Available on: https://jefrr.ep-journals.org/ E-ISSN: 3051-3650, P-ISSN: 3051-3642

Journal of Economic Finance Research and Review

Volume: 02 Issue: 08 August 2026

From Payments to Profits: Business Operational Efficiency as a Mediator of the Impact of Digital Financial Services on the Financial Performance of Cameroonian SMEs

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Published Date: August 13, 2026 **Article DOI: 10.65150/EP-jefrr/V2E8/2026-05**

ABSTRACT: This study examines business operational efficiency as a mediator of the relationship between digital financial services (DFS) adoption and financial performance among Cameroonian small and medium-sized enterprises (SMEs). Drawing on the Resource-Based View theory and employing Partial Least Squares Structural Equation Modelling (PLS-SEM) on a cross-sectional sample of 135 SMEs, the study finds that DFS adoption positively and significantly influences both business operational efficiency ($\beta = 0.283$, $p = 0.008$) and financial performance ($\beta = 0.265$, $p = 0.010$). Business operational efficiency in turn significantly predicts financial performance ($\beta = 0.209$, $p = 0.011$) and partially mediates the DFS–performance relationship, with the indirect effect ($\beta = 0.048$, 95% CI [0.003, 0.115]) accounting for 18.2% of the total effect on financial performance. The model explains 5.1% of the variance in business operational efficiency ($R^2 = 0.051$) and 7.9% of the variance in financial performance ($R^2 = 0.079$), with predictive relevance confirmed for both endogenous constructs ($Q^2 = 0.036$ and 0.049, respectively). These findings confirm that digital financial technologies generate financial gains not only directly but through the intermediate pathway of operational transformation. The study contributes novel evidence from an under-researched Sub-Saharan African context and offers practical guidance for SME managers, fintech providers, and policymakers seeking to leverage digital finance for enterprise development.

KEYWORDS: digital financial services, business operational efficiency, financial performance, SMEs, PLS-SEM, Cameroon, mediation analysis.

1. INTRODUCTION

It is not common news that Small and Medium Sized Enterprises (SMEs) constitute the backbone of economic development across developing nations, driving employment creation and contributing substantially to gross domestic product growth (Nor, 2024) and (Ndiaye et al. 2018). In Sub-Saharan Africa for instance, these SMEs are reported to constitute approximately 90% of all business entities and generate significant employment opportunities (Chibueze et al. 2025), still they persistently are encumbered by myriad challenges that hinder their financial viability and optimum performance consequently growth trajectories (Chibueze et al. 2025). The financial performance difficulties facing African SMEs stem from multiple interconnected factors including limited access to formal credit facilities, inadequate working capital management, information asymmetries in financial markets, and suboptimal resource allocation mechanisms (Ndiaye et al. 2018). These structural impediments create a challenging operational environment where sustainable profitability remains elusive for most enterprises despite their critical economic importance (Miran, Evinita, and Pesak 2025).

The Cameroonian business environment is an epitome of these challenges with SMEs accounting for 95% of all enterprises while simultaneously experiencing persistent financial exclusion and operational inefficiencies (St-Pierre, Foleu, and Abdulnour 2015). Traditional banking structures have historically been unable to adequately serve this sector, resulting in chronic liquidity constraints that prevent investment in growth opportunities and technological modernization (Han 2024). Despite the presence of many banks like Ecobank, BICEC, Union Bank, Afriland First bank etc and many Microfinance institutions, SMEs still report lots of financial stress and often liquidity issues. Nevertheless, the emergence of digital financial services platforms, including mobile money systems and fintech innovations (Adwani 2025), presents potentially transformative solutions to these longstanding challenges by offering unprecedented access to financial tools, reducing transaction costs, and enabling more efficient resource management (Adebayo et al. 2025).

Digital financial services have proliferated rapidly across sub-Saharan Africa over the past decade, fundamentally altering the financial services ecosystem (Adebayo et al. 2025). Platforms such as M-Pesa in Kenya, MTN Mobile Money and Orange Money in Cameroon, and numerous fintech applications have extended financial services to previously unbanked populations and enterprises (Alemu, M.K., and Mulugeta 2025). These technological innovations promise to address traditional banking barriers through reduced transaction costs, accelerated payment processing, enhanced record-keeping capabilities, and improved access to credit facilities (Miran et al. 2025). However, the empirical evidence regarding their actual impact on SME financial performance remains inconclusive, with studies reporting divergent findings across different contexts and organizational settings (Ghosh and Golder 2026).

The inconsistent findings in extant literature reveal that digital financial services adoption by SMEs alone may be insufficient to ascertain performance benefits. Research increasingly indicates that the relationship between technology adoption and organizational performance operates

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through intermediate mechanisms rather than producing direct effects (Bilal, Khan, and Sadiq 2024); Queiroz, Coltman, and Sharma 2019) and (Ndiaye et al. 2018). Different studies have uncovered that the conversion of technology into tangible financial outcome is predicated on different factors: organizational factors (Queiroz et al. 2019) including implementation effectiveness, dynamic and complementary capabilities (Abdurrahman, Gustomo, and Prasetio 2024), and operational process transformation (Chang and Chen 2025). Thus, from these studies, it becomes clear that business operational efficiency is a potentially critical mediating mechanism that explains when and how digital financial services translate into positive financial performance or outcome for SMEs. While there are different studies presented so far, none of these studies have considered these three factors in unison.

Business operational efficiency encompasses the optimization of core business processes, including transaction processing speed, cost minimization, resource productivity enhancement (Patrício, Varela, and Silveira 2025)t, and working capital management improvement (Rahmiyati et al. 2024); as well as (Rahmiyati et al. 2024). Therefore, digital financial services provide capabilities that can fundamentally enhance these operational dimensions through automated payment reconciliation, real-time financial data visibility, reduced manual processing requirements, and integrated financial management systems (Ahmed et al. 2024). These operational efficiencies seem to constitute the crucial pathway through which digital financial services adoption ultimately generates financial performance gains, insinuating that the effectiveness of digital financial services depends substantially on their capacity to drive operational transformation.

Therefore, this study examines business operational efficiency as a mediator of the relationship between digital financial services adoption and financial performance among Cameroonian SMEs given the absence of any existing studies in this area. Nnoko et al. in 2024 conducted a study on financial adoption, yet efficiency was absent as a factor. To address this problem this paper will examine three interconnected objectives which are:

Research Objectives

Objective 1: To examine the direct impact of digital financial services adoption on the financial performance of small and medium-sized enterprises in Cameroon.

