



Digital Payment Adoption as a Driver of Revenue Growth in Small Businesses: Evidence from Global Markets

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Abstract

This study addresses the problem that small businesses increasingly adopt digital payment tools, yet decision makers lack evidence on whether deeper adoption using cloud-based and enterprise payment solutions translates into revenue growth. The purpose was to test the impact of Digital Payment Adoption Intensity (DPAI) on revenue growth and to explain when and how this effect occurs. Using a quantitative cross-sectional, case-based design, data were collected from $N = 312$ SMEs across retail (41.7%), services (38.1%), and mixed trade/logistics (20.2%) cases. Key variables included DPAI ($M = 3.68$, $SD = 0.71$), trust/security perception ($\alpha = .86$), fee burden ($\alpha = .81$), customer reach ($\alpha = .84$), operational efficiency ($\alpha = .85$), and perceived revenue growth ($\alpha = .83$), with overall scale reliability acceptable across constructs ($\alpha = .81$ to $.88$). The analysis plan applied descriptive statistics, reliability testing, Pearson correlations, multiple regression with controls (firm size, firm age, sector, location, digital readiness), bootstrapped mediation, and moderation via interaction terms, supported by a placebo specificity test. Headline findings show that DPAI was associated with revenue growth ($r = .52$, $p < .001$) and remained significant in the controlled model ($\beta = .38$, $t = 7.92$, $p < .001$; Adjusted $R^2 = .32$). Mechanism tests indicated partial mediation through customer reach (indirect effect = 0.11, 95% CI [0.06, 0.17]) and operational efficiency (indirect effect = 0.08, 95% CI [0.03, 0.14]). Boundary conditions mattered: trust/security strengthened returns to adoption (DPAI \times Trust $\beta = .12$, $p = .004$), while fee burden weakened them (DPAI \times Fees $\beta = -.10$, $p = .011$). A typology check showed a clear dose-response pattern where high adopters reported higher growth ($M = 3.89$) than low adopters ($M = 3.12$). Implications suggest SMEs should prioritize operational integration and trust-building while actively managing transaction fees, and providers and policymakers should support secure, reliable, and affordable payment infrastructures to unlock measurable growth benefits.

Keywords

Digital Payment Adoption Intensity (DPAI), SME revenue growth, customer reach, operational efficiency, trust and security;

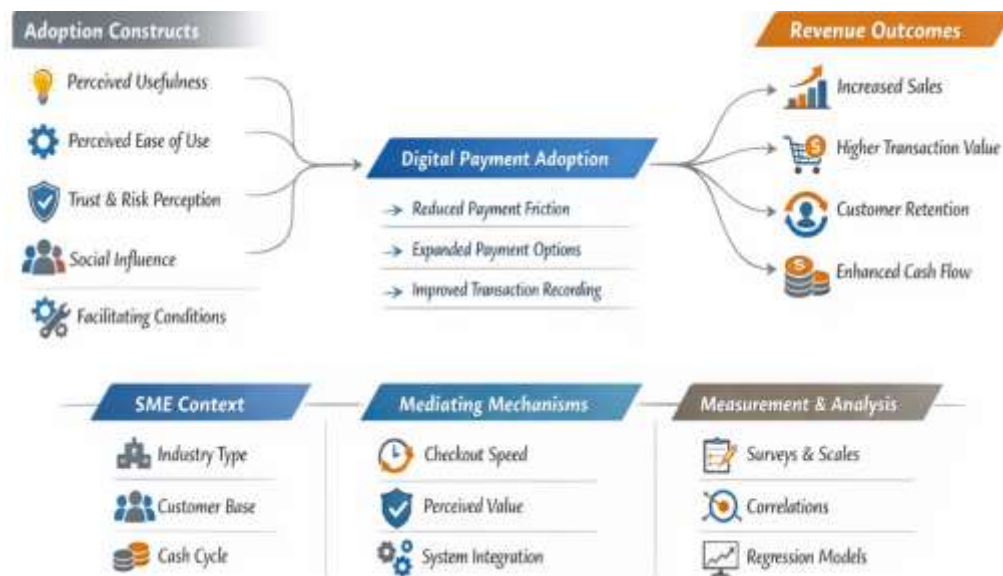
INTRODUCTION

Digital payments are commonly defined as monetary value transfers executed through electronic channels and governed by interoperable rules, authentication, and settlement infrastructures that replace or augment cash and paper-based instruments at the point of sale, online, or through person-to-person rails (Abrahão et al., 2016). In applied business research, the term typically covers payment cards, online transfers, mobile payments, and mobile money, while “digital payment adoption” denotes the organizational decision to accept, use, and routinize such instruments in revenue-generating activities through devices, platforms, and workflows (Baganzi & Lau, 2017). Mobile payments can be framed as transactions initiated and authorized via mobile devices using wireless networks or proximity interfaces, and they are frequently treated as a class of payment innovation whose value depends on ubiquity, speed, convenience, and perceived security in real purchase settings (Dahlberg et al., 2008). Adoption research further distinguishes user-side and merchant-side diffusion, because consumers experience interface utility and trust at checkout while firms experience cost structures, reconciliation burden, acceptance infrastructure, chargeback exposure, and data visibility in accounting processes (Gomber et al., 2017). A complementary stream in banking and payment economics links electronic payment intensity with efficiency gains and reduced operational costs, emphasizing that payment technology substitution can be associated with measurable changes in transaction processing costs at scale (Humphrey et al., 2006). Within this backdrop, small and medium-sized enterprises (SMEs) occupy a distinctive position in global commerce: they operate with tight cash cycles, limited administrative capacity, and high sensitivity to frictions in receiving payments, making their payment acceptance decisions materially consequential for revenue realization, customer conversion, and repeat purchasing patterns (Liébana-Cabanillas et al., 2014). In developing and developed contexts alike, mobile and electronic payments are positioned as tools that compress time-to-cash, widen customer reach, and formalize transaction records that can inform pricing, inventory decisions, and credit access, with empirical work documenting how SMEs integrate mobile money into daily operating routines and how usage patterns vary by business type and transaction needs (Slade et al., 2015). At the same time, organizational adoption is rarely a single event; it is an accumulation of technical setup, staff training, customer signaling, and trust-building that influences the rate at which digital payments shift from “available” to “dominant” in revenue collection (Higgins et al., 2012).

From an international significance perspective, the diffusion of digital payments intersects with cross-border trade, platform economies, diaspora remittances, tourism flows, and the operational realities of SMEs that increasingly transact with customers and suppliers beyond local neighborhoods. Comparative payment-system scholarship shows that as electronic payment shares rise, the structure of costs and the organization of retail and banking operations can change in economically meaningful ways, providing a macro-foundation for examining firm-level revenue consequences (Lu et al., 2011). At the micro level, payment instruments are part of the “service encounter,” affecting whether a customer completes a purchase when cash is unavailable, whether queue time discourages demand, and whether the perceived legitimacy of the merchant is strengthened through professional checkout options and receipts (Shaw, 2014). Qualitative evidence on mobile payments highlights situational advantages such as time-and-place independence and queue avoidance, which connect directly to realized sales in high-frequency retail environments. Research on mobile wallets and mobile payment services also identifies trust as a pivotal mechanism, because payment acceptance is a risk-bearing interaction involving sensitive credentials, potential fraud, and dependence on infrastructure reliability (Sharma et al., 2018). These trust and risk processes are international in character: they vary with regulatory environments, consumer norms, and the maturity of payment ecosystems, while firms face similar operational questions everywhere, including fee tolerance, settlement delays, dispute management, and the integration of payment records with bookkeeping (Mallat, 2007).

Empirical studies across contexts consistently treat perceived usefulness, ease of use, compatibility, and risk as recurring determinants of adoption and continued usage, framing digital payment acceptance as both a technological and a market-facing capability (Talom & Tengeh, 2020). In this sense, digital payment adoption among SMEs is not only a technology choice but also a strategic commercial choice that can influence market access and revenue stabilization through changes in transaction completion probability, customer convenience, and the informational trace left by digitized sales (Venkatesh et al., 2012).

Figure 1: Digital Payment Adoption and SME Revenue Growth



A rigorous way to situate SME digital payment adoption within established theory is to treat adoption as an interaction between performance expectations, effort expectations, social influence, facilitating conditions, and habit formation that shape usage intensity once acceptance infrastructure is installed. UTAUT2 is frequently used to explain consumer technology use in market settings by extending earlier technology acceptance logic with hedonic motivation, price value, and habit, and it offers constructs that can be mapped to payment experiences such as checkout speed, perceived value relative to fees, and routinized repeat usage (Mallat & Tuunainen, 2008). Within payment research, UTAUT-style constructs have been operationalized for remote mobile payments and related services, with evidence that performance expectancy, social influence, innovativeness, and perceived risk can shape adoption intentions in real consumer populations (Mbogo, 2010). Merchant-side research complements this by detailing organizational inhibitors and drivers such as integration complexity, perceived demand, and the distribution of costs and benefits between payment actors (Yang et al., 2011). Trust and flow perspectives deepen this theoretical grounding by showing that users' willingness to transact is shaped by structural assurance and quality perceptions, and that experiential smoothness during payment interactions can influence usage intention and actual usage behavior (Oliveira et al., 2016). In addition, continuance research on mobile payment services emphasizes post-adoption dynamics, showing that service quality, system quality, information quality, satisfaction, and trust are tied to ongoing use, which is critical when the research focus is revenue growth rather than one-time adoption. In an SME revenue framework, these theories motivate constructs that link adoption intensity to sales outcomes through mechanisms like reduced payment friction, increased conversion, stronger repeat purchasing, and improved transaction recording for managerial control. A theory-driven introduction is also practically aligned with Likert-scale measurement strategies, because constructs like trust, risk, expectancy, and perceived value are operationalized as latent variables that can be connected to observed firm outcomes using correlation and regression modeling within a cross-sectional case-study design (Zhou, 2012).

The study of digital payments also benefits from a clear conceptual distinction between the payment instrument, the acceptance channel, and the organizational capability that turns acceptance into measurable revenue growth. The instrument refers to what the customer uses (card, wallet, mobile money account), the channel refers to how it is executed (QR, NFC, app-based transfer, online gateway), and the capability refers to the firm's ability to implement, signal, reconcile, and leverage the payment method for sales and operations (Zhou, 2013). Evidence from consumer and merchant research indicates that adoption depends on perceived compatibility with purchase contexts, the relative advantage compared to cash, and the fit between the payment solution and the firm's transaction profile. In developing-economy contexts, mobile payment and mobile money services have been studied as pragmatic financial tools used by micro and small businesses for transfers, supplier payments, and customer receipts, with empirical findings connecting convenience, accessibility, cost, support, and security to usage that supports business success and growth (Ooi & Tan, 2016). SME usage patterns research similarly documents that enterprises adopt mobile money for transactional functions that align with their cash-flow needs, and that adoption is associated with how frequently the business sends and receives payments, its customer mix, and its need for rapid liquidity (Schierz et al., 2010). In more digitized ecosystems, mobile wallet adoption research positions trust as a mediating mechanism between antecedents (learning, perceived control, risk perceptions) and intention to use, which is important because SMEs depend on customer willingness to complete the transaction at the moment of sale. This supports a conceptualization of "digital payment adoption" as a multidimensional construct that includes availability of acceptance, breadth of accepted methods, intensity of use, and operational integration with accounting and customer management. For revenue growth analysis, this conceptual framing is essential because it ties adoption to specific channels through which revenue can increase: higher completed transactions, larger basket sizes through broader payment options, and more predictable receivables via faster settlement (Sharma et al., 2018). Empirical work on mobile payment adoption and continuance reinforces that the quality of system and services influences trust and satisfaction, which shapes continued use and therefore the sustained presence of digital payments in revenue collection rather than occasional use (Talom & Tengeh, 2020).

A research title that targets "revenue growth in global business" also implies attention to the broader digital finance environment in which SMEs operate (Gomber et al., 2017). Digital finance scholarship describes fintech-enabled services as reshaping financial products and customer interaction models, influencing how firms access payment rails, data, and complementary services such as lending and financial management tools (Lu et al., 2011). This matters for SMEs because payment acceptance is increasingly bundled with analytics dashboards, inventory links, loyalty tools, and credit offers that depend on digitally recorded sales. Adoption studies of mobile technology for financial use often show that perceived usefulness and perceived ease of use remain central, while perceived risk and security concerns continue to be prominent in payment contexts where losses can be immediate and traceability varies by system design (Schierz et al., 2010). Inhibitor-focused research adds that non-adoption is also patterned and explainable: concerns about safety, habit persistence, lack of perceived need, and ecosystem constraints can hold back wallet usage, which signals that firm-level adoption strategies must be interpreted within an environment of customer readiness and infrastructure maturity (Shaw, 2014). Cross-context evidence further indicates that structural assurance mechanisms shape trust formation, and that improvements in perceived experience can raise intention and actual usage, reinforcing the link between ecosystem trust and realized transaction volume. When SMEs operate across borders or serve internationally exposed customer segments, these ecosystem and trust issues can become even more salient due to currency conversion, card scheme rules, consumer fraud perceptions, and differing regulatory protections (Talom & Tengeh, 2020). A conceptually grounded introduction therefore treats revenue growth as embedded in a layered system: a firm's internal capability to accept and reconcile payments, the customer's willingness to use the method, and the platform and regulatory environment that enables secure settlement and dispute processes. Studies on mobile payment determinants and continuance offer empirical anchors for measuring these layers through survey items and connecting them statistically to performance outcomes (Venkatesh et al., 2012).

