

THE INFLUENCE OF DIGITAL PAYMENT ADOPTION AND FINANCIAL LITERACY ON CASH MANAGEMENT EFFECTIVENESS AMONG MSMEs: AN EMPIRICAL INVESTIGATION IN MEDAN DELI DISTRICT

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Abstract:

Micro, Small, and Medium Enterprises (MSMEs) constitute the foundational engine of economic resilience in emerging markets, yet their sustainable growth is frequently constrained by informal financial practices and suboptimal cash management. This empirical study investigates the partial and simultaneous effects of digital payment adoption (Quick Response Code Indonesian Standard [QRIS], mobile banking, and e-wallets) and financial literacy on the effectiveness of cash management among MSME entrepreneurs in Medan Deli District, Medan City, North Sumatra, Indonesia. Employing an explanatory associative quantitative survey design, empirical data were gathered through structured 5-point Likert scale questionnaires administered to a representative sample of 100 MSME owners calibrated using the Slovin formula from a target population of 4,003 registered micro-enterprises across five sub-districts (Kota Bangun, Titipapan, Tanjung Mulia, Tanjung Mulia Hilir, and Mabar). Instrument testing confirmed robust construct validity across all 30 items via Pearson Product-Moment correlation (r -count ranging from 0.278 to 0.787, exceeding r -table = 0.196 at $p < 0.05$) and high internal consistency via Cronbach's Alpha (digital payment adoption $\alpha = 0.877$; financial literacy $\alpha = 0.861$; cash management effectiveness $\alpha = 0.903$). Econometric diagnostics satisfied classical assumptions, demonstrating residual normality via the Kolmogorov-Smirnov test and bell-shaped histogram, absence of multicollinearity (Tolerance = 0.412 > 0.10; VIF = 2.430 < 10.00), and homoscedastic residual variance (Glejser $p = 0.094$ for digital payment; $p = 0.182$ for financial literacy). Multiple linear regression analysis generated the empirical model: $Y = 3.453 + 0.432X_1 + 0.599X_2 + e$. Partial hypothesis testing (t -test) revealed that digital payment adoption exerts a positive and statistically significant effect on cash management effectiveness (t -count = 4.539 > t -table =

1.984; $p < 0.001$; standardized $\beta = 0.366$), demonstrating that digitized transaction channels streamline cash inflow tracking, eliminate physical cash handling risks, and reduce transaction friction. Furthermore, financial literacy exerts a positive and statistically significant influence on cash management effectiveness ($t\text{-count} = 6.775 > t\text{-table} = 1.984$; $p < 0.001$; standardized $\beta = 0.547$), indicating that cognitive financial competence represents the dominant predictor governing budgeting discipline, cash flow forecasting, and working capital solvency. Simultaneously, the ANOVA F-test confirmed that digital payment adoption and financial literacy jointly exert a profound, statistically significant effect on cash management effectiveness ($F\text{-count} = 138.115 > F\text{-table} = 3.090$; $p < 0.001$). The coefficient of determination ($R^2 = 0.740$; Adjusted $R^2 = 0.735$; Pearson $R = 0.860$) indicates that 74.0% of the variance in MSME cash management effectiveness is directly explained by the combined predictors, leaving 26.0% governed by external factors such as enterprise age, access to formal bank credit, and market competition. In conclusion, digital payment technology and financial literacy operate synergistically to professionalize informal enterprise accounting. Consequently, municipal governments, banking institutions, and merchant fintech providers should coordinate targeted financial education workshops and QRIS merchant onboarding to enhance grassroots economic sustainability.

1. INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs / Usaha Mikro, Kecil, dan Menengah) constitute the indisputable socio-economic backbone and prime catalyst of economic resilience in developing countries, particularly in Indonesia. Defined under Law Number 20 of 2008 as productive, autonomous economic entities operated by individuals or business groups, MSMEs account for over 99% of total national enterprise units, absorb approximately 97% of the domestic workforce, and contribute upwards of 61% to Indonesia's Gross Domestic Product (GDP) (Yolanda & Hasanah, 2024). In urban economic ecosystems, MSMEs provide vital consumer goods, neighborhood retail distribution, culinary services, and informal labor absorption. However, despite their monumental macro-level contribution, the vast majority of micro-enterprises operate within informal operational structures, characterized by low technological penetration, inadequate record-keeping, and chronic financial management inefficiencies (Faiza, 2023; Safira et al., 2024).