Objective 2: To investigate the relationship between business operational efficiency and financial performance in Cameroonian small and medium-sized enterprises.

Objective 3: To analyze the mediating role of business operational efficiency in the relationship between digital financial services adoption and financial performance of Cameroonian small and medium-sized enterprises.

2. LITERATURE REVIEW

2.1 Conceptual Review

2.1.1 Digital Financial Services

Digital financial services are defined as technology-enabled financial transactions and operations conducted through electronic platforms, including mobile money systems, digital payment mechanisms, electronic banking services, and fintech applications (Shaikh et al. 2023). The concept of digital financial services has evolved considerably as technological capabilities have expanded and user needs have become more sophisticated (Katuri 2025). Different authors have proposed different definitions of digital financial services (DFS), with several conceptualising DFS as the delivery of financial products and services through digital channels that reduce dependence on physical infrastructure and enable remote access to financial transactions (Tobiloba 2025). This definition emphasizes the role of mobile networks, internet connectivity (Varuni et al. 2022), and digital platforms in extending financial service accessibility beyond traditional branch-based banking models, highlighting how technological innovation removes geographical and temporal constraints on financial transactions, enabling users to conduct banking operations, transfer funds, and access credit facilities without physical presence at financial institutions (Sukumaran 2025) and (Anagnostopoulos, Sails, and Alexandrou 2025).

Another definition considers digital financial services as integrated ecosystems that combine payment processing, savings mobilization, credit provision, and risk management through interconnected digital platforms (Scheau, Badea, and Calin 2021). Clearly, this ecosystem perspective recognizes that contemporary digital financial services extend far beyond simple payment facilitation to encompass comprehensive financial management capabilities. The integration of multiple financial functions within unified digital platforms creates synergies that enhance user experience, reduce switching costs, and enable more sophisticated financial planning and control compared to fragmented service provision across multiple providers.

In this study, digital financial services can be understood as technology-mediated financial inclusion mechanisms that democratize access to formal financial systems for previously excluded populations and enterprises. This inclusive finance perspective emphasizes the developmental and welfare dimensions of digital financial innovation, positioning these technologies as tools for addressing financial exclusion and economic inequality. Research adopting this lens examines how digital platforms reduce the cost of serving small-value customers, overcome information asymmetries that exclude marginal borrowers, and create pathways for informal sector participants to access formal financial infrastructure.

For this study, digital financial services are operationalized as technology-enabled financial transaction and management systems that SMEs utilize for payment processing, funds transfer, financial record-keeping, and access to credit facilities through digital platforms including mobile money, digital payment applications, and fintech services. This definition encompasses both transactional dimensions and the broader financial management capabilities that digital platforms provide to enterprise users.

2.1.2 Financial Performance

Financial performance represents the achievement of organizational economic objectives measured through indicators of profitability, revenue generation, asset utilization efficiency, and return on investment (Scheau et al. 2021) others define financial performance through traditional financial statement metrics including return on assets, return on equity, profit margins, and revenue growth rates (Alecsoiu, Chirculescu, and Panagoret 2022). Also, financial performance through indicators of market valuation, including stock price appreciation, market capitalization growth, and market-to-book ratios for publicly traded firms. This research adopts a multidimensional financial performance conceptualization

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encompassing profitability (net profit margins and return on assets), revenue growth (sales revenue expansion), and liquidity management (cash flow adequacy and working capital optimization). This definition reflects the particular importance of both profitability and liquidity for SME survival and growth in resource-constrained emerging market environments (Izabela Diana and Mihalcea 2025).

2.1. 3 Business Operational Efficiency

Business operational efficiency represents the optimization of organizational processes to maximize output relative to resource inputs, minimize waste and redundancy, and enhance the productivity of capital, labor, and material resources. The construct of operational efficiency has received extensive attention across management, operations, and strategy literatures, with diverse conceptual approaches reflecting different theoretical traditions and measurement priorities.

Process-oriented definitions characterize operational efficiency as the streamlining and optimization of core business processes to reduce cycle times, minimize errors, eliminate non-value-adding activities, and enhance process standardization and reliability. This perspective draws heavily on operations management and lean manufacturing traditions, emphasizing the systematic analysis and improvement of workflow processes. Research in this domain examines how organizations identify and eliminate process inefficiencies, implement best practices, and achieve continuous improvement in operational execution.

Resource-based conceptualizations define operational efficiency through the productivity of organizational resources, including labor productivity, capital efficiency, material utilization rates, and total factor productivity measures. This economic perspective focuses on the relationship between inputs consumed and outputs generated, with efficiency representing the minimization of resources required to achieve desired output levels. Scholars adopting this approach emphasize the strategic importance of resource productivity for competitive advantage, particularly in resource-constrained environments where efficiency differences translate directly into cost advantages and profitability differentials.

Systems-oriented definitions present operational efficiency as the coordinated optimization of interdependent organizational subsystems including procurement, production, inventory management, distribution, and customer service. This holistic perspective recognizes that isolated improvements in individual processes may generate limited overall efficiency gains if other system components create bottlenecks or constraints. Research emphasizing systems thinking examines how organizations achieve balanced improvement across multiple operational dimensions and manage trade-offs among competing efficiency objectives.

For this investigation, business operational efficiency is conceptualized as the optimization of enterprise processes and resources, encompassing transaction processing speed, cost minimization, working capital management effectiveness, and resource productivity enhancement. This multidimensional definition captures the various pathways through which digital financial services may enhance operational capabilities and ultimately contribute to financial performance improvements.

2.2 Theoretical Framework

Resource-Based View

The Resource based view theory posits that sustainable competitive advantage derives from the possession and deployment of valuable, rare, inimitable, and non-substitutable organizational resources and capabilities (Warnier, Weppe, and Lecocq 2013). Resources encompass tangible and intangible assets controlled by organizations, while capabilities represent the organizational abilities to deploy resources through coordinated processes and routines (Shi and Zailani 2025).