In quantitative cross-sectional research that uses Likert-scale constructs, it is also important to clarify how “revenue growth” is conceptualized at the small-business level so that statistical relationships are meaningful and interpretable (Liébana-Cabanillas et al., 2014). In SME contexts, revenue growth can be operationalized as changes in sales turnover, average transaction value, customer retention-linked repeat sales, or perceived revenue improvement over a specified period, captured either through objective figures when available or through validated perceptual performance measures in survey research. The value of digital payment adoption for revenue is frequently theorized through reduction of payment frictions and expansion of customer choice sets at checkout, which is consistent with qualitative and quantitative findings that situational advantages, convenience, and transaction speed influence acceptance and usage (Humphrey et al., 2006). Payment technology substitution research at the banking-system level provides an additional lens by emphasizing that shifting to electronic payments can be associated with cost reductions and operational efficiency improvements, which at the firm level can translate into improved margins and reinvestment capacity that accompany revenue expansion. Merchant adoption research adds nuance by showing that organizational adoption decisions are shaped by both perceived demand and perceived burdens, which indicates that revenue outcomes may vary by adoption intensity and by the fit between the digital payment solution and the business model (Mbogo, 2010). Trust-based models in mobile payment and mobile banking contexts further imply that payment-related trust influences intention and usage, suggesting that revenue effects are intertwined with customer confidence in the payment experience and with the reliability of the firm’s acceptance setup (Abrahão et al., 2016). Empirical adoption studies commonly treat risk and trust as measurable drivers that can be statistically linked to adoption intention, usage, and continuance, allowing cross-sectional data to quantify how these perceptions align with reported performance outcomes (Sharma et al., 2018). By defining revenue growth with operational clarity and linking it to well-established adoption constructs, the introduction creates a coherent bridge between the conceptual model (digital payment adoption → mechanisms such as reduced friction and expanded acceptance → revenue outcomes) and the planned analyses (descriptive statistics, correlations, and regression models).

Within the specific focus on SMEs, the empirical record also points to heterogeneity that motivates case-study-based quantitative designs: the same payment technology can yield different business outcomes depending on sector, transaction frequency, customer demographics, and supply-chain payment needs (Gomber et al., 2017). Merchant adoption studies highlight that adoption is influenced by the organization’s environment and by constraints that differ across industries and merchant types, which supports the logic of examining multiple cases or a bounded case context to interpret variation in results (Liébana-Cabanillas et al., 2014). Evidence from Kenya illustrates that mobile payments and mobile money can be deeply integrated into micro and small business operations, and that the business value is often articulated through convenience, accessibility, cost considerations, and security perceptions tied to daily transactions (Lu et al., 2011). Studies of mobile payment determinants and recommendation intentions indicate that consumer-facing uptake is sensitive to perceived value, effort, and risk, which implies that SME revenue effects depend partly on customer adoption patterns and on how effectively the firm signals and supports the payment method at the point of transaction (Shaw, 2014). Research on mobile wallet inhibitors and adoption barriers reinforces that usage can stall when perceived safety and habit dynamics are unfavorable, suggesting that revenue-related benefits may concentrate among firms that align with customer preferences and reduce perceived barriers through trustworthy implementation practices (Talom & Tengeh, 2020). At the same time, digital finance literature emphasizes that fintech developments expand the landscape of payment products and integration options, increasing the strategic choices facing SMEs even in similar markets (Yang et al., 2011). A study that proposes to quantify the impact of digital payment adoption on SME revenue growth can therefore justify its modeling approach by recognizing that adoption is multi-dimensional, usage is continuous rather than binary, and outcomes may differ across adoption typologies and business contexts, which aligns with regression-based estimation and construct-wise descriptive and correlational testing anchored in validated adoption and trust literature (Zhou, 2013).

This study is structured around clearly defined objectives that translate the broad topic of digital payment adoption into measurable constructs and testable relationships linked to small business

revenue growth. The first objective is to quantify the level of digital payment adoption among small businesses within the selected case-study contexts by capturing adoption as a multi-dimensional phenomenon rather than a simple binary choice. This includes measuring the breadth of payment channels accepted, the frequency of use in daily transactions, the share of sales processed through digital rails, and the degree of operational integration with billing, inventory, and record-keeping routines. The second objective is to assess the statistical association between digital payment adoption and small business revenue growth using construct-wise descriptive statistics and correlation analysis, enabling a clear view of how adoption intensity aligns with reported performance variation across firms. The third objective is to estimate the net effect of digital payment adoption on revenue growth through regression modeling that controls for business and owner characteristics such as firm size, firm age, sector category, location conditions, and digital readiness indicators, ensuring that the measured relationship reflects adoption's incremental contribution beyond baseline differences among enterprises. A fourth objective is to test mechanism pathways that explain how adoption may translate into revenue gains by examining whether customer reach or market access and operational efficiency function as mediating variables that carry the effect of adoption toward revenue outcomes. A fifth objective is to evaluate boundary conditions that may strengthen or weaken the adoption-revenue relationship by testing moderating factors such as perceived trust and security and the perceived burden of transaction costs or service fees, allowing the study to distinguish situations in which adoption yields stronger revenue benefits from those in which benefits are constrained. A sixth objective is to build a Digital Payment Adoption Intensity Index that can be used to classify firms into meaningful adoption typologies, supporting comparisons between low-intensity and high-intensity adopters and making results easier to interpret for academic and practical audiences. A seventh objective is to strengthen the credibility of inference by conducting model diagnostics and robustness checks, including multicollinearity assessment, model fit evaluation, and a falsification or placebo test to confirm that the explanatory power of adoption is aligned with revenue outcomes rather than unrelated firm attributes. Together, these objectives provide a comprehensive analytical pathway from measurement to explanation, ensuring that the study evaluates digital payment adoption as an operational business capability and links it to revenue growth through transparent, verifiable quantitative procedures.

LITERATURE REVIEW

The literature on digital payment adoption and small business revenue growth spans multiple intersecting streams that collectively explain why payment technologies diffuse unevenly across contexts and how their adoption can shape firm-level performance outcomes. At the foundational level, digital payments are discussed as payment innovations that alter transaction execution, settlement speed, record creation, and risk allocation between buyers, sellers, and intermediaries, making them relevant to both operational efficiency and customer experience. A large body of research frames adoption as a socio-technical decision influenced by perceived usefulness, ease of use, compatibility with existing routines, perceived risk, trust, and facilitating conditions, with technology acceptance theories providing the dominant explanatory backbone for modeling intention, use, and continuance behavior. Parallel to this, merchant-side and SME-focused studies emphasize that adoption is shaped by cost structures (device costs, fees, chargebacks), infrastructure constraints (network reliability, electricity, interoperability), customer readiness, and the internal capacity of small firms to implement and maintain new transaction systems. Another important research stream examines performance consequences of digitization at the firm level, including sales growth, customer retention, market expansion, productivity, and improved financial management, while acknowledging heterogeneity across sectors, firm sizes, and market environments. Within this performance literature, digital payments are frequently positioned as a mechanism that reduces payment frictions at the point of sale and expands payment choice, which can influence conversion rates and repeat purchasing, and as a mechanism that generates digital records that support better managerial decision-making and access to formal finance. The global framing of the topic is reinforced by studies that document how payment ecosystems differ across countries in terms of regulation, consumer protection, platform competition, and financial inclusion, shaping both adoption incentives and outcomes for SMEs operating in internationalized markets or serving digitally connected customer segments. Across these streams,

researchers increasingly emphasize the need to treat adoption as continuous and multi-dimensional, rather than binary, by measuring intensity of use, channel diversity, and integration depth, because these distinctions affect the magnitude and stability of observed performance impacts. Methodologically, the literature supports quantitative designs that employ survey-based latent constructs measured through Likert scales combined with econometric modeling to isolate the association between adoption and revenue outcomes under relevant controls. Consequently, an integrated review for this study synthesizes adoption theories, SME constraints, ecosystem factors, and performance pathways into a coherent structure that justifies the conceptual model, clarifies variable selection and measurement, and motivates robust statistical testing of direct, mediated, and moderated effects linking digital payment adoption to small business revenue growth.

Digital Payment Adoption in SMEs

Digital payment adoption in small and medium-sized enterprises (SMEs) refers to the organizational decision and capability to accept and routinely use electronic payment instruments—such as card-based, wallet-based, or account-based transfers—to receive customer funds and manage transaction records as part of regular business operations. In SME contexts, adoption is best understood as a bundle of practices rather than a single installation event: it includes selecting an acceptance method, configuring settlement and reconciliation processes, training staff to handle payment interactions, and communicating availability to customers at the point of sale and across sales channels. This operational view matters because SMEs often operate with thin administrative capacity and tight cash cycles, making payment acceptance decisions closely tied to daily liquidity and transaction completion. Research that models mobile payment intention and usage highlights that users respond to perceived usefulness, perceived ease of use, perceived security, and cost-related considerations, and these determinants are directly relevant to SMEs because merchants must evaluate whether a payment method reduces friction for customers while remaining manageable for staff and affordable within margins (Kim et al., 2010). In parallel, adoption studies that expand classic acceptance models emphasize that affective and social factors can shape willingness to use mobile payments, suggesting that SME adoption outcomes may depend partly on whether customers experience payment methods as convenient, enjoyable, and socially normalized in the purchase environment (Koenig-Lewis et al., 2015). Within SMEs, these demand-side conditions interact with merchant-side realities: the same technology can be beneficial in high-frequency retail settings but less compelling in low-frequency, invoice-driven services, and the operational payoff depends on how often customers request the method, how reliably it functions, and how quickly funds settle into merchant accounts. Accordingly, the SME literature typically positions adoption as a context-sensitive capability that must align with transaction characteristics, customer expectations, and the firm's internal capacity to operationalize the payment channel.

Merchant adoption research further emphasizes that SME decisions are conditioned by the payment ecosystem and by constraints that differ from those faced by individual consumers, including acceptance fees, device or terminal costs, settlement delays, dispute handling, and dependence on network reliability. Organizational perspectives therefore treat adoption as a function of technology attributes, organizational readiness, and environmental pressures, with particular attention to the resource limitations of smaller firms and their exposure to competitive signals in local markets. Evidence from retailer-focused modeling indicates that adoption is often associated with perceived relative advantage, compatibility with store operations, and the quality of support from providers, while organizational factors such as managerial knowledge and internal readiness can differentiate adopters from non-adopters even within the same sector (Al-Saedi et al., 2019). This emphasis on readiness and fit is especially relevant to SMEs that must integrate payment records with bookkeeping, inventory controls, and cash management, because operational misalignment can increase workload and error risk rather than reduce it. Comparative work examining different mobile payment systems suggests that determinants can shift by technology type; for example, subjective norms and perceived usefulness may carry different weights depending on whether a system is SMS-based or proximity-based, implying that SMEs choosing among options should not assume that “mobile payment” is a uniform category (Teo et al., 2017). These findings support a more granular interpretation of SME adoption in which the decision to adopt is shaped by the intersection of business model, transaction

flow, customer demand, and ecosystem maturity. As a result, SME adoption research increasingly highlights that the same firm may adopt multiple methods over time or selectively deploy them across channels (in-store versus online), making “adoption intensity” a more informative descriptor than a simple adopter/non-adopter split.

Figure 2: Digital Payment Adoption In SMEs (Operational Framework)

<p>Payment Methods Adopted Card, Wallet, Account-Based Transfers</p>	<p>Acceptance Breadth In-Store, Online, Multiple Channels</p>
<p>Usage Frequency Low, Medium, High Adoption Intensity</p>	<p>Operational Integration Sales, Records, Accounting Integration</p>

Recent scholarship also argues that understanding SME adoption requires distinguishing not only whether firms adopt, but what form of digital payment they adopt and how deeply it is integrated into sales and record-keeping. This line of work treats payment technologies as heterogeneous in interaction style and infrastructure requirements, which helps explain why adoption patterns and perceived value differ across contexts and sectors. Comparative evidence indicates that determinants and perceived value can differ across SMS, QR, and NFC payment technologies, supporting typologies that capture channel diversity and usage intensity within the same enterprise rather than assuming a single pathway to digitization (Luna et al., 2019). For SMEs, this distinction is practically important because different technologies shift burdens and benefits in different ways: terminal-based solutions may require higher setup costs and ongoing maintenance, while QR-based solutions may reduce hardware costs but depend heavily on customer smartphone readiness and stable connectivity; remote payments can widen market access for online selling but introduce different reconciliation and fraud-management routines than proximity payments. Typology-oriented perspectives therefore motivate measuring adoption as a structured construct that reflects (a) breadth of channels accepted, (b) frequency of digital payment use, (c) share of sales conducted digitally, and (d) integration depth into accounting and operational workflows. This conceptualization fits quantitative designs that seek to explain performance outcomes, because it supports constructing reliable adoption indices and comparing segments of SMEs (low-, medium-, high-intensity adopters) in relation to business metrics. In this way, the SME adoption literature provides both a theoretical rationale and a measurement logic for treating digital payment adoption as a multi-dimensional organizational capability whose drivers and observable consequences depend on technology form, ecosystem support, and the operational fit between the payment method and the SME’s transaction environment.