In financial accounting and corporate governance theory, cash represents the most critical, liquid, and vulnerable current asset held by any commercial entity (Dwi et al., 2012; Brigham, 2023). Cash management encompasses the continuous discipline of planning cash

requirements, controlling operational inflows and outflows, accelerating collections, ensuring optimal liquidity balances, and avoiding both cash shortages and unproductive idle cash holdings (Horne & Wachowicz, 2016; Sari & Mildawati, n.d.). In small enterprise operations, effective cash management serves as the fundamental boundary separating business survival from premature bankruptcy. Micro-enterprises frequently fail not due to an absence of commercial sales demand or lack of profitability on paper, but because of cash flow insolvencies—specifically the inability to settle immediate operational obligations, procure inventory restocking, or honor utility bills resulting from poor cash conversion cycles and commingled personal-business finances (Pratama & Susilowati, 2024; Suryani & Marlina, 2021).

The contemporary retail landscape in Indonesia is undergoing a structural digital transformation, driven by the central bank's (Bank Indonesia) Payment Systems Blueprint 2025 and the rapid adoption of the Quick Response Code Indonesian Standard (QRIS) alongside mobile banking and electronic wallets (e.g., GoPay, OVO, DANA, ShopeePay) (Bank Indonesia, 2019, 2023). Digital payment platforms offer micro-enterprises unprecedented operational efficiencies: enabling real-time contactless fund settlement, eliminating the risks of receiving counterfeit banknotes, providing automated digital transaction logs, removing the administrative hassle of providing physical cash change, and expanding consumer purchasing access (Aini et al., 2018; Putri & Rachma, 2021; Abidin, 2024). Empirical studies by Samosir et al. (2023) and Utami (2021) demonstrate that merchant QRIS integration streamlines working capital monitoring by providing transparent, immutable transaction histories that reduce cash leakage.

However, technological payment adoption alone is insufficient to guarantee optimal cash governance unless complemented by cognitive financial capability, known as financial literacy. According to the Financial Services Authority of Indonesia (OJK, 2016, 2022) and international frameworks (Xu & Zia, 2012; Annamalai, 2016), financial literacy represents the composite knowledge, cognitive skills, and psychological confidence that shape individual attitudes and behaviors in financial planning, budgeting, calculation of credit costs, and risk management. Findings from the National Financial Literacy and Inclusion Survey (SNLIK 2022) revealed that although digital payment access (financial inclusion) has accelerated, basic financial literacy among micro-entrepreneurs remains relatively underdeveloped. Many business owners adopt digital QRIS barcodes purely for customer convenience without utilizing generated transaction reports to calculate gross margins, establish cash budgets, or separate household expenditures from business cash flows (Bhushan & Medury, 2013; Zulbetti et al., 2019; Ismanto et al., 2019).

Medan City, as the largest commercial and trading hub in Western Indonesia, exhibits a highly vibrant MSME landscape. Among its administrative regions, Medan Deli District represents one of the dense commercial, industrial, and residential corridors, hosting a substantial concentration of micro-enterprises. Official municipal census data from the Department of Cooperatives and MSMEs of Medan City (2021) document an aggregate of 4,003 active MSME units operating within Medan Deli District across diverse commercial sectors (Table 1).

Table 1. Distribution of MSME Population Across Districts in Medan City (2021 Benchmark)

Sub-District / Sector	Agriculture & Fishery	Fashion & Apparel	Wholesale & Retail Trade	Automotive Services	Culinary & Food Services	Total MSME Units
Medan Amplas	554	450	620	765	605	2,389 units
Medan Area	285	667	589	660	911	2,201 units
Medan Belawan	662	493	596	621	733	2,372 units
Medan Deli (Study Site)	879	1,500	967	657	1,102	4,003 units*
Medan Helvetia	630	955	773	387	712	2,745 units
Medan Marelán	749	493	559	638	857	2,439 units
Medan Selayang	697	550	398	660	775	2,305 units
Medan Timur	674	397	739	250	725	2,060 units
Total Across Medan City	9,021	9,890	12,987	8,294	13,634	53,826 units

As compiled in Table 1, Medan Deli District possesses the single largest concentration of MSME establishments across the entire Medan metropolitan area, totaling 4,003 units (representing 7.44% of the citywide total), with major concentrations in fashion apparel (1,500 units), food culinary services (1,102 units), and retail commerce (967 units). Despite this dense commercial footprint, preliminary field observations across Medan Deli's commercial sub-districts (Kota Bangun, Titipapan, and Tanjung Mulia) reveal an acute managerial dichotomy: while static QRIS barcode stickers and electronic payment accounts are prominently displayed across merchant counters, many entrepreneurs continue to experience severe cash management frictions. Business cash flows remain commingled with

personal family finances, physical cash registers experience unexplained shortages, daily sales receipts are not systematically reconciled, and reserve liquidity for inventory re-orders is frequently depleted.