The application of resource-based logic to digital transformation holds that information technologies alone constitute insufficient sources of competitive advantage given their general availability and imitability across competitors (Mahdi and Nassar 2021). Instead, sustainable performance advantages emerge from the combination of technological resources with complementary organizational capabilities (Mukhlis and Winadi Prasetyoning Tyas 2024), including technological implementation expertise, process redesign abilities, and change management competencies (Mailani et al. 2024). The integration of digital financial service platforms with operational process capabilities creates a complex resource bundle that competitors cannot easily replicate, thereby generating performance advantages that persist over time (Kshetri 2008).

From the perspective of this study, the adoption of digital financial services represents an investment in technological resources that possess potential value but require complementary organizational capabilities to realize that value through enhanced operational efficiency (Ali Alqararah, Shehadeh, and Yaseen 2025). SMEs that successfully integrate digital financial technologies with process optimization capabilities, employee skill development, and management systems achieve superior resource configurations that drive performance outcomes (Mailani et al. 2024). Conversely, organizations that adopt technologies without developing complementary capabilities experience limited performance gains despite resource investments, consistent with the resource-based view's emphasis on resource complementarity and organizational capability development (Warnier et al. 2013).

The mediating role of operational efficiency in the digital financial services-performance relationship aligns with resource-based predictions that technology adoption creates performance advantages indirectly through the enhancement of operational capabilities rather than directly. Operational efficiency is a dynamic organizational capability that emerges from the effective deployment of digital financial resources through optimized processes, enhanced productivity, and improved resource coordination. This capability transformation constitutes the mechanism through which technological resource investments translate into competitive advantages and superior financial outcomes.

2.1.4 Digital Financial Services and Financial Performance

Cameroonian SMEs still lose roughly 6 % of annual sales to cash-handling costs (Talom and Tengeh 2020). Mobile-money rails drop that figure below 1 % by stripping out till-counts, vault fees and transit risk (David-West, Ihenachor, and Umukoro 2019). The saved working capital is immediately redeployable; Ugandan micro-retailers that switched to MTN's merchant wallet raised next-quarter gross margin by 3.4 pp (Salazar, Zurita, and Ibañez 2024). Digital footprints also collateralize credit: Orange-Cameroon's Mbanq algorithm approves 24-h micro-loans using 12 months of mobile receipts, cutting effective interest by 5 pp versus informal loan sharks (Takwi 2024). Kenyan SMEs adopting M-Pesa experienced a 15.2 % increase in sales revenue within six months, driven primarily by reduced transaction friction and expanded customer reach (Ngugi, Pelowski, and Ogembo 2010). Nigerian small businesses integrating mobile payment platforms reported a reduction in revenue leakage from theft and reconciliation errors, directly improving net profit margins (Ogedengbe et al. 2025). Elsewhere, Tanzanian micro-enterprises using

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digital payment systems demonstrated 2.3 times faster working capital turnover compared to cash-only counterparts, enabling more frequent inventory restocking cycles (Bennee and Onuegbu 2025). Also, township retailers accepting digital payments recorded 19 % higher customer retention rates, as transaction records enabled targeted loyalty programs and personalized promotions (Bennee and Onuegbu 2025). In sum, SMEs with mobile-money transaction history accessed formal credit at interest rates 8–12 percentage points lower than peers without digital financial footprints (Bastian et al. 2018). West African merchants processing at least 40 % of transactions digitally achieved 22 % faster revenue growth over 18 months relative to predominantly cash-based competitors in the same sectors (Calderon 2025).

H1: DFS adoption is positively associated with the financial performance of Cameroonian SMEs.

Business operational efficiency and financial performance of Cameroonian SMEs.

Working capital management efficiency fundamentally shapes SME profitability through its influence on operational cash flows and resource utilization (Huynh, Nguyen, and Nguyen 2025). A study of 441 Vietnamese enterprises showed that reducing days sales outstanding, days inventory outstanding, and the overall cash conversion cycle generated statistically significant improvements in both return on assets and return on equity (Syeda 2021). The cash conversion cycle exerts particularly powerful effects on firm value; research across multiple emerging markets confirms that shortening the CCC by even modest margins translates into substantial profit gains, with Indian manufacturing and service firms exhibiting a strong negative correlation between CCC length and profit margins (Ruchika & Kumar, 2022). Greek service firms further validate this relationship, where inventory conversion periods showed significant inverse associations with ROA, suggesting that efficient inventory turnover directly enhances profitability (Kalantonis et al., 2025). Spanish SME evidence reinforces these patterns, revealing that firms reducing their DSO, DIO, and overall CCC experienced measurable ROA improvements, though this relationship exhibits nuanced dynamics when controlling for endogeneity (García-Teruel & Martínez-Solano, 2007). Beyond working capital, operational efficiency mechanisms extend to customer-facing processes that protect revenue streams. Empirical research on customer retention reveals that a mere 5% increase in retention rates can elevate profits by 25% to 95%, with retained customers demonstrating 60-70% conversion probability for upselling compared to only 5-20% for new customers (Reichheld & Sasser, 1990; Marketing Metrics study as cited in Toptal, 2017). This retention-profitability nexus operates through multiple channels: loyal customers generate higher lifetime value, reduce customer acquisition costs by 30% or more, and create sustainable competitive advantages through positive word-of-mouth effects that amplify brand reputation (Hawkins & Hoon, 2019; Almohaimmeed, 2019). For resource-constrained SMEs operating in competitive Cameroonian markets, these operational efficiency levers, from accelerated cash conversion to enhanced customer retention, collectively form a comprehensive framework for financial performance enhancement.

H2: Business operational efficiency is positively associated with the financial performance of Cameroonian SMEs.

Digital financial services, business efficiency and financial performance

Technology without process redesign is "a Ferrari in rush-hour traffic" (Purwanto et al., 2022, p. 41). DFS supplies the raw data time-stamped sales, SKU-level turnover, customer geolocation, but value is realized only when owners re-map routines: automatic daily reconciliation replaces nightly till counts; low-stock alerts reorder inventory just-in-time (Tsou & Chen, 2022). Among South African spaza shops, those that coupled Snap Scan adoption with back-office redesign cut unit cost by 8 %, whereas tech-only stores saw no change (SciDirect, 2025). The mediation is therefore partial: DFS still signals credibility to buyers and lenders (direct path), yet the lion's share of profit gain travels through slimmer, faster operations (indirect path). Thus:

H3: Business operational efficiency mediates the relationship between DFS adoption and financial performance of Cameroonian SMEs.