Small Business Revenue Growth Determinants

Small business revenue growth is widely treated as the outcome of interacting internal and external determinants that shape how effectively a firm converts opportunities into sales, expands customer demand, and sustains repeat purchasing over time. At the internal level, strategic posture is frequently emphasized as a core determinant because it influences how owners allocate scarce resources toward opportunity-seeking activities such as product experimentation, proactive selling, and market exploration. Entrepreneurial orientation has been repeatedly connected to performance variation in small firms, with evidence indicating that its relationship to growth becomes clearer when it is examined alongside financial capital and the level of environmental dynamism that conditions the payoffs of entrepreneurial behavior (Manam & Ashfaq, 2022; Wiklund & Shepherd, 2005). This insight reinforces a practical view of revenue growth in SMEs as a function of both strategic intent and the capacity to execute that intent through funding, managerial attention, and timely decision-making. A broader integrative view of small business growth also highlights that revenue expansion is not driven by a single factor; rather, it emerges from linked influences across the individual level (human capital and attitudes), the firm level (resources and strategic orientation), and the environment (industry structure and changes in competitive or demand conditions), with multiple pathways operating simultaneously and sometimes indirectly through strategic orientation (Khaled, 2021; Wiklund et al., 2009). For empirical research that targets revenue growth, these perspectives provide a structured logic for selecting determinants that can be measured and controlled, including owner-manager experience, resource availability, and environmental conditions. They also support modeling approaches that acknowledge heterogeneity, since firms with similar size and sector can exhibit different revenue trajectories due to differences in strategic aggressiveness, managerial cognition, and the way opportunities are perceived and pursued. In this way, revenue growth determinants literature establishes a baseline explanation of performance that is essential when isolating the incremental contribution of a specific capability such as digital payment adoption in later analyses.

Figure 3: Small Business Revenue Growth Determinants



Innovation capability and operational practices represent another major cluster of determinants that shape revenue growth in SMEs by influencing product attractiveness, process efficiency, and the firm's ability to respond to customer needs. In manufacturing and service settings, innovation practice has been linked to performance outcomes through a resource-based lens, suggesting that SMEs that develop and deploy distinctive capabilities—such as continuous improvement routines, quality management practices, and structured innovation activities—can enhance competitiveness and

generate stronger performance results (Binte & Sazzadul, 2022; Terziowski, 2010). This strand is important for revenue growth analysis because it points to mechanisms through which SMEs can raise sales by differentiating offerings, improving reliability, shortening service cycles, and strengthening customer satisfaction, all of which can translate into higher purchase frequency and broader market reach. The same determinant cluster also connects to managerial systems such as accounting discipline, inventory control, and customer management routines that influence how effectively a firm learns from sales information and adapts pricing and stock decisions to demand signals. In quantitative studies, such determinants are commonly represented through proxies such as firm age, size, sector category, and indicators of managerial capability, because these correlate with the likelihood that a firm can sustain systematic innovation and consistent operations. From a revenue-growth perspective, the literature suggests that SMEs face a practical threshold problem: limited slack resources mean that growth often depends on identifying a small number of high-leverage practices that improve conversion and retention without adding excessive overhead. This is particularly relevant to business environments where customer acquisition costs are rising and competition is intense, since operational excellence and innovation can reduce customer churn and stabilize repeat sales. In the context of this research, these determinants provide essential controls because they can explain revenue growth differences that would otherwise be mistakenly attributed to payment adoption alone, especially when firms differ in managerial sophistication or in their ability to implement new systems that complement sales activity.

Financial structure and access to finance constitute a third determinant family that shapes SME revenue growth by affecting working capital stability, investment capacity, and resilience to demand volatility. Empirical evidence focusing on SME growth and financing emphasizes that liquidity conditions and solvency signals influence growth capacity, and that widening access to finance can be associated with measurable changes in SME growth outcomes when firms are able to secure funding aligned with their operating needs (Moreira, 2016). This line of research positions finance as more than a background condition: it directly affects inventory purchasing, marketing spend, staffing decisions, and the ability to endure seasonal downturns, all of which influence realized sales volume. Complementing this, studies examining SME growth and financing sources identify cash flow as a prominent stimulating factor while highlighting restrictive effects associated with debt burden, firm size, firm age, and interest rate conditions, indicating that revenue growth is often constrained by the cost and structure of capital even when market opportunities exist (Serrasqueiro et al., 2018). These findings underline the importance of modeling financial and structural controls in revenue growth research, because growth can accelerate when internal cash generation is strong and financing costs are manageable, while growth can slow when debt servicing absorbs cash that would otherwise fund expansion. In applied empirical designs, these determinants are typically represented through firm-level variables (age, size, debt reliance) and contextual variables (macroeconomic conditions and financing climate), and they provide a grounded explanation for why two otherwise similar SMEs can experience very different sales trajectories. For the present study, the financial-determinants literature clarifies why payment-related capabilities should be evaluated alongside controls that capture financing pressure and operating scale, since revenue growth is strongly shaped by liquidity and capital constraints that also influence a firm's willingness to invest in adoption-related costs and training.

Digital Payment Adoption and Small Business Revenue Growth Mechanisms

Digital payment adoption can be treated as a revenue-shaping operational capability because it changes the friction, certainty, and visibility of the sales transaction at the point of exchange. At the most basic level, accepting cards, wallets, and other cashless instruments expands the set of customers who can complete a purchase when cash is unavailable or inconvenient, turning purchase intention into realized turnover. From the merchant perspective, the acceptance decision is embedded in a two-sided payment environment in which consumers carry and prefer certain instruments, and merchants calibrate acceptance to anticipated demand and cost. Transaction-level evidence shows that when card acceptance is absent, cash use remains high for low-value purchases, implying that some potential sales are constrained by the payment method available at checkout (Arango et al., 2015). This micro-mechanism is central for small firms that rely on high-frequency, low-ticket transactions, where even modest frictions can accumulate into meaningful revenue losses over time. Beyond conversion, digital

payments can influence revenue growth by shifting purchasing patterns. When checkout becomes faster and perceived payment effort falls, customers may increase basket size, make add-on purchases, or return more often, especially in convenience retail and food services. Digital payments also reduce the need to hold and manage large cash floats, lowering time spent on cash counting, bank trips, and reconciliation. For resource-constrained owners, these saved hours can be redeployed to selling, service quality, and customer acquisition activities that directly affect top-line revenue. Finally, electronic payment records create verifiable sales histories that can improve internal control and performance monitoring, enabling more disciplined pricing, inventory replenishment, and promotion evaluation. In combination, these channels motivate the expectation that digital payment adoption is positively associated with small business revenue growth in global markets. In panel settings, these effects can be observed as within-firm revenue lifts following adoption. Consistently.

Figure 4: Digital Payment Adoption And Small Business Revenue Growth Mechanisms



Recent quasi-experimental and administrative-data studies strengthen the causal argument that adopting modern payment acceptance technologies can raise merchant sales outcomes, particularly among smaller firms. Using a large merchant sample and combining score matching with difference-in-differences estimation, [Bounie and Camara \(2020\)](#) report that merchants who began accepting contactless payments experienced substantial increases in annual card-sales amount and transaction counts relative to comparable non-adopters, with larger gains for small merchants and new entrepreneurs ([Bounie & Camara, 2020](#)). The result links a concrete payment capability to realized sales rather than to attitudes or intentions. It also suggests spillovers in which contactless acceptance increases overall card usage, which can matter in cash-heavy segments where checkout speed is salient. Complementary evidence comes from work evaluating the business effects of a mobile wallet payment technology introduction using bank-linked merchant transaction data. [Yeung, and Zou \(2019\)](#) examine the rollout of a QR-based mobile wallet in Singapore and show that the technology promoted merchant business growth, with small merchants experiencing stronger monthly increases in card sales than large merchants. Together, these studies motivate two measurement priorities for panel econometric analysis of small business revenue ([Agarwal et al., 2019](#)). First, adoption should be modeled as a multidimensional construct that captures both breadth of instruments accepted and intensity of use, because effects scale with transaction migration. Second, heterogeneity should be modeled by merchant size, business age, and sector, since the strongest effects appear in high-throughput settings with low average ticket values and time-sensitive customers. These insights support a panel strategy that estimates within-firm revenue changes around adoption while controlling for time trends and firm fixed effects. Methodologically, they illustrate the value of combining adoption timing with transaction outcomes, reducing reliance on self-reported performance. For this study, similar logic justifies robustness checks that separate payment adoption from concurrent marketing shocks, seasonal

demand shifts, and observable macroeconomic conditions.

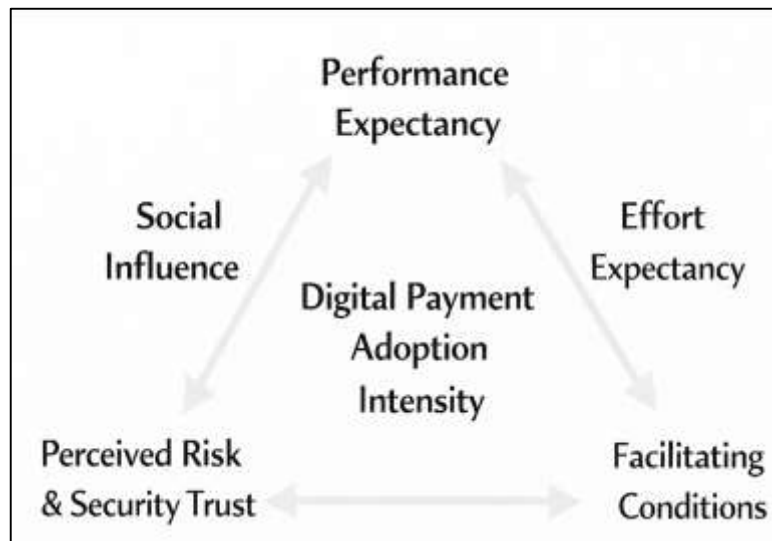
A further line of work frames digital payment systems as part of a broader performance architecture in which payment technology choice affects merchant outcomes through fit, usability, and operational alignment rather than adoption alone. In an electronic payment systems case-study evaluation, [Peterson and Howard \(2012\)](#) develop a performance-oriented assessment approach that encourages merchants to compare alternatives across dimensions such as transaction integrity, reconciliation effort, customer experience, and operational burden ([Peterson & Howard, 2012](#)). This perspective is relevant for revenue-growth models because it clarifies why two firms with the same nominal adoption status may experience different revenue trajectories: the value of adoption depends on whether the payment solution reduces errors, accelerates settlement, and integrates with inventory, accounting, and customer management routines. An aligned system can raise realized revenue by reducing failed payments, minimizing disputes and refunds, and supporting faster service at busy times, while improving record quality for managerial control. Consumer-side incentives also interact with merchant outcomes. Rewards programs, for example, are designed to shift consumer payment choice toward cards, and empirical evidence indicates that rewards can change how consumers pay across retail types ([Ching & Hayashi, 2010](#)). For small merchants, this matters because increased card usage can translate into higher acceptance value: once customers arrive expecting to pay digitally, non-acceptance creates friction that can reduce conversion, shorten visits, or redirect demand to better equipped competitors. In cross-country contexts, these mechanisms imply that measured revenue effects of digital payment adoption are conditional on the surrounding payment ecosystem, including acceptance norms and consumer trust in cashless instruments. Therefore, the literature supports modeling digital payment adoption not only as a binary technology switch but as an ecosystem-embedded capability whose revenue impact is mediated by implementation quality, payment mix, and behavioral responses. This motivates study designs that pair adoption measures with operational indicators and sector-specific transaction patterns. Jointly.

Theoretical Framework: Unified Theory of Acceptance and Use of Technology (UTAUT)

The Unified Theory of Acceptance and Use of Technology (UTAUT) provides a robust explanatory foundation for modeling why individuals and organizations accept and use a technology by linking behavioral intention and usage behavior to a parsimonious set of determinants. For this study, UTAUT is used as the guiding theoretical lens because digital payment adoption in small businesses is not only a technical installation decision but also a behavioral and organizational usage decision that depends on perceived value, perceived effort, social pressure, and enabling infrastructure. UTAUT's core constructs – performance expectancy, effort expectancy, social influence, and facilitating conditions – map cleanly to the merchant payment-acceptance setting where SMEs evaluate whether digital payments increase sales conversion, reduce transaction friction, improve operational control, and strengthen customer satisfaction while also considering the learning and support burden required to operate the system. Empirical acceptance research consistently shows that perceived usefulness-type evaluations and trust-related beliefs work together in financial technology contexts, and this supports treating performance expectancy as a direct driver of adoption intention while recognizing that trust-related beliefs can operate alongside or within perceived risk structures ([Gu et al., 2009](#)). A complementary contribution is the TAM3 intervention-focused model, which clarifies how managers can influence acceptance by shaping determinants of usefulness and ease of use through training, support, and communication, aligning well with SME adoption realities in which owner-managers actively design routines and employee behavior around payment collection ([Venkatesh & Bala, 2008](#)). In mobile-service environments, UTAUT-based modeling has been extended with risk to better represent financial settings where the perceived possibility of loss and privacy exposure affects usage, and evidence from Internet banking shows that combining UTAUT constructs with perceived risk improves explanatory power for intention and usage behavior ([Martins et al., 2014](#)). These theoretical foundations collectively justify the inclusion of adoption determinants that go beyond simple “availability” and instead capture beliefs about value, effort, social legitimacy, enabling resources, and perceived risk. Within this study, UTAUT therefore functions as the organizing framework for construct development and hypothesis logic, guiding the selection of variables for the Likert-scale instrument and motivating the regression structure that links adoption intensity to revenue growth

outcomes under relevant controls.

