively and operationally better prepared to respond to financial shocks, even absent perfect structural conditions (Supramono et al., 2025; Zeng & Rojniruttikul, 2025).

The indirect pathway through financial sustainability ($\beta = 0.275$; $p < 0.001$) adds a structural dimension to this relationship, demonstrating that anticipatory behavior also operates by progressively constructing the financial buffers and operational flexibility needed for resilience over time. The partial mediation result, where both direct and indirect effects remain significant, implies that neither behavioral nor structural mechanisms alone fully account for financial resilience; rather, they function as complementary and mutually reinforcing pathways (Grego et al., 2024; Hillmann & Guenther, 2021).

Theoretically, this multi-pathway structure reinforces the DCT proposition that strategic outcomes emerge from the integrated interaction of sensing, seizing, and reconfiguring processes (Teece, 2016; Teece et al., 1997). It further enriches the literature by providing empirical evidence that this capability architecture operates at the micro level of individual MSME financial decision-making in a developing economy context, a domain that has received comparatively limited attention in the dynamic capabilities literature.

Financial Sustainability as a Dual-Role Construct

The central conceptual contribution of this study is the empirical validation of financial sustainability as a construct with a dual role within a single integrated model. Existing literature has predominantly positioned financial sustainability either as a financial performance outcome or as an antecedent of organizational resilience (Liu et al., 2025; Tongtong et al., 2025). This study advances that framing by demonstrating simultaneously that financial sustainability mediates the behavioral-resilience relationship and moderates the strength of that relationship, roles that are theoretically distinct and empirically separable.

This dual-role conceptualization extends DCT into the microfinance domain by showing that the reconfiguring process serves not only as a mechanism through which behavioral capabilities produce outcomes, but also as a boundary condition that determines the magnitude of those outcomes. In doing so, this study provides a more comprehensive and nuanced theoretical account of how digital MSMEs build financial resilience, one that integrates behavioral, structural, and contingency perspectives into a unified explanatory framework (Hillmann & Guenther, 2021; Teece, 2016; Zeng & Rojniruttikul, 2025).

CONCLUSION

This study examines the role of forward-looking financial behavior in shaping financial resilience in digital businesses by placing financial sustainability as a key construct. The results of the study show that future-oriented financial behavior has a positive and significant effect on financial sustainability and financial resilience, both directly and indirectly. These findings confirm that financial resilience is not only determined by static

financial conditions, but also by the quality of orientation and financial decision-making processes that are anticipatory and long-term oriented.

Furthermore, this study found that financial sustainability has a dual role, namely as a partial mediator that explains the transmission path of the influence of forward-looking financial behavior on financial resilience, as well as as a moderator that strengthens the relationship. These findings suggest that good financial behavior will result in a more optimal impact on financial resilience when supported by sustainable financial conditions. Thus, financial resilience is formed through a combination of behavioral mechanisms and structural conditions that complement each other, especially in the context of dynamic and uncertain digital businesses.

Theoretically, this study extends the DCT into the domain of microfinance by showing that dynamic capability is also manifested in the behavior and orientation of individual financial decision-making. In addition, this research repositions financial sustainability from just financial outcomes to structural elements that play an active role in building financial resilience. In practical terms, these findings confirm the importance of strengthening long-term financial orientation, sustainable cash flow management, and adaptive financial decision-making as the main foundation for improving the resilience of digital businesses amid economic volatility.

LIMITATION

This study is subject to several methodological limitations that should be considered when interpreting the findings and their generalizability. First, the cross-sectional research design restricts the ability to establish causal directionality among the variables. Although the structural model demonstrates significant path coefficients consistent with the proposed causal framework, cross-sectional data capture respondents' perceptions at a single point in time and cannot confirm whether changes in forward-looking financial behavior precede or produce changes in financial sustainability and financial resilience over time. Future studies employing longitudinal designs would provide stronger grounds for causal inference and enable examination of how these relationships evolve across different stages of business development (Hair et al., 2022).

Second, all constructs in this study were measured through self-reported questionnaire items, which introduces the risk of common method bias. Respondents' assessments of their own financial behavior, financial sustainability, and financial resilience may be subject to social desirability bias or retrospective rationalization, potentially inflating the observed relationships among variables. Although the PLS-SEM measurement model confirmed adequate convergent and discriminant validity, future research would benefit from incorporating objective financial records or third-party assessments to complement self-reported data and strengthen the validity of construct measurement.

Third, the use of purposive sampling, while appropriate for ensuring respondent relevance to the research objectives, limits the statistical representativeness of the sample. The 180 respondents were selected based on predetermined eligibility criteria rather than probability-based procedures, which means the sample may not fully capture the diversity of digital MSME operators across Indonesia in terms of geographic distribution, industry sector, platform type, and business scale. Consequently, the findings should be interpreted as indicative rather than definitively representative of the broader digital MSME population.

Fourth, the scope of this study is limited to digital MSMEs operating within the Indonesian context, where specific institutional characteristics, including the structure of digital

platform ecosystems, the level of financial infrastructure development, and prevailing MSME support policies, may influence the strength and direction of the relationships identified.

The findings may not be directly transferable to digital MSMEs operating in other national contexts with different institutional environments, levels of financial market development, or digital economy maturity. Cross-national replication studies would be valuable in assessing the boundary conditions of the proposed theoretical model. Fifth, the moderation analysis in this study was conducted using a single composite interaction term between financial sustainability and forward-looking financial behavior. While this approach is consistent with standard PLS-SEM moderation procedures (Hair et al., 2022), it does not allow for the examination of non-linear moderation effects or threshold effects that may exist at different levels of financial sustainability. Future research employing multi-group analysis or polynomial regression approaches could provide more granular insight into the conditional nature of these relationships.

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DECLARATION OF CONFLICTING INTERESTS

The authors affirm that no competing interests are associated with this manuscript. This study was carried out autonomously and was not influenced by any commercial, financial, or personal affiliations that might be perceived as creating a conflict of interest. All contributing authors have reviewed and approved the final manuscript and consent to its submission and publication. The authors further state that the research was conducted in accordance with established ethical guidelines. Participation in the study was entirely voluntary, and informed consent was obtained from all respondents prior to data collection.

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