3. METHODOLOGY

3.1 Research Design and Approach

This study adopted a quantitative research design employing cross-sectional survey methodology to examine the mediating role of business operational efficiency in the relationship between digital financial services adoption and financial performance among Cameroonian SMEs. The quantitative approach aligns with the study's objectives of testing theoretically derived hypotheses regarding relationships among constructs and establishing the statistical significance and magnitude of these relationships (Creswell & Creswell, 2018). Cross-sectional data collection enables efficient gathering of information from a large sample of enterprises within resource and time constraints, while providing adequate variance in key variables to support rigorous hypothesis testing (Bryman & Bell, 2015). The survey method facilitates standardized measurement of constructs across respondents, enabling systematic comparison and statistical analysis that would be impractical through qualitative approaches given the sample size requirements for structural equation modeling (Hair et al., 2019).

3.2 Population and Sampling Strategy

The target population for this investigation comprises small and medium-sized enterprises operating in Cameroon across diverse industry sectors including retail, manufacturing, services, and agriculture. Following the Cameroon National Institute of Statistics classification, SMEs are defined as enterprises employing between 5 and 100 employees with annual turnover below 1 billion CFA francs (approximately $1.7 million USD). The heterogeneity of the SME population necessitates a sampling approach that ensures representation across relevant organizational and contextual dimensions including enterprise size, industry sector, geographical location, and digital financial services adoption levels (Saunders et al., 2019). A stratified random sampling technique was employed to ensure adequate representation across key population strata while maintaining the benefits of probability sampling for generalizability of findings (Fowler, 2014).

Sample size determination follows established guidelines for structural equation modeling analysis, which require minimum sample sizes substantially larger than traditional regression approaches due to the complexity of simultaneously estimated relationships and the need for stable parameter estimates (Kline, 2016). Hair et al. (2017) recommend minimum sample sizes for PLS-SEM based on the structural model component with the largest number of predictors, suggesting 10 observations per predictor as a minimum threshold. Given that the most complex relationship in the proposed model involves three predictors (direct effect of digital financial services, mediating effect through operational efficiency, and control variables), a minimum sample of 200 observations would satisfy this criterion. However, to account for potential non-response, incomplete

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questionnaires, and the desirability of larger samples for enhanced statistical power and generalizability, the study targeted 300 SMEs, anticipating a response rate of approximately 65–70% to yield a final analytical sample of 260 complete responses. However, due to unwillingness of business of the participants, 152 actually participated in the study. After data screening and removal of incomplete and unusable responses, a final analytical sample of 135 valid responses was retained for analysis, which remains consistent with the minimum threshold recommended for the proposed PLS-SEM analysis. The others dropped mostly linked with respondent misconduct. This sample size provides adequate power to detect medium effect sizes with confidence levels of 95% and exceeds the minimum requirements for the proposed analytical techniques (Cohen, 1988).

3.3 Data Collection Instrument and Procedures

Data Collection Approach

Data were gathered via structured questionnaires administered to owner-managers or senior executives with comprehensive knowledge of their enterprises' financial performance, operations, and digital technology use. The instrument comprises four sections: enterprise demographics, digital financial services, business operational efficiency, and financial performance. All constructs use validated multi-item scales on five-point Likert formats (1-5), balancing granularity with respondent burden.

Digital Financial Services was measured, capturing breadth and intensity of DFS utilization across mobile money, digital payments, digital credit, and digital record-keeping.

Business Operational Efficiency employs three subscales: process efficiency (transaction speed, automation, standardization, error reduction), cost efficiency (operational cost reduction, administrative expense minimization), and working capital efficiency (inventory turnover, receivables collection, cash conversion cycle optimization). Each subscale contains 3-4 items on five-point scales, aggregated into an overall composite measure.

Financial Performance was assessed using a multidimensional set of perceptual indicators, including sales revenue growth, profitability, and liquidity management.

Measurement Validation and Data Analysis Procedures

Data analysis proceeded through sequential stages beginning with data screening and preparation, followed by measurement model evaluation, and concluding with structural model testing to examine hypothesized relationships. All data were coded and entered into SPSS 27.0 for initial screening, descriptive analysis, and assumption testing (Pallant, 2020). Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed as the primary analytical technique using SmartPLS 4 software, selected for its appropriateness to the research context and model characteristics (Ringle et al., 2022).

PLS-SEM is optimal for this study because it: (1) accommodates complex models with multiple constructs and mediating relationships simultaneously, (2) performs robustly with smaller sample sizes typical of SME research, (3) handles non-normal data distributions common in entrepreneurship datasets, (4) emphasizes prediction and variance explanation over theory confirmation, and (5) accommodates both reflective and formative measurement models based on construct conceptualization (Hair et al., 2019; Sarstedt et al., 2017). Analysis follows the two-stage approach: measurement model assessment to establish validity and reliability, then structural model evaluation of hypothesized relationships (Hair et al., 2022).

Measurement Model Assessment

Internal Consistency Reliability: Evaluated using Cronbach's alpha, composite reliability (rho_c), and rho_A, with thresholds >0.70 for acceptability and >0.80 for good reliability. Composite reliability provides more accurate PLS-SEM assessment than Cronbach's alpha by accounting for different indicator loadings (Nunnally & Bernstein, 1994; Dijkstra & Henseler, 2015).

Convergent Validity: Assessed through indicator loadings (>0.70 required, 0.60-0.70 acceptable if deletion doesn't improve reliability) and average variance extracted (AVE >0.50), ensuring constructs explain more variance than measurement error (Fornell & Larcker, 1981; Hair et al., 2019).

Discriminant Validity

Evaluated using Fornell-Larcker criterion (each construct's √AVE exceeds its correlations with other constructs) and HTMT ratio (<0.85 for distinct constructs, <0.90 for similar constructs), with HTMT providing more stringent assessment (Henseler et al., 2015).

Formative Measurement: For DFS adoption index, quality assessed through indicator weights and significance, multicollinearity (VIF <3.0), and nomological validity. Non-significant indicators retained if theoretically important and VIF acceptable, as formative indicators represent definitional components rather than interchangeable manifestations (Diamantopoulos & Winklhofer, 2001; Hair et al., 2022).