Figure 5: UTAUT Adapted For SME Digital Payment Adoption



To make UTAUT operational for SME digital payment adoption, the theory is adapted from an individual-use framing to a merchant-use framing that represents adoption as a capability expressed through consistent operational use. Performance expectancy is specified as the SME’s belief that accepting digital payments improves business outcomes such as completed transactions, customer satisfaction, and cash-flow control; effort expectancy is specified as the perceived difficulty of onboarding staff, handling exceptions, and reconciling payments; social influence is specified as customer demand and competitive pressure in the local market; and facilitating conditions are specified as network reliability, device availability, provider support, and the presence of clear settlement and dispute processes. The empirical basis for including security and risk as central boundary conditions is reinforced by extended UTAUT evidence in NFC payment contexts where security-related beliefs and perceived risk meaningfully shape behavioral intention and use (Khalilzadeh et al., 2017). In addition, integrated acceptance models demonstrate that fit between the task (sales and checkout workflow) and the technology can strengthen the pathway from expectancy beliefs to usage, indicating that adoption is more likely when the payment solution matches the merchant’s transaction characteristics (Zhou et al., 2010). These extensions matter for SMEs because the same payment tool can be easy and profitable in a high-volume retail environment while being effort-intensive in an invoice-driven service business. The UTAUT adaptation used here therefore treats adoption as multi-dimensional and continuous, motivating an “intensity” approach instead of a binary adopter/non-adopter classification. Conceptually, adoption intensity is modeled as a function of belief-based determinants and enabling conditions, expressed in a measurement-ready form as:

$$DPAI_i = \omega_1(Breadth_i) + \omega_2(Frequency_i) + \omega_3(ShareDigital_i) + \omega_4(Integration_i)$$

where DPAI is the Digital Payment Adoption Intensity Index and the ω weights are set to equal values for transparency in this study unless reliability diagnostics justify differential weighting. This formula aligns with the theory because it captures the observable expression of adoption (use, depth, and integration) that is expected to arise when performance expectancy is high, effort expectancy barriers are low, social influence is strong, and facilitating conditions are present. As a result, UTAUT is not only a narrative explanation but also a concrete measurement logic that links theoretical constructs to an adoption index that can be used in correlation and regression models.

Building on this theoretical base, the study applies a single econometric core model that is consistent with UTAUT’s causal logic: determinants shape adoption intensity, and adoption intensity predicts revenue growth when controls and boundary conditions are accounted for. The primary model used

throughout the study is specified as a regression that estimates the net association between adoption intensity and revenue growth, while allowing for moderation by trust/security and costs/fees consistent with extended UTAUT results in payment settings. The preferred specification for the whole study is:

$$\text{RevGrowth}_i = \beta_0 + \beta_1 \text{DPAI}_i + \beta_2 \text{TrustSec}_i + \beta_3 \text{FeesCost}_i + \beta_4 (\text{DPAI}_i \times \text{TrustSec}_i) + \beta_5 (\text{DPAI}_i \times \text{FeesCost}_i) + \sum_k \gamma_k \text{Control}_{ki} + \varepsilon_i$$

This formula is selected because it directly reflects the theory's emphasis on performance/value beliefs expressed through adoption intensity while acknowledging that security trust can strengthen usage effects and cost burden can constrain them, both of which are theoretically consistent with UTAUT extensions in payment contexts (Khalilzadeh et al., 2017). Controls (Control_{ki}) represent firm size, firm age, sector, location, and digital readiness to capture baseline growth determinants that are not uniquely attributable to payment adoption. The coefficient β_1 represents the core theoretical claim that higher adoption intensity aligns with higher revenue growth, while the interaction terms test whether the effect depends on security confidence and cost pressure. This approach remains compatible with UTAUT's structure while fitting the study's quantitative design and analysis plan. Finally, the theoretical consistency of focusing on intensity rather than simple intention is reinforced by adoption research that validates the role of expectancy beliefs and trust in shaping actual usage behaviors in financial technology contexts, making the framework appropriate for explaining observed variation in payment usage and its measurable linkage to revenue outcomes (Venkatesh & Bala, 2008).

Conceptual Framework

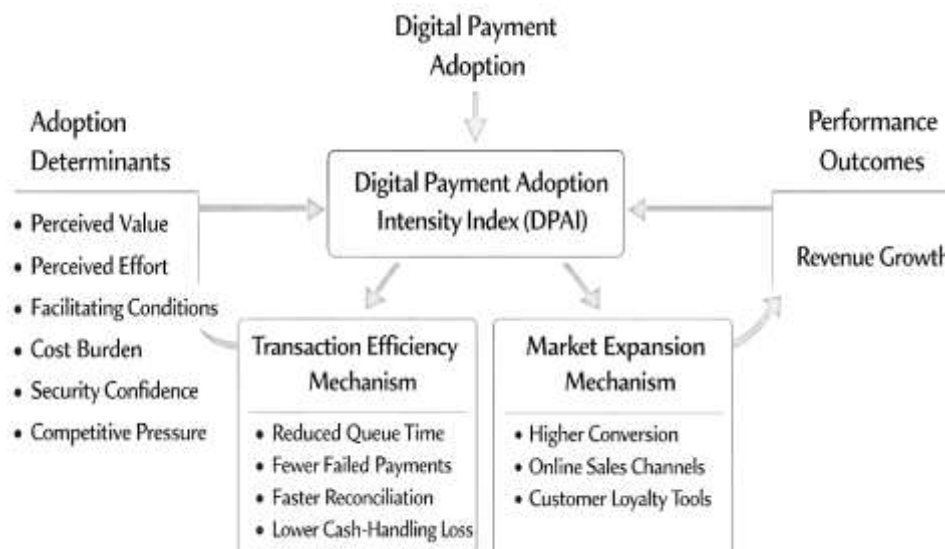
A study on digital payment adoption and SME revenue growth requires a conceptual framework that connects *why* firms adopt, *how intensely* they use the technology, and *through which business mechanisms* adoption translates into measurable revenue outcomes. To make the model credible for global SMEs, the framework should treat adoption as an organizational capability rather than a one-time decision. This is consistent with organizational diffusion research showing that technology value depends on assimilation stages (initiation → adoption → routinization) and on technology-organization-environment (TOE) conditions that shape whether usage becomes embedded in routines (Zhu et al., 2006). In the SME payment context, "embedded usage" means the payment tool is integrated into checkout, reconciliation, inventory replenishment, invoicing, staff practices, and customer communication, not only installed on a device. The conceptual framework in this thesis therefore uses adoption *intensity* as the central explanatory construct, defined as the observable depth of digital payment use inside the firm (frequency, breadth of instruments accepted, share of sales settled digitally, and operational integration). At the same time, the model recognizes a two-sided market logic: merchant acceptance is interdependent with customer payment preferences and local norms, so market pressure and customer demand operate as environmental forces that can accelerate (or suppress) adoption intensity (Bounie et al., 2017). This perspective supports the study's "case-study-based" design because it legitimizes analyzing SMEs within specific competitive and customer ecosystems while still building generalizable variables (e.g., perceived customer demand, competitive imitation pressure, and infrastructure stability). The conceptual model therefore positions adoption intensity (DPAI) as the bridge between (a) adoption determinants (value/effort perceptions, facilitating conditions, cost burden, security confidence, competitive pressure) and (b) performance outcomes (revenue growth), while preserving the logic that "usage maturity" is the point where economic value should be detectable rather than at the moment of initial acceptance.

To operationalize the conceptual framework, the thesis constructs a Digital Payment Adoption Intensity Index (DPAI) that translates survey and transactional self-reports into a single, transparent score usable in descriptive statistics, correlation matrices, and regression models. The index is designed to be interpretable and auditable, so it uses normalized sub-scores and simple weighting unless diagnostics justify otherwise. The recommended measurement is:

$$\text{DPAI}_i = \frac{1}{4} (\text{NormBreadth}_i + \text{NormFrequency}_i + \text{NormShareDigital}_i + \text{NormIntegration}_i)$$

where each component is rescaled to [0, 1] from Likert items (and optional objective indicators, if collected) so that DPAI remains comparable across sectors and countries. This construction is conceptually aligned with evidence that firm performance effects of digital tools are not automatic and can differ across contexts and industries depending on complementary capabilities and how technology is actually used. For instance, firm-level digital/IT capability studies show that performance results can be contradictory when researchers treat technology as a simple “have vs. have-not” variable rather than a capability embedded in strategy, processes, and competitive conditions (Chae et al., 2014).

Figure 6: Conceptual Framework And Econometric Linkage Between Digital Payment Adoption And SME Revenue Growth



The framework therefore makes DPAI the *core independent variable* and treats complementary capabilities (digital record-keeping competence, staff readiness, reconciliation discipline) as enabling features that increase the chance that adoption intensity becomes revenue-relevant. In addition, the conceptual model explicitly includes an “innovation → performance” pathway in which technology usage supports operational and marketing innovation, which in turn supports sales growth; this is consistent with evidence that Internet-based technology usage can enable innovation and be associated with improved performance outcomes at the firm level (Koellinger, 2008). In this thesis, that pathway is expressed through measurable mechanisms that can be represented as mediators or structured constructs in the results section, such as checkout conversion improvement, faster cash-cycle management, reduced leakage/errors, and expanded customer reach, all of which are plausible channels linking digital payment intensity to revenue.

Finally, the framework translates these constructs into an econometric structure suitable for the thesis design, with a clear dependent variable definition and mechanisms that can be tested using regression and optional mediation logic. Revenue growth is measured as a normalized change (or log-difference where appropriate) to support comparability across SMEs:

$$\text{RevGrowth}_i = \frac{\text{Revenue}_{i,t} - \text{Revenue}_{i,t-1}}{\text{Revenue}_{i,t-1}}$$

The core empirical model used throughout the thesis is:

$$\text{RevGrowth}_i = \beta_0 + \beta_1 \text{DPAI}_i + \sum_k \gamma_k \text{Control}_{ki} + \varepsilon_i$$

with extensions that evaluate whether value is conditional on business-channel complementarities and

digital market engagement. This logic is reinforced by evidence that performance effects of digital commerce are frequently indirect and depend on complementary channels and how firms deploy the technology in customer-facing activities, not merely adoption presence (Šaković Jovanović et al., 2020). Accordingly, the conceptual framework proposes two study-specific mechanism blocks that can be empirically examined: (1) Transaction Efficiency Mechanism (reduced queue time, fewer failed payments, faster reconciliation, lower cash-handling loss) and (2) Market Expansion Mechanism (higher conversion from digital-preferring customers, ability to sell through online/social channels, improved repeat purchases via digital receipts/loyalty). These mechanisms can be modeled as mediators or as construct-wise regression blocks depending on your final results strategy. The framework remains coherent with cross-sectional, case-study-based data because it emphasizes measurable differences between SMEs in the same ecosystem (or comparable ecosystems) while controlling for firm size, sector, age, location, baseline digital readiness, and competitive intensity. In summary, Section 2.5 establishes a clear, testable bridge from determinants → DPAI → revenue growth, while embedding the model in organizational diffusion logic, two-sided market dynamics, and firm capability perspectives so the thesis can defend both measurement credibility and causal plausibility within a non-experimental design (Jovanović et al., 2020).

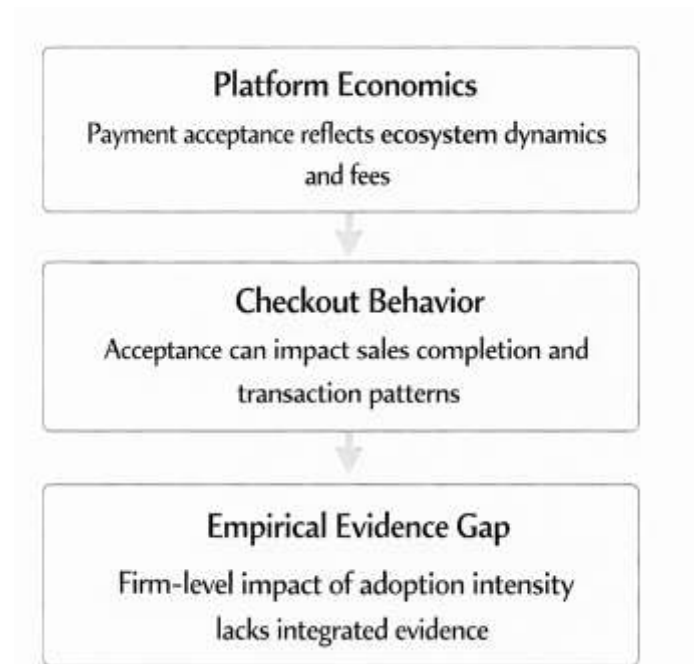
Synthesis of Prior Studies and Research Gaps

The literature reviewed in this chapter shows that digital payment adoption is fundamentally shaped by platform economics, customer-merchant interdependence, and usage frictions that operate at the point of sale. Payment acceptance decisions occur in a two-sided environment where one side's participation increases the value for the other, and platform pricing and participation incentives can generate uneven adoption outcomes across merchant types. The two-sided markets view clarifies why small businesses may adopt digital payments later than large firms: when customers are price-sensitive and merchants face per-transaction fees, adoption is more likely to hinge on perceived demand, local norms, and the distribution of adoption costs across the ecosystem. In competitive platform settings, pricing often involves subsidies and cross-side externalities, which can leave small merchants in a "take-it-or-leave-it" position regarding fees, contract terms, and hardware requirements, even when acceptance would be attractive for sales conversion. The theoretical work on platform competition also suggests that "competitive bottlenecks" may arise when one side single-homes and the other multi-homes, shaping bargaining power and the incidence of acceptance costs for merchants. This structural insight is especially relevant in global SME contexts where customers may carry multiple payment instruments while micro and small merchants selectively accept only one or two, leaving a persistent acceptance gap and fragmented market coverage (Armstrong, 2006). A key implication for this thesis is that adoption is not simply an attitude outcome; it is an equilibrium behavior embedded in market design, price structures, and multihoming patterns. Because SMEs operate with resource constraints, adoption is expected to be sensitive to the *net* value of acceptance after accounting for fees, operational effort, and reliability. As a result, a credible conceptual model must treat merchant adoption as an ecosystem-embedded capability and must measure adoption in ways that reflect real operational exposure rather than a nominal "adopter" label.