Prior empirical literature on this nexus reveals varied and inconsistent insights (research gap). Pratiwi et al. (2023) documented that digital payments and financial literacy positively affect cash management in Pangkalpinang. Sari (2022) found that financial technology and literacy significantly enhanced cash control among MSMEs in Medan Marelan. Conversely, studies by Amin (2026) and Huda et al. (2023) reported that financial literacy or fintech adoption had insignificant or weak direct effects on operational cash stability, arguing that working capital scale, inventory turnover, and owner lifestyle are more decisive. Given these conflicting findings and the vital socioeconomic importance of Medan Deli's merchant community, this study conducts an empirical investigation examining the influence of digital payment adoption and financial literacy on cash management effectiveness among MSMEs in Medan Deli District.

2. RESEARCH METHOD

2.1 Research Design, Population, and Sampling Framework

This research utilized an explanatory associative quantitative survey design (Sugiyono, 2020, 2022). The study population comprised all registered MSME establishments operating within Medan Deli District, Medan City, totaling 4,003 business units across five commercial sub-districts (Kota Bangun, Titipapan, Tanjung Mulia, Tanjung Mulia Hilir, and Mabar) (Dinas Koperasi dan UMKM Kota Medan, 2021). Sample size determination was executed using the Slovin formula with a 10% margin of error ($e = 0.10$):

$$n = N / [1 + N(e)^2] = 4,003 / [1 + 4,003(0.10)^2] = 4,003 / [1 + 40.03] = 4,003 / 41.03 = 97.56 \approx 100 \text{ respondents.}$$

A purposive sampling technique was applied with inclusion criteria: (1) Active business owner operating within Medan Deli District; (2) Enterprise categorized under micro or small business classifications; (3) Continuously active in operations for a minimum of six months; and (4) Actively adopting at least one digital payment method (QRIS, e-wallet, or mobile banking) for customer transactions.

2.2 Operational Definitions and Measurement Scales

Variables were operationalized into structured questionnaire indicators evaluated on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree), summarized in Table 2.

Table 2. Operational Definitions, Measurement Indicators, and Scale of Variables

Variable Dimension	Conceptual Definition	Measurement Parameters / Indicators	Scale & Item Count

Digital Payment Adoption (X1)	Utilization of electronic payment instruments, mobile wallets, and QRIS systems to execute commercial sales transactions (Bank Indonesia, 2023; Rahmawati & Pratama, 2024)	1. Perceived ease of use; 2. Transaction speed; 3. Transaction security; 4. Cost and time efficiency; 5. Perceived operational usefulness	5-Point Likert Scale (10 items)
Financial Literacy (X2)	Knowledge, skills, and confidence to manage financial resources effectively and make informed economic decisions (OJK, 2022; Zulbetti et al., 2019)	1. Knowledge of financial institutions; 2. Understanding of financial products/services; 3. Financial calculation skills; 4. Financial decision-making; 5. Trust in financial institutions	5-Point Likert Scale (10 items)
Cash Management Effectiveness (Y)	Proficiency in planning, controlling, recording, and allocating cash resources to support operations and liquidity (Horne & Wachowicz, 2016; Putri & Santoso, 2020)	1. Cash planning; 2. Cash flow control; 3. Timely and accurate cash recording; 4. Efficient cash utilization; 5. Operating liquidity availability	5-Point Likert Scale (10 items)

2.3 Econometric Model and Statistical Testing Protocol

Data processing was executed using IBM SPSS Statistics software following a structured econometric sequence: (1) Instrument testing via Pearson Product-Moment correlation validity and Cronbach's Alpha reliability; (2) Classical assumption diagnostics, comprising Kolmogorov-Smirnov residual normality, Tolerance/VIF multicollinearity, and Glejser heteroscedasticity tests; (3) Multiple Linear Regression Analysis using the structural equation:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + e$$

and (4) Hypothesis testing comprising the partial t-test, simultaneous ANOVA F-test, and Coefficient of Determination (R^2 / Adjusted R^2) evaluated at $\alpha = 0.05$.