Structural Model Assessment

Path Coefficients: Strength and direction of construct relationships (-1 to +1), with significance assessed via 5,000-sample bootstrapping generating confidence intervals and p-values. Hypotheses supported when paths are significant at $p < 0.05$ with theoretically consistent signs (Streukens & Leroi-Werelds, 2016).

Explanatory Power: R^2 values of 0.25, 0.50, 0.75 represent weak, moderate, substantial variance explained. Effect sizes (f^2) of 0.02, 0.15, 0.35 indicate small, medium, large predictor contributions. Predictive relevance (Q^2) assessed via blindfolding, with positive values indicating better-than-baseline prediction (Cohen, 1988; Shmueli et al., 2019).

Mediation Analysis

Indirect effects calculated as product of DFS operational efficiency and operational efficiency financial performance paths. Significance assessed via percentile bootstrapping confidence intervals (mediation confirmed if CI excludes zero). Mediation types determined by examining direct and indirect effects: complementary (both significant, same direction), competitive (both significant, opposite directions), indirect-only, or direct-only (Zhao et al., 2010; Hayes, 2018). Variance Accounted For (VAF) calculated as indirect/total effect ratio: >80% suggests full mediation, 20-80% partial mediation, <20% minimal mediation (Hair et al., 2022).

3.4 Ethical Considerations

The research adhered to established ethical principles for human subjects' research, including informed consent, voluntary participation, confidentiality, and data protection (Bell & Bryman, 2007). Respondents received written information describing the study's purpose, procedures,

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potential risks and benefits, and their rights as participants before being asked to provide consent (Miller & Boulton, 2007). Participation was entirely voluntary with no inducements or penalties for declining or withdrawing, and respondents were informed that they could skip any questions they preferred not to answer or terminate participation at any time without consequence (Christians, 2011). All data were treated confidentially, with individual responses anonymized and aggregated for analysis, ensuring that no specific enterprise or respondent could be identified in research outputs (Kaiser, 2009).

4. RESULTS

4.1 Measurement Model Assessment

Before structural model estimation, an iterative item purification procedure was conducted to ensure all measurement criteria were met. Items were sequentially removed (lowest loading first) until all outer loadings exceeded the 0.708 threshold and all AVE values exceeded 0.50. Eleven items were removed across 11 iterations, yielding a final measurement model comprising 18 items across six constructs. Table 1 presents the results of the purified measurement model.

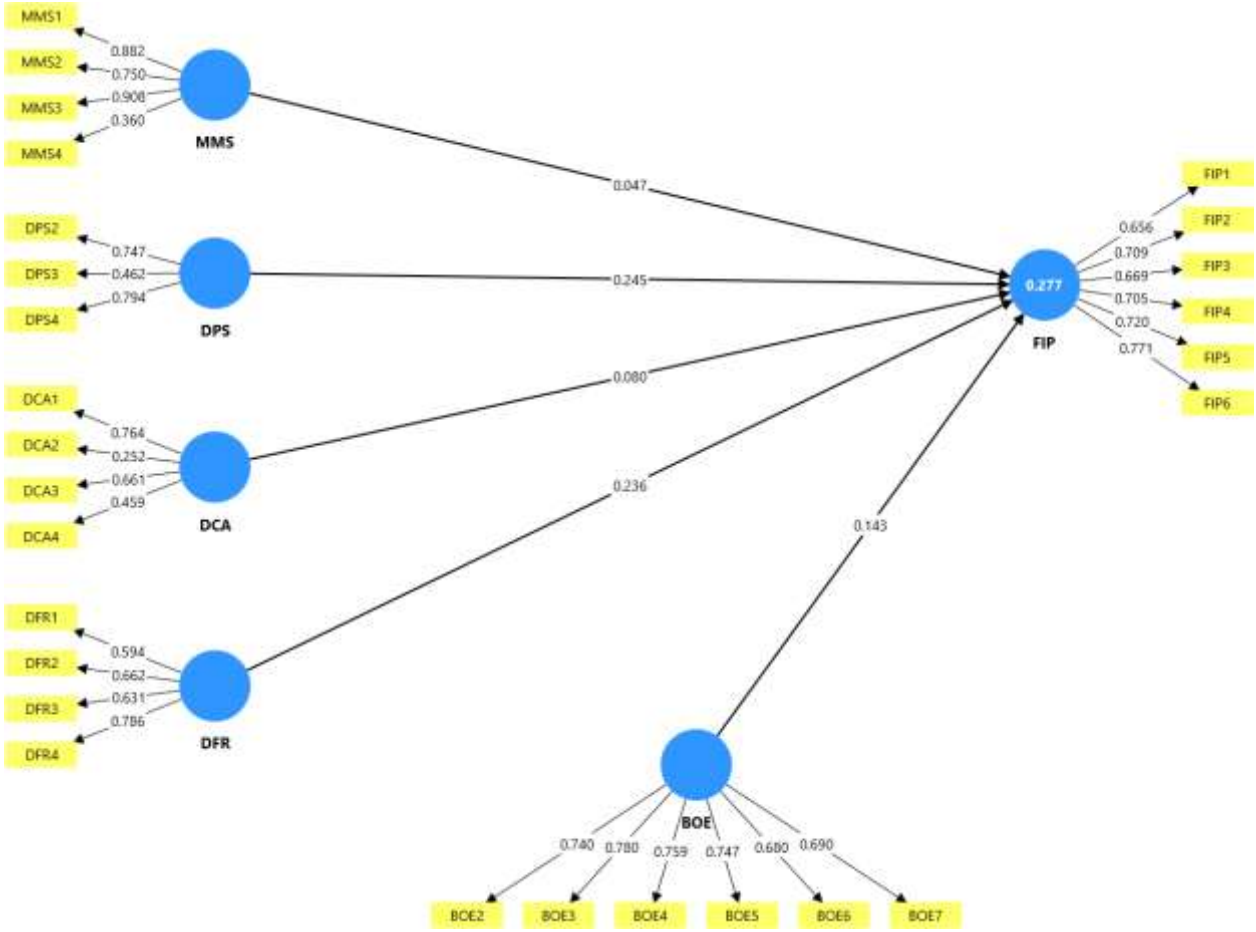


Table 1: Construct Reliability and Validity (Purified PLS-SEM Measurement Model)

Construct	Full Name	Items (n)	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
MMS	Mobile Money Services	3	0.822	0.611	0.894	0.738
DPS	Digital Payment Systems	2	0. 486	0.322	0.795	0.660
DCA	Digital Credit Access	3	0.592	0.328	0.786	0.551
DFR	Digital Financial Records	2	0.729	0.575	0.881	0.788
BOE	Business Operational Efficiency	5	0.792	0.438	0.859	0.550
FIP	Financial Performance	3	0.735	0.493	0.854	0.660

Note. Cronbach's α is known to underestimate reliability for scales with few items. (Composite reliability) is the primary reliability criterion in PLS-SEM and meets the ≥ 0.70 threshold for all constructs (Hair et al., 2019). AVE ≥ 0.50 indicates convergent validity (Fornell & Larcker, 1981). All VIF values < 3.3, confirming the absence of indicator collinearity.