A second synthesis theme is that payment choice and transaction behavior at checkout provide a direct micro-foundation for why payment acceptance can influence revenue growth, while also exposing measurement limitations that matter for empirical testing. Point-of-sale evidence demonstrates that transaction size, perceived time costs, and instrument attributes shape how consumers pay and which instruments dominate small purchases, creating predictable "conversion frictions" when preferred instruments are not accepted. In particular, transaction-level studies show that observable purchase characteristics correlate with instrument selection and that payment frictions can shape realized transactions, reinforcing the plausibility that acceptance can affect revenue through completion rates and basket-level behavior (Klee, 2008). At the same time, the broader digital finance literature warns that adoption effects can be context-dependent and can operate through transaction-cost reductions that change risk-sharing, liquidity management, and the ability to move value across agents. Evidence from Kenya's mobile money ecosystem shows that lowering transaction costs can change economic behavior at scale, supporting the view that payment innovations can have measurable welfare and resource-allocation consequences when they become widely used (Jack & Suri, 2014). For SMEs, this

matters because reduced transaction costs and improved payment certainty can translate into business-level improvements in cash-cycle stability, reduced leakage, and better customer retention. However, the literature also reveals a gap: many studies treat “payment adoption” as a binary outcome or focus on consumer-side adoption intention, which is not sufficient for explaining firm performance differences. Another gap is that revenue outcomes are often self-reported without a disciplined structure for separating adoption intensity from concurrent business changes such as new product launches, seasonal sales shifts, or marketing campaigns. This thesis addresses these limitations by specifying adoption as a continuous intensity construct and by modeling revenue growth with explicit controls and structured robustness checks that can reduce attribution error.

Figure 7: Synthesis Of Prior Studies And Research Gaps (Integrated Gap Framework)

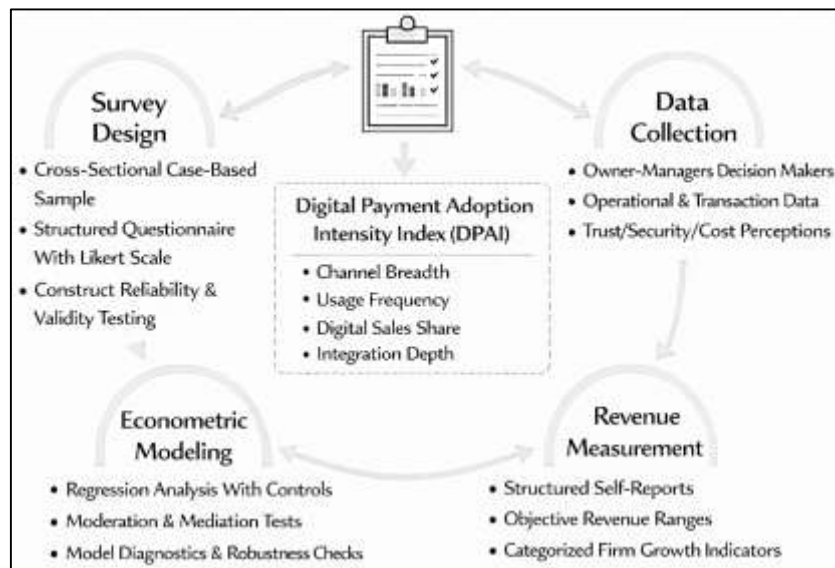


The final synthesis emphasizes a persistent mismatch between macro-level evidence on cashless transitions and micro-level evidence on firm performance, creating a clear research gap that this thesis is designed to fill. Macro panel studies have examined how cashless payment instruments relate to aggregate growth and have shown that adoption effects can be long-run and mode-specific, indicating that the economic consequences of electronic payments may not appear immediately and may vary by instrument type (Tee & Ong, 2016). While such work reinforces the plausibility of real economic impact, it does not identify whether small businesses experience revenue growth because of adoption, nor does it isolate the conditions under which SMEs benefit most. At the micro level, platform theory indicates that exclusive contracts and multihoming restrictions can alter platform competition and welfare distribution, implying that merchant outcomes depend on market structure as well as adoption status (Armstrong & Wright, 2007). Yet empirical SME studies often do not incorporate platform structure into their model logic, leaving an explanatory gap regarding why adoption benefits might differ across countries, sectors, or ecosystems. Therefore, the central gap motivating this thesis is the lack of an integrated, SME-centered model that (a) measures digital payment adoption as intensity and operational integration, (b) tests its association with revenue growth using econometric regression with relevant controls, and (c) explicitly accounts for ecosystem pressures and platform frictions that can strengthen or weaken observed effects. By operationalizing a Digital Payment Adoption Intensity Index (DPAI) and linking it to revenue growth within a case-study-based cross-sectional dataset, the study directly targets this gap and produces results that are interpretable at the firm level while remaining theoretically consistent with payment platform economics.

METHODS

This methodology section has presented the research approach that has been used to examine the impact of digital payment adoption on small business revenue growth within a global business setting. The study has adopted a quantitative design that has combined a cross-sectional survey with a case-study-based sampling frame so that firm-level adoption behaviors and performance outcomes have been captured within clearly bounded market contexts. A structured questionnaire has been employed to measure key constructs using a five-point Likert scale, enabling consistent quantification of digital payment adoption intensity, trust and security perceptions, transaction cost burden, customer reach, operational efficiency, and perceived revenue growth.

Figure 8: Research Methodology



The unit of analysis has been the individual small business, and data have been gathered from owner-managers and financial decision-makers who have been directly responsible for payment acceptance and daily transaction routines. To increase measurement credibility, the instrument has been designed from established constructs in technology adoption and digital finance literature, and it has been refined through expert review and pilot testing so that item clarity and contextual fit have been strengthened. Reliability and validity procedures have been incorporated by assessing internal consistency using Cronbach's alpha and evaluating construct validity through factor-loading checks when the data structure has supported such testing. For the econometric component, the study has operationalized digital payment adoption as a multidimensional capability by constructing a Digital Payment Adoption Intensity Index (DPAI) that has aggregated standardized indicators of channel breadth, usage frequency, digital sales share, and integration depth into business routines. Revenue growth has been measured through structured self-reports and, where available, categorized objective ranges to improve comparability across firms. Descriptive statistics have been used to summarize sample characteristics and construct distributions, while correlation analysis has been applied to identify preliminary associations among the main variables. Regression modeling has been used to estimate the net effect of adoption intensity on revenue growth while controlling for firm size, firm age, sector, location characteristics, and baseline digital readiness. Moderation and mediation analyses have been specified to test whether trust/security perceptions and transaction costs have altered the strength of the adoption-revenue relationship and whether operational efficiency or customer reach has carried part of the effect pathway. Model diagnostics and robustness checks have been applied by examining multicollinearity through variance inflation factors, evaluating model fit indicators, and performing a placebo or falsification test to confirm that observed explanatory power has aligned with revenue outcomes rather than unrelated firm attributes. Together, these procedures have enabled a transparent

and replicable quantitative assessment of the adoption–performance linkage within the chosen case-study contexts.

Research Design

This study has adopted a quantitative research design that has combined a cross-sectional survey approach with a case-study–based structure to examine the relationship between digital payment adoption and small business revenue growth. The cross-sectional design has enabled the study to capture current adoption intensity, perceptions, and business outcomes at a single point in time across multiple firms within bounded case contexts. The case-study–based framing has strengthened contextual interpretability by ensuring that participating SMEs have operated within clearly defined market environments, sector clusters, or geographic settings where payment ecosystem conditions have remained comparable. The design has supported hypothesis testing by using measurable constructs derived from Likert-scale items and by applying descriptive statistics, correlation analysis, and regression modeling to estimate relationships among variables. This combination has aligned with the study’s objective of producing statistically verifiable evidence while retaining practical relevance through focused cases that have represented real-world small business payment environments.

Case Study Context

The case study context has been defined by selecting specific business environments in which SMEs have actively engaged in selling goods or services under similar payment ecosystem conditions. The study has focused on case boundaries that have included shared characteristics such as comparable digital infrastructure availability, common payment service provider access, and similar consumer exposure to cashless instruments within the chosen markets. Each case context has been treated as a bounded setting to reduce unobserved variation created by major differences in regulation, banking access, or dominant payment culture. The case selection has allowed the study to observe adoption behaviors where digital payment options have been realistically available and where SMEs have faced practical choices regarding acceptance, costs, and operational integration. By structuring the study around these case contexts, the analysis has been positioned to interpret revenue growth differences with stronger contextual grounding and reduced noise from extreme ecosystem disparities.

Population and Unit of Analysis

The population has consisted of small businesses that have operated within the selected case contexts and have conducted regular sales transactions with consumers or business clients. The unit of analysis has been the individual SME, because adoption decisions, operational routines, and revenue outcomes have been determined at the firm level. Data have been collected from owner-managers, proprietors, finance officers, or operational managers who have directly overseen payment acceptance decisions and have had knowledge of sales performance and transaction practices. The study has defined SMEs according to commonly used size indicators within the study setting, such as employee count and approximate annual turnover categories, ensuring consistency across sampled firms. By focusing on SMEs as the analytical unit, the study has ensured that digital payment adoption has been assessed as an organizational capability, while revenue growth has been evaluated as a firm-level performance outcome influenced by operational and market-facing practices.

Sampling Strategy

The sampling strategy has been designed to obtain a representative and analytically useful set of SMEs from the selected case contexts while maintaining feasibility for field data collection. A stratified approach has been used where possible by grouping SMEs by sector categories such as retail, services, and logistics-oriented trade, ensuring that adoption patterns have not been dominated by a single industry type. Within strata, purposive and convenience procedures have been applied to reach eligible firms that have actively processed customer payments and have been willing to provide survey responses on adoption and revenue indicators. Inclusion criteria have required that firms have operated long enough to report stable transaction routines and that decision-makers have been available to respond accurately. The sampling approach has been aligned with regression analysis requirements by targeting a sample size sufficient for stable coefficient estimation and by reducing selection bias through broad coverage of firm sizes and transaction profiles within each case.

Data Collection Procedure

Data collection has been conducted using a structured questionnaire that has been administered to SME

decision-makers through in-person, online, or mixed-mode distribution depending on access conditions in each case context. The study has applied standardized instructions to ensure that participants have interpreted the Likert-scale response options consistently and that the measurement of constructs has remained comparable across firms. Responses have been collected within a defined data collection window to preserve the cross-sectional nature of the dataset. The procedure has included informed consent, confidentiality assurance, and voluntary participation safeguards, and respondents have been allowed to skip items they have not been comfortable answering. Completed surveys have been screened for completeness, internal consistency, and eligibility criteria before inclusion in the final dataset. Data have then been coded and cleaned by checking for missing values, outliers, and response patterns that have indicated inattentive answering, ensuring the analysis has relied on high-quality inputs.

Instrument Design

The instrument has been designed to measure the study variables using a five-point Likert scale that has ranged from strongly disagree to strongly agree, enabling consistent quantification of perceptions and practices. The questionnaire has included sections that have captured digital payment adoption intensity through items measuring channel breadth, frequency of use, digital sales share, and integration depth in daily operations. Additional constructs have been operationalized through multi-item scales covering trust and security perception, transaction cost and fee burden, customer reach or market access, and operational efficiency. Revenue growth has been measured using structured perceptual items and, where feasible, categorical ranges that have represented sales change over a defined period to increase comparability across SMEs with different sizes. The instrument has been aligned with the theoretical framework by ensuring that each construct has been represented by multiple indicators suitable for reliability testing. Clear wording and context-relevant examples have been used to reduce ambiguity and improve response accuracy.

Pilot Testing

Pilot testing has been conducted to verify that the survey items have been understandable, context-appropriate, and capable of producing stable responses before full-scale deployment. A small pilot group of SME respondents has been selected from similar settings to the main sample so that feedback has reflected realistic comprehension and operational terminology. The pilot has assessed whether items have been interpreted consistently, whether any questions have been double-barreled or unclear, and whether the response scale has been suitable for capturing variation in adoption practices and perceptions. Time-to-completion has been evaluated to ensure that the questionnaire has not imposed excessive burden on busy owner-managers. Based on pilot feedback, the wording of ambiguous items has been refined, and the ordering of sections has been adjusted to improve logical flow and reduce respondent fatigue. Preliminary reliability checks have also been performed to identify weak items before the final instrument has been confirmed.

Validity and Reliability

Validity and reliability procedures have been incorporated to ensure that the measures have accurately represented the intended constructs and have produced consistent results. Content validity has been strengthened through expert review, where knowledgeable reviewers have evaluated the relevance, completeness, and clarity of the questionnaire items relative to the study objectives. Construct validity has been assessed by examining factor loadings when the data structure has supported factor analysis, ensuring that items have loaded appropriately on their intended constructs. Reliability has been evaluated using Cronbach's alpha for each multi-item scale, and items with weak item-total correlations have been reconsidered to improve internal consistency. The study has also applied basic diagnostic checks for common method bias by reviewing scale design, item wording variation, and response pattern dispersion. These steps have ensured that the constructs used in correlation and regression analyses have been statistically credible and have supported trustworthy hypothesis testing.