3. DISCUSSION

3.1 The Operational Mechanism of Digital Payments in Cash Governance

The empirical finding that digital payment adoption significantly enhances cash management effectiveness ($t = 4.539$, $p < 0.001$, $b_1 = 0.432$) confirms Technology Acceptance Model (TAM) premises within urban retail environments. Digital payment instruments—primarily QRIS merchant barcodes, digital merchant wallets (GoPay, OVO, DANA), and mobile banking transfers—directly eliminate the physical friction of cash

administration. By shifting daily customer settlements into digital channels, micro-entrepreneurs bypass traditional cash-handling vulnerabilities: manual cash counting errors, the operational burden of storing physical coin/banknote change, counterfeit currency acceptance, and cash drawer theft (Aini et al., 2018; Utami, 2021).

Crucially, mobile payment gateways generate real-time digital transaction histories. For micro-enterprises lacking formal double-entry bookkeeping systems, these digital ledgers function as automated daily sales journals. Owners can instantly review aggregate daily inflows, monitor peak customer transaction hours, and transfer operating revenues into designated supplier bank accounts without visiting commercial bank branches. These results corroborate prior empirical findings by Pratiwi et al. (2023), Dahniyar Letta Sari (2022), and Samosir et al. (2023), confirming that digital payment adoption serves as a foundational operational catalyst for small enterprise financial formalization.

3.2 The Dominant Role of Financial Literacy in Budgeting and Solvency

The finding that financial literacy exerts the dominant positive effect on cash management effectiveness ($t = 6.775$, $p < 0.001$, $b_2 = 0.599$, $\beta = 0.547$) underscores that cognitive managerial competence is the ultimate arbiter of working capital discipline. Technology provides transaction mechanics, but human decision-making dictates capital allocation. Micro-entrepreneurs possessing higher financial literacy consistently demonstrated superior cash management practices: they actively drafted periodic cash budgets, separated business revenue from personal household consumption, maintained dedicated cash reserves for supplier re-orders, and understood the costs of informal trade debts (OJK, 2022; Zulbetti et al., 2019; Ismanto et al., 2019).

Conversely, micro-owners with deficient financial literacy frequently fall victim to cash illusion: treating high gross daily sales as disposable personal income without accounting for pending supplier payables or inventory depreciation. This insight aligns with findings by Faiza (2023) and Marviana et al. (2020), demonstrating that basic financial education equips micro-entrepreneurs with the cognitive tools necessary to maintain positive net operating cash flows.

3.3 The Synergistic Model: Technology-Driven and Knowledge-Anchored Cash Management

The simultaneous econometric model ($F = 138.115$, $p < 0.001$, $R^2 = 0.740$) validates the theoretical proposition that digital infrastructure and human cognitive capital operate synergistically. Digital payment adoption provides the operational transparency, speed, and real-time data required for modern accounting, while financial literacy provides the cognitive framework to interpret that data, control discretionary spending, and maintain liquidity solvency. When micro-entrepreneurs combine both capabilities, cash management effectiveness increases substantially, achieving a 74.0% explanatory power.

4. CONCLUSION

Based on the empirical findings, econometric regression modeling, and in-depth discussion, the conclusions of this study are established as follows:

1. Digital payment adoption partially exerts a positive and statistically significant effect on cash management effectiveness among MSMEs in Medan Deli District ($t\text{-count} = 4.539 > t\text{-table} = 1.984$; $p < 0.001$). Digital settlement channels eliminate physical cash handling risks and automate transaction logging.

2. Financial literacy partially exerts a positive and statistically significant effect on cash management effectiveness among MSMEs in Medan Deli District ($t\text{-count} = 6.775 > t\text{-table} = 1.984$; $p < 0.001$), representing the dominant predictor governing cash budgeting and liquidity control.

3. Digital payment adoption and financial literacy simultaneously exert a highly significant effect on cash management effectiveness among MSMEs in Medan Deli District ($F\text{-count} = 138.115 > F\text{-table} = 3.090$; $p < 0.001$), accounting for 74.0% of cash management effectiveness variance ($R^2 = 0.740$; Adjusted $R^2 = 0.735$).

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