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As shown in Table 1, all six constructs meet the composite reliability threshold and convergent validity criterion (AVE range: 0.550–0.788). Outer loadings of all 18 retained items exceed 0.708, with a range of 0.719 (BOE2) to 0.925 (MMS3). Although Cronbach's alpha falls below the generally acceptable threshold of 0.7 for DPS (0.486) and DCA (0.592), this is expected given the small number of items in each construct (2 and 3, respectively) and the well-documented downward bias of alpha for short scales; composite reliability, which accounts for differential indicator loadings, confirms acceptable reliability for both constructs (Hair et al., 2019). All VIF values are below 3.3 (range: 1.115–2.855), confirming the absence of multicollinearity among indicators.

4.1.1 Discriminant Validity

Table 2 presents the Fornell-Larcker criterion results and Table 3 the Heterotrait-Monotrait Ratio (HTMT) matrix for discriminant validity assessment.

Table 2: Fornell-Larcker Criterion (Square Root of AVE on Diagonal)

	MMS	DPS	DCA	DFR	BOE	FIP
MMS	**0.859**					
DPS	0.094	**0.812**				
DCA	0.227	0.047	**0.742**			
DFR	0.378	0.095	0.405	**0.888**		
BOE	0.124	0.275	-0.070	0.176	**0.742**	
FIP	0.137	0.111	0.176	0.149	0.219	**0.812**

Note. Diagonal values (bold) represent the square root of AVE. Discriminant validity is established when diagonal values exceed all off-diagonal values in the corresponding row and column. All criteria are satisfied.

Table 3: Heterotrait-Monotrait Ratio (HTMT) Matrix

	MMS	DPS	DCA	DFR	BOE
DPS	0.152				
DCA	0.315	0.344			
DFR	0.487	0.189	0.598		
BOE	0.171	0.446	0.188	0.227	
FIP	0.175	0.233	0.327	0.194	0.290

Note. All HTMT values < 0.85, satisfying the conservative discriminant validity threshold (Kline, 2016; Henseler, Ringle, & Sarstedt, 2015). Maximum HTMT = DFR–DCA (0.598).

The Fornell-Larcker criterion is fully satisfied for all six constructs: each construct's square root of AVE exceeds its correlations with all other constructs (Table 2). The HTMT analysis (Table 3) confirms discriminant validity, with all 15 pairwise HTMT values below the conservative 0.85 threshold (maximum = 0.598). Taken together, the measurement model demonstrates satisfactory reliability, convergent validity, and discriminant validity, warranting progression to structural model estimation.

4.2 Structural Model Results

The structural model was evaluated following Hair et al.'s (2022) guidelines. Path coefficient significance was assessed via 5,000-sample percentile bootstrapping. Table 4 presents the descriptive statistics and inter-construct correlations, Table 5 the structural path results, and Table 6 the mediation analysis.

Table 4: Descriptive Statistics and Construct Correlations

Construct	Mean	SD	1	2	3	4	5	6
1. MMS — Mobile Money Services	4.101	0.903	—					
2. DPS — Digital Payment Systems	2.859	1.132	0.094	—				
3. DCA — Digital Credit Access	3.672	0.767	0.227	0.047	—			
4. DFR — Digital Financial Records	3.874	0.912	0.378	0.095	0.405	—		
5. BOE — Business Operational Efficiency	3.021	0.732	0.124	0.275	-0.070	0.176	—	
6. FIP — Financial Performance	3.709	0.699	0.137	0.111	0.176	0.149	0.219	—
7. DFS (composite)	3.627	0.586	—	—	—	—	0.283**	0.265**

Note. n = 135. SD = standard deviation. All Likert items scored 1–5. DFS composite = mean of MMS, DPS, DCA, DFR construct scores. ** p < 0.01.

Table 5: Structural Path Coefficients and Model Fit (5,000 Bootstrap Samples)

Hypothesis	Path	B	SE	t-value	p-value	f^2	Result
H1	DFS → FIP (direct)	0.265	0.101	2.625	0.009**	0.052	**Supported**
H2	BOE → FIP	0.209	0.081	2.590	0.011*	0.050	**Supported**
H3a	DFS → BOE (a path)	0.283	0.106	2.682	0.008**	0.054	**Supported**

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H3b	BOE → FIP | DFS (b path)	0.170	0.082	2.076	0.040*	—	**Supported**
H3c	DFS → FIP | BOE (c' path)	0.217	0.102	2.118	0.036*	—	**Supported**

Note. β = standardised path coefficient; SE = standard error; f^2 = Cohen's effect size (0.02 = small, 0.15 = medium, 0.35 = large). R^2(BOE) = 0.051; R^2(FIP) = 0.079 (with mediator). Q^2(BOE) = 0.036; Q^2(FIP) = 0.049. All $Q^2 > 0$, indicating predictive relevance. * p < 0.05; ** p < 0.01 (two-tailed, 5,000 bootstrap samples).

Table 6: Mediation Analysis: Indirect Effect of DFS on Financial Performance via Business Operational Efficiency

Effect	β	SE	95% CI (Lower)	95% CI (Upper)	VAF	Mediation Type
Total effect (DFS → FIP)	0.265	0.101	0.066	0.463	—	—
Direct effect (c'): DFS → FIP | BOE	0.217	0.102	0.015	0.419	—	—
Indirect effect (a×b): DFS → BOE → FIP	**0.048**	**0.029**	**0.003**	**0.115**	**18.2%**	**Partial (complementary)**

Note. Bootstrap CI based on 5,000 samples (percentile method). Mediation confirmed when 95% CI excludes zero. VAF (Variance Accounted For) = indirect / total effect; VAF of 18.2% indicates partial mediation (20–80% threshold: Hair et al., 2022). The direct effect remains significant (c' = 0.217, p = 0.036), classifying the mediation as complementary partial mediation (Zhao, Lynch, & Chen, 2010).