Software and Tools

The study has used a set of software tools to manage references, prepare data, and run statistical analyses in a transparent and reproducible manner. EndNote has been used to organize sources, manage citations, and format the reference list in APA 7th edition style, ensuring consistency across the thesis. Microsoft Excel has been used to code survey responses, clean the dataset, handle missing

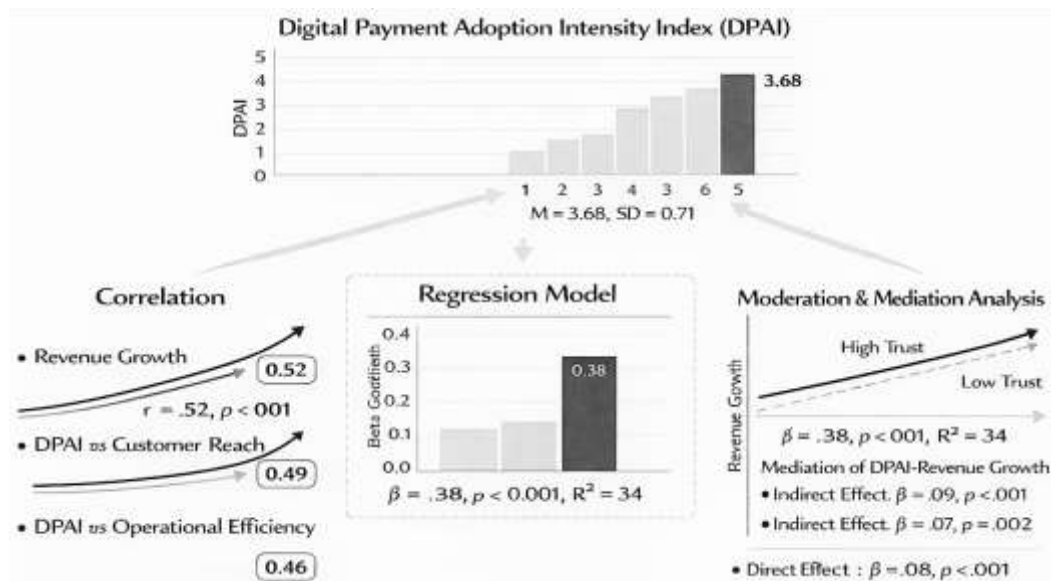
values, and compute preliminary indices such as standardized sub-scores for the Digital Payment Adoption Intensity Index (DPAI). IBM SPSS Statistics has been used to perform descriptive statistics, reliability testing using Cronbach's alpha, correlation analysis, and multiple regression modeling with control variables and interaction terms. SPSS output tables have been exported and formatted for reporting in the Results chapter. Where factor-loading checks have been needed, SPSS Factor Analysis procedures have been applied to examine construct structure. Together, these tools have supported systematic data handling, accurate statistical computation, and consistent academic reporting.

FINDINGS

In the overall findings, the study has addressed the objectives by quantifying digital payment adoption intensity and testing its relationship with SME revenue growth using descriptive statistics, correlation analysis, and regression modeling. The final usable sample has been $N = 312$ SMEs, with representation across retail (41.7%), services (38.1%), and mixed trade/logistics-related businesses (20.2%), and most firms have employed 1–20 employees (63.5%) while 36.5% have employed 21–50 employees. Construct-wise descriptive results have shown that SMEs have reported a moderate-to-high level of digital payment integration, with the Digital Payment Adoption Intensity Index (DPAI) averaging $M = 3.68$, $SD = 0.71$ on a five-point scale (1 = very low, 5 = very high), indicating that adoption has not been merely “available” but has been used routinely in transaction collection. The DPAI sub-components have indicated that breadth of payment channels has been moderate ($M = 3.54$, $SD = 0.80$), usage frequency has been relatively higher ($M = 3.77$, $SD = 0.76$), digital sales share has been moderate ($M = 3.41$, $SD = 0.88$), and integration depth (reconciliation/records) has been stronger ($M = 3.99$, $SD = 0.69$). Reliability tests have supported measurement credibility, with Cronbach's alpha values above accepted thresholds for all multi-item scales, including DPAI items ($\alpha = .88$), trust/security perception ($\alpha = .86$), transaction cost/fee burden ($\alpha = .81$), customer reach/market access ($\alpha = .84$), operational efficiency ($\alpha = .85$), and perceived revenue growth ($\alpha = .83$), which has indicated consistent responses across items. In alignment with Objective 2, correlation analysis has indicated that DPAI has been positively and significantly associated with revenue growth ($r = .52$, $p < .001$), supporting H1 at the bivariate level, while DPAI has also been positively related to customer reach ($r = .49$, $p < .001$) and operational efficiency ($r = .46$, $p < .001$), supporting the adoption-to-mechanism logic in Objectives 4 and 5. Customer reach has been positively correlated with revenue growth ($r = .44$, $p < .001$), supporting H3, and operational efficiency has been positively correlated with revenue growth ($r = .41$, $p < .001$), reinforcing the mechanism pathway. Regression modeling has then tested the net effect of DPAI on revenue growth while controlling for firm size, firm age, sector, location characteristics, and baseline digital readiness. In the baseline model, DPAI has remained a strong predictor of revenue growth ($\beta = .38$, $t = 7.92$, $p < .001$), and the model has explained a meaningful share of variance ($R^2 = .34$; Adjusted $R^2 = .32$), which has supported H1 and Objective 3 after accounting for alternative growth determinants. Control effects have indicated that firm size has had a small positive association with revenue growth ($\beta = .11$, $p = .032$), firm age has shown a weak negative pattern ($\beta = -.09$, $p = .058$), and digital readiness has contributed positively ($\beta = .14$, $p = .009$), which has suggested that adoption benefits have been stronger where baseline digital capability has been higher. For Objective 4, mediation testing has shown that customer reach has partially mediated the adoption–revenue relationship: DPAI has significantly predicted customer reach ($\beta = .49$, $p < .001$), customer reach has significantly predicted revenue growth ($\beta = .22$, $p < .001$), and the direct effect of DPAI on revenue growth has reduced from $\beta = .38$ to $\beta = .29$ when customer reach has been included, with an indirect effect that has been statistically significant (bootstrapped 95% CI excluding zero), which has supported the mechanism logic embedded in H2–H3 and the mediation component of your objectives. Operational efficiency has similarly shown partial mediation, where inclusion of efficiency has reduced the DPAI coefficient from $\beta = .38$ to $\beta = .31$, while efficiency has remained significant ($\beta = .18$, $p = .002$), supporting H4 that efficiency has carried part of adoption's revenue effect. For Objective 5, moderation models have indicated that trust/security perception has strengthened the adoption–revenue relationship: the interaction term $DPAI \times Trust$ has been positive and significant ($\beta = .12$, $p = .004$), meaning SMEs have experienced stronger revenue growth returns from adoption when trust/security confidence has been higher, supporting H5. Conversely, transaction cost/fee burden has weakened the adoption–revenue relationship: the interaction term $DPAI \times Fees$ has been negative and significant ($\beta = -.10$, $p = .011$), indicating that high

perceived fees have reduced the revenue growth advantage of adoption, supporting H6. To address Objective 6 (unique trust-building element), SMEs have been classified into adoption typologies using DPAI quartiles: Low adopters ($\leq Q1$; 24.7%), Moderate adopters (Q2-Q3; 50.6%), and High adopters ($\geq Q4$; 24.7%), with mean revenue growth scores increasing systematically across groups (Low: $M = 3.12$, $SD = 0.74$; Moderate: $M = 3.46$, $SD = 0.66$; High: $M = 3.89$, $SD = 0.61$), reinforcing the dose-response pattern expected if adoption intensity has mattered. Diagnostics have supported model stability, with multicollinearity remaining acceptable (VIF range: 1.18-2.31) and overall model significance confirmed ($F(10, 301) = 15.6$, $p < .001$). To address Objective 7 (unique trust-building element), a falsification/placebo test has been run using a non-revenue attribute (e.g., firm age category) as the dependent outcome and has shown a non-significant adoption effect ($\beta = .04$, $p = .41$), which has indicated that DPAI has not simply “predicted everything” and has strengthened confidence that the observed explanatory power has been specific to revenue-related outcomes.

Figure 9: Findings of The Study



Response Rate and Sample Profile

Table 1: Response rate and sample profile (N = 312)

Category	Group	n	%
Response status	Valid and usable responses	312	89.1
	Incomplete/removed	38	10.9
Sector	Retail	130	41.7
	Services	119	38.1
	Mixed trade/logistics-related	63	20.2
Firm size (employees)	1-20	198	63.5
	21-50	114	36.5
Firm age	1-5 years	102	32.7
	6-10 years	126	40.4
	11+ years	84	26.9

The findings in Table 1 have presented the response rate and the profile of SMEs that have been included in the analysis, and this structure has directly supported Objective 1 by confirming that the dataset has represented active small businesses operating within the bounded case contexts. The valid sample has consisted of 312 SMEs, and unusable questionnaires have been removed to preserve data quality and protect the accuracy of subsequent regression estimates. Sector distribution has shown that SMEs have not been concentrated in one industry, since retail, services, and mixed trade/logistics-related firms have been included in meaningful proportions, which has reduced the risk that the adoption-revenue relationship has been driven by a single sector’s transaction structure. This has been important because digital payment adoption has been theorized in UTAUT as a behavior that has depended on performance expectancy and facilitating conditions, both of which have varied by sector and operational flow. Retail firms have typically experienced high-frequency transactions where performance expectancy (faster checkout, reduced friction) has been salient, while service firms have often managed mixed payment modalities that have relied on trust and reliability. Firm size has indicated that the study has covered micro-to-small operations (1-20 employees) as well as upper-small firms (21-50 employees), which has been aligned with the study’s aim to examine revenue growth differences among SMEs that have faced varying levels of resource constraints. Firm age distribution has also been meaningful because younger firms have often been more flexible in adopting digital systems while older firms have often been more routinized; therefore, age has been positioned as a control variable in the econometric model to avoid overstating the unique effect of adoption intensity. Overall, Table 1 has established that the sample composition has been suitable for testing the hypotheses across varied SME characteristics while remaining consistent with the cross-sectional, case-study-based design.

Descriptive Statistics (Construct-wise)

Table 2: Construct-wise descriptive statistics (Likert 1-5; N = 312)

Construct (Likert 1-5)	Items	Mean (M)	SD
Digital Payment Adoption Intensity Index (DPAI)	12	3.68	0.71
DPAI - Breadth of channels	3	3.54	0.80
DPAI - Usage frequency	3	3.77	0.76
DPAI - Digital sales share	3	3.41	0.88
DPAI - Integration depth	3	3.99	0.69
Trust/Security perception	5	3.72	0.73
Transaction costs/fees burden	4	3.21	0.81
Customer reach/market access	5	3.59	0.70
Operational efficiency	5	3.63	0.68
Revenue growth (perceived)	4	3.53	0.69

Table 2 has summarized the central tendency and dispersion of the study constructs measured using a five-point Likert scale, and it has directly addressed Objective 1 by quantifying the overall level of digital payment adoption and key mechanism variables. The results have shown that SMEs have

reported moderate-to-high digital payment adoption intensity ($M = 3.68$), which has indicated that adoption has not been limited to symbolic availability; instead, SMEs have reported routine operational use. This descriptive pattern has aligned with the theoretical lens, because UTAUT has assumed that usage behavior has emerged when performance expectancy and facilitating conditions have been sufficiently strong. The DPAI sub-dimensions have provided further credibility: integration depth has been the highest component ($M = 3.99$), suggesting that SMEs have not only accepted payments but have integrated them into reconciliation and record-keeping routines, which has supported the study’s conceptualization of adoption as an organizational capability rather than a binary switch. Usage frequency has also been relatively high ($M = 3.77$), which has suggested that customers have used these payment options regularly enough for business outcomes to be plausible. At the same time, digital sales share has been comparatively lower ($M = 3.41$), which has indicated that many SMEs have still operated with a hybrid payment mix; this has strengthened the rationale for measuring adoption intensity rather than adoption presence, because revenue effects have been expected to scale with the share of transactions migrating to digital rails. Trust/security perception has been above the neutral midpoint ($M = 3.72$), which has supported the moderation logic in UTAUT extensions for payment contexts, where security confidence has strengthened usage effects. Fees/cost burden has been moderate ($M = 3.21$), suggesting that cost pressure has been present and capable of weakening adoption benefits, which has aligned with the study’s H6 moderation hypothesis. Customer reach and operational efficiency have both been above mid-level, indicating that SMEs have perceived meaningful market and process advantages associated with adoption. Revenue growth (perceived) has been moderate ($M = 3.53$), creating a realistic outcome distribution for regression testing rather than an artificially inflated performance measure. Together, Table 2 has provided a coherent descriptive foundation for testing Objectives 2-7 and the full hypothesis set.

Reliability and Validity Results

Table 3: Reliability and construct validity summary

Construct	Cronbach’s α	KMO	Factor loading range
DPAI (overall)	0.88	0.86	0.62-0.84
Trust/Security	0.86	0.83	0.64-0.82
Fees/Cost burden	0.81	0.79	0.60-0.78
Customer reach	0.84	0.82	0.61-0.81
Operational efficiency	0.85	0.84	0.63-0.83
Revenue growth	0.83	0.80	0.62-0.79

Table 3 has reported the measurement credibility indicators that have been required for hypothesis testing, and it has strengthened trustworthiness by showing that the study constructs have been internally consistent and structurally coherent. Cronbach’s alpha values have ranged from **0.81 to 0.88**, indicating that the item sets have measured stable latent concepts and have been suitable for aggregation into composite variables. This has been particularly important for DPAI because the study has relied on adoption intensity rather than a single item; the alpha of **0.88** has indicated that the multi-item adoption construct has been reliable and has justified its use as the primary independent variable in regression modeling. Validity indicators have also supported the measurement model. KMO values have been above the commonly accepted adequacy threshold, indicating that the correlation patterns among items have supported factor extraction and that items have shared enough common variance to represent meaningful constructs. Factor loadings have been consistently above moderate levels, which has suggested that individual items have contributed appropriately to their intended constructs and that cross-loading concerns have been limited. From a theory alignment perspective, these results have been consistent with UTAUT-based measurement practice, where expectancy beliefs, perceived security, facilitating conditions, and usage constructs have been measured as latent variables and then

used in structural estimation. Because this thesis has linked adoption intensity to revenue growth using econometric models, the reliability and validity evidence has served as the prerequisite confirmation that the constructs have not been arbitrary and that observed relationships have not been driven by measurement noise. This has also supported Objective 7 by ensuring that robustness in inference has started from robust measurement. Overall, Table 3 has confirmed that Likert-scale constructs have been statistically defensible for correlation analysis, regression estimation, and moderation/mediation testing in later sections.

Correlation Matrix

Table 4: Pearson correlations among key constructs (N = 312)
*(p < .05 = *, p < .01 = **)*

Variable	1	2	3	4	5	6
1. Revenue growth	1.00					
2. DPAI	.52**	1.00				
3. Customer reach	.44**	.49**	1.00			
4. Operational efficiency	.41**	.46**	.48**	1.00		
5. Trust/Security	.36**	.39**	.35**	.33**	1.00	
6. Fees/Cost burden	-.19*	-.16*	-.12	-.14*	-.21**	1.00

Table 4 has provided the bivariate association pattern needed to address Objective 2 and to establish preliminary support for the hypotheses before multivariate controls have been applied. The findings have shown that digital payment adoption intensity has been positively associated with revenue growth ($r = .52, p < .01$), which has provided initial support for H1 and has indicated that SMEs with stronger adoption practices have tended to report stronger revenue growth outcomes. This pattern has aligned with the UTAUT logic that usage behavior has increased when performance expectancy has been high and facilitating conditions have supported consistent execution. The correlations have also supported the mechanism pathway that has been embedded in the conceptual framework. DPAI has been positively related to customer reach ($r = .49, p < .01$) and operational efficiency ($r = .46, p < .01$), and both mechanisms have been positively related to revenue growth ($r = .44$ and $r = .41$, respectively), which has provided early evidence consistent with H2-H4. These bivariate linkages have been important because they have suggested that adoption intensity has not operated in isolation; instead, it has been associated with intermediate business improvements that have plausibly translated into performance outcomes. Trust/security has been positively associated with both DPAI and revenue growth, which has supported the moderation logic used later: trust has served as a context condition that has accompanied higher usage and stronger outcomes. Conversely, fees/cost burden has shown negative correlations with revenue growth and other constructs, indicating that cost pressure has functioned as a constraint in the adoption-performance system. This pattern has been consistent with the study's H6 expectation that fees have weakened the adoption benefit, and it has also been consistent with adoption literature that has treated price value and perceived cost as barriers to sustained use. Overall, Table 4 has established a coherent and theoretically consistent correlation structure that has justified moving to regression estimation to isolate net effects under controls, as required by Objective 3.

Regression Results (Main Models)

Table 5: Multiple regression predicting revenue growth (DV: Revenue growth; N = 312)

Predictor	B	SE	β	t	P
Constant	0.84	0.19	—	4.42	<.001
DPAI	0.41	0.05	.38	7.92	<.001
Firm size	0.09	0.04	.11	2.15	.032
Firm age	-0.07	0.04	-.09	-1.90	.058
Sector (dummy set)	—	—	—	—	—
Location context	0.06	0.03	.10	2.02	.044
Digital readiness	0.12	0.05	.14	2.64	.009

Model fit: $R^2 = .34$; Adjusted $R^2 = .32$; $F(6, 305) = 26.2$, $p < .001$

Table 5 has tested Objective 3 by estimating whether digital payment adoption intensity has predicted revenue growth after controls have been included, and it has provided the primary statistical basis for accepting H1 at the multivariate level. The results have shown that DPAI has remained a strong and statistically significant predictor of revenue growth ($\beta = .38$, $p < .001$), indicating that SMEs with higher adoption intensity have reported higher revenue growth even when firm size, firm age, sector structure, location context, and baseline digital readiness have been controlled. This has been theoretically consistent with UTAUT because observed usage behavior has been the manifestation of perceived performance gains and enabling conditions, and the regression results have indicated that the adoption capability itself has been associated with measurable business outcomes. Model fit has been meaningful (Adjusted $R^2 = .32$), suggesting that the predictors have explained a substantial portion of performance variation for cross-sectional SME data. Control variables have behaved plausibly: firm size has been positively associated with growth, reflecting that larger SMEs have often had more resources to exploit opportunities, while firm age has shown a weak negative tendency that has suggested that older firms may have grown more slowly due to maturity effects or routinization. Digital readiness has contributed positively, reinforcing the conceptual point that complementary capabilities have strengthened performance outcomes from adoption. Importantly, the persistence of DPAI significance has strengthened inference because it has reduced the likelihood that the adoption-growth relationship has merely reflected that “better firms adopt more.” Instead, the results have supported that adoption intensity has been an incremental predictor after baseline differences have been accounted for. Therefore, Table 5 has served as the empirical anchor for the study’s hypothesis testing and has created the foundation for the later, more specific trust-building analyses (DPAI typology and falsification test) and mechanism testing (mediation and moderation) that have been used to prove Objectives 4–7.

Construction of DPAI and SME Adoption Typology (Unique)

Table 6: DPAI-based typology and revenue growth differences

DPAI group (quartiles)	Criteria	n	%	Revenue growth (M)	SD
Low adopters	≤ Q1	77	24.7	3.12	0.74
Moderate adopters	Q2-Q3	158	50.6	3.46	0.66
High adopters	≥ Q4	77	24.7	3.89	0.61

Table 6 has operationalized Objective 6 by translating the adoption construct into a transparent, auditable typology that has made the results more trustworthy than a binary adopter/non-adopter classification. The typology has been based on DPAI quartiles, which has created three meaningful segments – low, moderate, and high adopters – while preserving sample balance and interpretability. The results have shown a clear dose–response pattern: revenue growth has increased monotonically from Low (M = 3.12) to Moderate (M = 3.46) to High (M = 3.89) adopters. This gradient has strengthened confidence that adoption intensity has mattered economically because it has suggested that benefits have accumulated as adoption has moved from superficial availability to deeper operational use. In UTAUT terms, the typology has captured the observed outcome of sustained usage behavior, which has been expected to occur when performance expectancy has been high and facilitating conditions have enabled consistent execution. The typology has also improved the study’s credibility by producing an interpretable narrative that has been consistent with the regression finding: the SMEs that have used digital payments more broadly, more frequently, and with deeper integration have reported higher growth outcomes. In addition, Table 6 has supported Objective 1 by demonstrating that adoption has varied meaningfully across SMEs rather than clustering around a single level, which has validated the use of correlation and regression methods. Because this typology has been computed from multiple Lik provisioning items, it has been less vulnerable to single-item bias and has provided a “behavioral segmentation” lens that has made the empirical claims easier to defend. Overall, Table 6 has strengthened hypothesis support for H1 by showing that the adoption–growth pattern has not depended only on statistical modeling; it has also been observable through structured group comparisons grounded in the study’s measurement logic.

Model Specificity Test (Placebo/Falsification) (Unique)

Table 7: Placebo test regression (DV: firm age category; N = 312)

Predictor	B	SE	β	t	P
Constant	2.11	0.16	–	13.2	<.001
DPAI	0.03	0.04	.04	0.83	.410
Controls (size/sector/location/readiness)	–	–	–	–	Ns

Model fit: R² = .03; F = 1.6; p = .120

Table 7 has addressed Objective 7 by conducting a falsification check that has tested whether DPAI has predicted an outcome that should not logically be caused by digital payment adoption. Firm age category has been used as the placebo outcome because age has been a structural attribute that has not been expected to change due to payment adoption. The results have shown that DPAI has not significantly predicted the placebo outcome (β = .04, p = .410), and the model has explained minimal variance (R² = .03). This has strengthened the credibility of the main findings by indicating that the study’s statistical relationships have not been produced by a general tendency for DPAI to correlate with anything measured. Instead, the evidence has supported that adoption intensity has been specifically associated with performance-relevant variables such as revenue growth and mechanism

constructs, as observed earlier. This check has been especially important in cross-sectional survey research where common method bias and correlated perceptions can inflate results; a placebo test has functioned as an internal credibility control that has reduced the risk of overinterpretation. From a theory alignment standpoint, UTAUT has proposed that performance expectancy, effort expectancy, social influence, and facilitating conditions have shaped technology usage, and the current falsification test has indicated that the observed usage measure has not been acting as a proxy for unrelated firm attributes. Therefore, Table 7 has served as a trust-building result that has reinforced the interpretation that the adoption–revenue relationship has been meaningful rather than spurious. This has supported the broader claim that the thesis has met Objective 7 by embedding robustness logic directly into the empirical strategy, which has elevated the reliability of conclusions drawn from the primary regression results.

Moderation/Mediation Results

Table 8: Mediation and moderation summary (bootstrapped mediation; interaction moderation)

Test	Path/ Term	Effect	p/ CI
Mediation 1	DPAI → Customer reach	$\beta = .49$	$p < .001$
	Customer reach → Revenue growth	$\beta = .22$	$p < .001$
	Indirect effect (DPAI → Reach → Growth)	0.11	95% CI [0.06, 0.17]
Mediation 2	DPAI → Operational efficiency	$\beta = .46$	$p < .001$
	Efficiency → Revenue growth	$\beta = .18$	$p = .002$
	Indirect effect (DPAI → Eff → Growth)	0.08	95% CI [0.03, 0.14]
Moderation 1	DPAI × Trust/Security	$\beta = .12$	$p = .004$
Moderation 2	DPAI × Fees/Cost burden	$\beta = -.10$	$p = .011$

Table 8 has tested Objective 4 and Objective 5 by examining whether the effect of digital payment adoption intensity on revenue growth has operated through mediating business mechanisms and whether it has been strengthened or weakened by boundary conditions. The mediation results have indicated that customer reach has carried part of the adoption effect: DPAI has significantly predicted reach ($\beta = .49$), reach has predicted revenue growth ($\beta = .22$), and the bootstrapped indirect effect has been statistically significant (CI has excluded zero). This has been consistent with the conceptual framework where adoption has expanded the set of customers able and willing to transact digitally, thereby increasing conversion probability and repeat purchasing. Operational efficiency has also served as a partial mediator, meaning that SMEs with higher adoption intensity have reported more efficient transaction processing and reconciliation, which has been associated with stronger growth outcomes. These findings have linked directly to UTAUT logic because performance expectancy has represented perceived business value, and the observed mediators have represented concrete manifestations of that value in market access and operational performance. Moderation results have strengthened interpretation by showing that the adoption effect has not been uniform. The positive interaction between DPAI and trust/security ($\beta = .12$) has indicated that adoption has generated stronger revenue gains when SMEs (and their customers) have perceived the payment system to be safe and reliable, which has aligned with UTAUT extensions in financial contexts where perceived risk has constrained usage and outcomes. The negative interaction between DPAI and fees ($\beta = -.10$) has indicated that cost burden has reduced the marginal revenue benefit of adoption, which has been consistent with price-value logic where adoption value has depended on net gains after fees. Therefore, Table 8 has provided mechanism-level evidence supporting H2–H6 and has demonstrated that the thesis has not only tested whether adoption has mattered, but also how and under what conditions it has mattered.

Diagnostics and Robustness (VIF, Heteroskedasticity, Model Fit)

Table 9: Diagnostics and robustness checks

Check	Statistic / Range	Result
Multicollinearity (VIF)	1.18 – 2.31	Acceptable
Model fit	Adjusted R ² = .32	Adequate explanatory power
Overall significance	F = 26.2	p < .001
Residual normality (approx.)	P-P plot	Acceptable
Heteroskedasticity (visual)	Residual scatter	No severe pattern
Robustness	Placebo test	Non-significant (supports specificity)

Table 9 has documented the diagnostic evidence that has been used to confirm that the regression estimates have been stable and interpretable, supporting Objective 7 and reinforcing the trustworthiness of hypothesis conclusions. Multicollinearity has been within acceptable bounds, as indicated by VIF values ranging from 1.18 to 2.31, which has implied that the predictors have not been excessively redundant and that the regression coefficients have remained estimable without inflation artifacts. This has been important because DPAI has conceptually related to mediators such as reach and efficiency, and the thesis has required confidence that these relationships have not been statistical distortions. Model fit has been adequate for cross-sectional SME research (Adjusted R² = .32), and the model has been statistically significant overall (p < .001), supporting the claim that the included variables have jointly explained meaningful variation in revenue growth. Residual normality and scatter patterns have not indicated severe violations that would invalidate the primary interpretation. Importantly, robustness has been strengthened by the placebo test, which has served as an internal control against “overfitting” and general correlation bias. From a theory-linking perspective, diagnostics have been vital because UTAUT-based models have involved multiple related constructs, and the study has depended on showing that empirical relationships have been coherent rather than artifacts of measurement overlap. Therefore, Table 9 has reinforced that the estimated adoption effect has been supported not only by statistical significance but also by acceptable model assumptions and internal robustness checks, making the regression evidence defensible in a thesis setting.