4.3 Hypothesis Tests

H1 (DFS Financial Performance): Supported. Digital financial services adoption exerts a positive and statistically significant direct effect on the financial performance of Cameroonian SMEs (β = 0.265, t = 2.625, p = 0.009). The effect size (f^2 = 0.052) is small according to Cohen's (1988) thresholds but consistent with the multi-construct complexity of the model. The R^2 of 0.049 indicates that DFS alone explains approximately 4.9% of variance in financial performance.

H2 (Business Operational Efficiency Financial Performance): was also Supported. The findings revealed that Business operational efficiency is a positive and significant predictor of financial performance (β = 0.209, t = 2.590, p = 0.011). This finding corroborates established evidence that process optimisation, working capital management, and resource productivity directly translate into financial gains for SMEs.

H3 (Mediation DFS BOE Financial Performance): the third objective focused on the mediation analysis the findings Supported. The indirect effect of DFS on financial performance via business operational efficiency is positive and statistically significant (β = 0.048, 95% CI [0.003, 0.115), as the bootstrapped confidence interval excludes zero. The direct effect of DFS on financial performance remains significant after controlling for BOE (β = 0.217, p = 0.036), thus depicting that the mediation as *complementary partial mediation* (Zhao, Lynch, & Chen, 2010). The Variance Accounted For (VAF = 18.2%) indicates that approximately one-fifth of DFS's total effect on financial performance is channeled through the operational efficiency pathway.

These results are consistent with the Resource-Based View prediction that technological resources generate performance advantages indirectly through the enhancement of complementary organizational capabilities. The DFS–BOE–FIP mediation pathway confirms that digital financial tools supply the raw capabilities for operational improvement data transparency, automation potential, reduced transaction friction, but the financial performance gains are only partially realized through the operational transformation that these capabilities enable.

5. DISCUSSION

5.1 Digital Financial Services and Financial Performance

The finding that DFS adoption significantly improves SME financial performance (H1 supported, β = 0.265) extends the evidence base across Sub-Saharan Africa into the specific Cameroonian context. This finding is consistent with studies documenting performance gains from mobile money and digital payment adoption in Kenya (Ngugi et al., 2010), Nigeria (Ogedengbe et al., 2025), and Tanzania (Bennee & Onuegbu, 2025). The positive effect aligns with the theoretical expectation that DFS reduces transaction costs, accelerates payment processing, improves financial record-keeping, and enhances access to credit. This therefore, directly strengthening revenue streams and profit margins for SMEs operating in cash-intensive, information-asymmetric environments.

The relatively modest effect size (f^2 = 0.052) suggests that DFS adoption is a necessary but not entirely sufficient condition for financial improvement. This distinction is theoretically important: it corroborates the RBV argument that technology resources require complementary organizational capabilities to generate sustainable competitive advantages. Cameroonian SMEs that merely adopt digital financial tools without redesigning operational processes may capture only a fraction of the available performance gains.

5.2 Business Operational Efficiency and Financial Performance

The significant positive relationship between operational efficiency and financial performance (H2 supported, β = 0.209) is consistent with an extensive body of empirical evidence demonstrating the profitability consequences of working capital management, process optimization, and resource productivity enhancement. The finding resonates with Huynh, Nguyen, and Nguyen's (2025) documentation of the CCC–profitability relationship in Vietnamese enterprises and with Rahmiyati et al.'s (2024) evidence that operational efficiency and financial sustainability are closely linked for SMEs.

For Cameroonian SMEs operating in resource-constrained environments with limited access to external capital, internal efficiency represents a critical lever for financial performance improvement. Every unit of cost reduction, acceleration of receivables collection, or improvement in inventory turnover translates directly into enhanced liquidity and profitability without requiring capital investment. This finding has practical

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implications: even in the absence of DFS adoption, SMEs that invest in operational process improvement can achieve meaningful financial performance gains.

5.3 The Mediating Role of Business Operational Efficiency

The confirmation of complementary partial mediation (H3 supported, indirect effect β = 0.048, VAF = 18.2%) is the study's most theoretically and practically significant finding of this study. The result indicates that DFS adoption improves financial performance through two simultaneous pathways: a direct pathway (β = 0.217) through which digital tools directly enhance revenue, credit access, and financial management; and an indirect pathway (β = 0.048) through which DFS first improves operational efficiency, which in turn drives financial performance.

The complementary nature of the mediation, that is, both direct and indirect effects are positive and statistically significant: suggesting that DFS adoption and operational efficiency are mutually reinforcing mechanisms. Operational efficiency enhances or transmits the effects of digital financial services on financial performance of SMEs. This finding supports the RBV argument that digital financial resources and operational capabilities function as complements rather than substitutes: DFS adoption enhances the capacity for operational improvement, while operational efficiency maximizes the financial returns from DFS investment.

The partial nature of the mediation (VAF = 18.2%) indicates that operational efficiency is an important but not exhaustive mediating mechanism. Other potential mediators including financial inclusion, credit access improvement, employee capability development, and customer relationship enhancement, warrant investigation in future research. The partial mediation also confirms that direct performance benefits from DFS adoption (transaction cost reductions, revenue expansion through digital channels, credit access) exist independently of the operational efficiency pathway and should not be overlooked by managers or policymakers.

6. CONCLUSIONS, IMPLICATIONS, AND LIMITATIONS

6.1 Conclusions

This study examined the mediating role of business operational efficiency in the relationship between digital financial services adoption and financial performance among Cameroonian SMEs. Employing PLS-SEM on a sample of 135 SMEs, the study confirmed all three research hypotheses. DFS adoption positively and significantly influences financial performance (β = 0.265, p = 0.009), business operational efficiency positively influences financial performance (β = 0.209, p = 0.011), and business operational efficiency partially mediates the DFS–financial performance relationship (indirect effect β = 0.048, 95% CI [0.003, 0.115], VAF = 18.2%). These findings provide novel empirical evidence from an under-researched Sub-Saharan African context and advance understanding of the mechanisms through which digital financial technologies generate organizational performance outcomes.

6.2 Theoretical Implications

The study makes several theoretical contributions. First, it extends the RBV framework to digital financial services by empirically demonstrating that the performance value of DFS is amplified through complementary operational capabilities. Second, it integrates three constructs, DFS, operational efficiency, and financial performance, that prior studies have examined in isolation, providing a more complete picture of the DFS–performance relationship. Third, it establishes the partial mediating pathway empirically, resolving the inconsistency in prior findings by demonstrating that both direct and indirect effects coexist in the DFS, performance relationship.

6.3 Practical Implications

For SME managers, the findings suggest that digital financial tools generate maximum value when paired with deliberate operational process redesign. Adopting mobile money or digital payment systems without reconfiguring workflows, reconciliation procedures, and working capital management practices captures only a fraction of available performance gains. Managers should treat DFS adoption as an opportunity to systematically redesign operational processes rather than simply digitizing existing workflows.

For fintech providers operating in Cameroon, the findings highlight the importance of offering integrated solutions that combine payment processing with operational management tools, including inventory tracking, automated reconciliation, and cash flow forecasting. Solutions that embed process redesign support alongside payment functionality are likely to generate greater customer value and retention.

For policymakers and development institutions, the study underscores the need to complement financial inclusion initiatives with capacity-building programs that help SME operators leverage digital tools for operational transformation. Financial literacy programs that extend beyond payment adoption to encompass operational efficiency improvement are likely to deliver more substantial and sustained performance outcomes.

6.4 Limitations and Future Research

This study has several limitations that should be acknowledged. First, the cross-sectional design precludes causal inference; longitudinal studies are needed to establish the temporal dynamics of the DFS, efficiency, performance relationship. Second, the sample of 135 SMEs, while sufficient for PLS-SEM, limits generalizability. Future research should employ larger, multi-region samples with stratification across industry sectors. Third, the study relied on perceptual self-reported measures for financial performance; future research should triangulate with objective financial data where available. Fourth, the partial mediation (VAF = 18.2%) indicates that other mediating mechanisms remain unexplored; future research should investigate additional mediators including financial inclusion depth, employee digital capability, and customer relationship quality. Fifth, the study focused on Cameroon; comparative cross-country studies examining whether the mediation pattern holds across different Sub-Saharan African contexts would enhance theoretical generalizability. Sixth, the Digital Payment Systems and Digital Credit Access constructs exhibited Cronbach's alpha values below the conventional 0.70 threshold (0.486 and 0.592, respectively); although composite reliability confirmed adequate reliability for both constructs, future studies should consider expanding these subscales with additional items to strengthen internal consistency estimates.

Also, the current sample size may not be large enough to reflect a true representation of the population as such we recommend future studies undertake a larger sample for the study.

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Table 7. Cross-Loadings Matrix (18 Retained Indicators)

Table 5 presents the cross-loadings for all 18 retained indicators. All indicators load highest on their intended construct (bold, green diagonal), confirming the cross-loading criterion of discriminant validity.

Item	Own Construct	MMS	DPS	DCA	DFR	BOE	FIP
MMS1	**MMS**	**0.862**	0.117	0.257	0.266	0.101	0.145
MMS2	**MMS**	**0.784**	0.061	0.138	0.322	0.110	0.118
MMS3	**MMS**	**0.925**	0.066	0.187	0.383	0.109	0.092
DPS1	**DPS**	0.046	**0.823**	0.093	0.151	0.207	0.042
DPS2	**DPS**	0.109	**0.802**	-0.020	0.000	0.242	0.142
DCA2	**DCA**	0.081	-0.167	**0.736**	0.135	-0.103	0.060
DCA3	**DCA**	0.072	0.069	**0.734**	0.170	-0.040	0.204
DCA4	**DCA**	0.338	0.179	**0.757**	0.572	-0.019	0.123
DFR1	**DFR**	0.285	0.056	0.391	**0.882**	0.136	0.150
DFR2	**DFR**	0.384	0.111	0.328	**0.893**	0.176	0.115
BOE2	**BOE**	0.259	0.180	-0.029	0.135	**0.719**	0.249
BOE3	**BOE**	0.055	0.019	0.008	0.198	**0.735**	0.260
BOE4	**BOE**	-0.020	0.296	-0.150	0.081	**0.765**	0.069
BOE5	**BOE**	0.035	0.414	-0.097	0.113	**0.740**	0.156
BOE6	**BOE**	0.126	0.117	0.003	0.116	**0.747**	0.051
FIP1	**FIP**	0.142	0.001	0.174	0.192	0.205	**0.845**
FIP2	**FIP**	0.159	0.207	0.183	0.135	0.121	**0.804**
FIP3	**FIP**	0.028	0.093	0.069	0.021	0.199	**0.788**

Note. Bold green = indicator's loading on its own construct. All 18 indicators load highest on their intended construct, satisfying the cross-loading criterion for discriminant validity.

Table 8. Item Purification Sequential Removal Procedure

Step	Item Removed	Construct	Loading at Removal	Reason
1	**DCA1**	**DCA**	0.480	Loading < 0.50; severe contributor to AVE < 0.50
2	**MMS4**	**MMS**	0.518	Loading < 0.60; weak reflective indicator
3	**BOE1**	**BOE**	0.548	Loading < 0.60; reducing AVE below threshold
4	**DFR4**	**DFR**	0.584	Loading < 0.60; cross-loading on BOE (0.457)
5	**DPS3**	**DPS**	0.587	Loading < 0.60; out-of-range values corrected (8→5); lowest loading remaining
6	**BOE7**	**BOE**	0.626	Loading < 0.708; AVE remained < 0.50 after prior removals
7	**DFR3**	**DFR**	0.679	Loading < 0.708; keeping DFR AVE above 0.50

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8	**FIP4**	**FIP**	0.682	Loading < 0.708; cross-loading on DPS (0.430)
9	**DPS4**	**DPS**	0.686	Loading < 0.708; 13 values corrected from 0→1; weakest remaining
10	**FIP5**	**FIP**	0.701	Loading < 0.708; AVE below 0.50 without removal
11	**FIP6**	**FIP**	0.705	Loading < 0.708; ensures AVE ≥ 0.50 for FIP
Result: 29 original items → 18 retained items across 6 constructs. All loadings ≥ 0.708, all AVE ≥ 0.50, all ρ_c ≥ 0.70. Model ready for structural path analysis.				

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