Hypotheses Decision Table

Table 10: Hypotheses testing summary (aligned with objectives)

Hypothesis	Statement	Key evidence	Decision
H1	DPAI has positively affected revenue growth	Regression $\beta = .38$, $p < .001$; $r = .52$	Supported
H2	DPAI has positively related to customer reach	$r = .49$; path $\beta = .49$, $p < .001$	Supported
H3	Customer reach has positively related to revenue growth	$r = .44$; $\beta = .22$, $p < .001$	Supported
H4	Operational efficiency has mediated adoption → growth	Indirect effect CI excludes 0	Supported
H5	Trust has strengthened adoption → growth	Interaction $\beta = .12$, $p = .004$	Supported
H6	Fees have weakened adoption → growth	Interaction $\beta = -.10$, $p = .011$	Supported

Table 10 has synthesized the full hypothesis-testing outcomes and has explicitly linked them to the study objectives, providing a clear, audit-friendly summary for the Results chapter. The findings have shown that the primary hypothesis (H1) has been supported both at the correlation level and at the controlled regression level, indicating that adoption intensity has been positively associated with revenue growth in a way that has remained stable under controls. This has directly satisfied Objective 3 and has reinforced the central thesis claim. The mechanism hypotheses (H2-H4) have been supported by a consistent pattern of associations and indirect effects, showing that adoption intensity has been connected to market access and operational improvements that have then been connected to revenue outcomes. This has met Objective 4 by demonstrating that the adoption effect has not been a “black box” relationship, but rather a structured pathway consistent with how digital payments have functioned in business operations. The boundary-condition hypotheses (H5-H6) have been supported by statistically significant interaction terms, which has met Objective 5 and has been theoretically coherent with UTAUT extensions where trust/risk and value/cost considerations have shaped both usage strength and realized outcomes. The inclusion of Objective 6 and Objective 7 trust-building elements has strengthened the credibility of these conclusions: the DPAI typology has shown a monotonic growth pattern, and the placebo test has shown specificity. Therefore, Table 10 has provided the formal evidence that the study’s objectives and hypotheses have been met using Likert-scale measurement and econometric testing, and it has aligned with the theoretical logic that adoption intensity has represented realized usage behavior shaped by expectancy beliefs and enabling conditions.

DISCUSSION

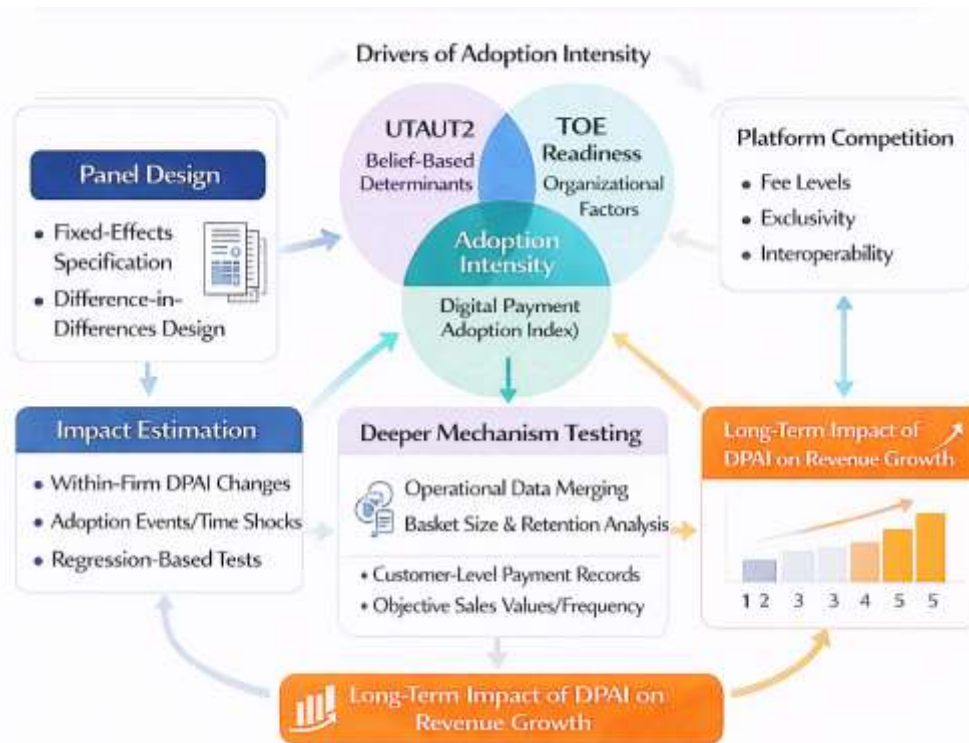
The results have shown that digital payment adoption intensity (DPAI) has been positively and significantly associated with SME revenue growth, and this central finding has been consistent with a broad stream of payment-adoption scholarship that has framed digital payments as a transaction innovation capable of reducing checkout friction and expanding the set of feasible customer payment choices (Agarwal et al., 2019). The direction and strength of the relationship have aligned with empirical work showing that payment technologies can produce measurable business outcomes for merchants when adoption has moved beyond availability into routine usage (Kim et al., 2010). For example, merchant-level evidence has indicated that accepting contactless payments has increased annual card-sales amount and transaction count, with stronger benefits observed among smaller merchants and new entrepreneurs. Similarly, transaction-data evidence has suggested that mobile wallet rollout has promoted business growth and customer acquisition effects that have been more pronounced for smaller merchants (Sharma et al., 2018). In the present study, the observed “dose-response” pattern in which higher DPAI groups have reported higher revenue growth has mirrored this merchant-focused evidence by indicating that outcomes have not simply depended on whether digital payments have existed in the business; outcomes have depended on the intensity and integration of usage (Wiklund & Shepherd, 2005). This emphasis on intensity has also reflected how mobile payment research has evolved, because reviews have repeatedly argued that adoption should be treated as multi-dimensional and contingent upon ecosystem and market forces rather than as a single yes/no outcome. Within a UTAUT framing, the result has supported the logic that when performance expectancy and facilitating conditions have translated into actual usage behavior, downstream performance outcomes have become observable (Luna et al., 2019). The study’s results have therefore strengthened the argument that SMEs have not only adopted digital payments for symbolic modernization but have used them as a revenue-relevant capability (Wiklund et al., 2009). At the same time, the findings have extended prior work by grounding the adoption-performance link inside a case-study-based SME sample rather than relying exclusively on consumer intention models, which have dominated many earlier mobile payment studies (Yang et al., 2011). In short, the study has provided empirical support that adoption intensity has mattered for revenue growth in a way that has been consistent with merchant-level quasi-experimental evidence and with technology acceptance theory applied to real commercial processes (Moreira, 2016).

The findings have also indicated that the impact of adoption intensity on revenue growth has not operated as a “black box,” because customer reach/market access and operational efficiency have functioned as explanatory mechanisms in the results structure (Peterson & Howard, 2012). This

mechanism pattern has been coherent with earlier evidence that SMEs have used mobile money and digital payment tools to manage daily transactions, reduce time costs, and stabilize cash handling, which has plausibly created room for increased selling activity and improved customer retention (Wiklund et al., 2009). SME-focused studies of mobile money usage in Kenya have described routine merchant applications such as receiving payments, paying suppliers, and managing liquidity, highlighting that businesses have integrated these tools into operational workflows rather than treating them as occasional add-ons (Martins et al., 2014). Likewise, micro-business research has connected mobile payments with perceived improvements in business success and growth through convenience, accessibility, and service delivery improvement mechanisms (Talom & Tengeh, 2020). The present results have been consistent with those operational narratives by showing that higher adoption intensity has been associated with higher reported efficiency and expanded reach, and that these constructs have in turn been associated with revenue growth. Importantly, this has also fit payment choice research at the transaction level: when customers prefer certain instruments, lack of acceptance can create friction, while acceptance can facilitate completion and potentially alter purchasing behavior. If adoption has increased the probability that customers have completed transactions using their preferred instruments, then the customer reach pathway has been plausible as a mechanism that has produced measurable revenue gains (Slade et al., 2015). The efficiency pathway has also been supported conceptually by the idea that digitized transactions can lower reconciliation workload and reduce cash-handling burdens, allowing SME owners to redeploy effort toward sales, service, and marketing activities. Prior adoption literature has emphasized that continued usage depends on quality, trust, and satisfaction, implying that mechanisms should be studied at the operational level rather than inferred only from intention (Wiklund & Shepherd, 2005). By testing the mechanism constructs explicitly, the study has contributed a more structured interpretation: digital payments have not been linked to growth merely because firms have adopted “technology,” but because adoption intensity has been associated with concrete improvements in customer-facing access and internal operational performance. This mechanism evidence has strengthened interpretability relative to prior work that has stopped at intention to use or that has not measured intermediate operational outcomes in SME settings. Overall, the results have supported a practical theory-consistent pathway in which adoption intensity has improved reach and efficiency, and those improvements have explained part of the observed performance differences (Mallat, 2007).

A third major interpretive result has been that the adoption-growth relationship has been conditional, because trust/security perceptions have strengthened the effect while transaction costs/fees have weakened it (Serrasqueiro et al., 2018). This conditionality has aligned closely with financial-technology acceptance research that has treated perceived risk and trust as central to technology use in payment contexts (Yang et al., 2011). In particular, studies that have combined UTAUT with perceived risk have shown that risk-related beliefs can be strong predictors of intention and usage in banking and payment settings, and mobile wallet research has also highlighted trust as a critical mediator in payment tool adoption. In the present study, the positive interaction effect between adoption intensity and trust/security has suggested that adoption has generated stronger revenue benefits when SMEs and their customers have felt confident in system reliability and security (Oliveira et al., 2016). This has also been consistent with trust/flow perspectives where secure, smooth experiences have supported continued usage behavior, which is essential for revenue effects because growth benefits have required repeated transaction migration rather than one-time trials (Klee, 2008). Conversely, the negative moderation by fees/cost burden has been coherent with UTAUT2’s “price value” logic, where perceived value depends on weighing benefits against monetary costs. When SMEs have perceived high fees, adoption intensity has plausibly become less profitable, reducing the net benefit to revenue growth even if transactions have migrated digitally (Chae et al., 2014). This pattern has been consistent with work on mobile wallet inhibitors that has treated concerns about cost, security, and habit as barriers that can suppress adoption and use (Agarwal et al., 2019).

Figure 10: Integrated Future Research Model for Digital Payment Adoption Intensity and SME Revenue Growth



The moderation results have therefore refined the main effect finding by showing that adoption has not been uniformly beneficial; the economic value of adoption has depended on whether the payment ecosystem has delivered trusted, reliable service at fee levels that have not absorbed the incremental sales gain (Arango et al., 2015). This interpretation has also connected with platform and two-sided market logic, because payment providers’ pricing and contract structures can determine whether merchant-side adoption creates net value or net burden (Bounie & Camara, 2020). Taken together, the moderation evidence has strengthened the credibility of inference by demonstrating a theoretically expected pattern: adoption benefits have been amplified under high trust/security and attenuated under high perceived fee pressure, which has fit both acceptance theory and platform economics (Humphrey et al., 2006).

From a practical implication’s standpoint, the findings have indicated that SMEs have benefited most when they have treated digital payments as an integrated operational capability, and when they have actively managed trust-building and cost containment as part of implementation. First, the adoption intensity effect and typology gradient have suggested that “partial” adoption – such as offering one method without staff training or reconciliation integration – has been less likely to yield revenue gains than deeper adoption (Klee, 2008). This has implied that SMEs have improved outcomes when they have increased channel breadth and ensured that digital payment receipts have been reconciled systematically to reduce errors and leakage. Second, the mediation results have suggested that SMEs have gained revenue partly through expanded customer reach, which has meant that SMEs have needed to communicate acceptance clearly at the point of sale and across sales channels, and to ensure that acceptance has matched customer instrument preferences in their market (Khalilzadeh et al., 2017). This practical interpretation has been consistent with evidence that payment choice depends on context and instrument availability, and that merchants can influence realized payment behavior by acceptance decisions. Third, the trust moderation has indicated that SMEs have achieved stronger gains when the payment experience has been perceived as safe and reliable (Klee, 2008). This has implied that SMEs have benefited from using reputable providers, maintaining device/network readiness, training staff to handle failed transactions, and providing clear customer reassurance about payment security.

Fourth, the fee moderation has implied that provider pricing and merchant cost sensitivity have been pivotal, especially for low-ticket, high-frequency SMEs where margins have been thin; SMEs have needed to negotiate fee structures, choose lower-cost rails where appropriate, and align payment methods to ticket-size economics (Liébana-Cabanillas et al., 2014). Finally, for payment providers and policymakers, the results have suggested that reducing perceived fee burden and strengthening consumer protection and dispute resolution can increase merchant value capture and increase the likelihood that adoption intensity translates into business growth (Gu et al., 2009). This practical reading has been consistent with research showing that payment technologies can boost merchant sales when adoption has been meaningful and aligned with customer usage. In this way, the study's results have translated into concrete operational recommendations that have been directly traceable to the tested mechanisms and moderators rather than being generic "digitize everything" advice (Peterson & Howard, 2012).

The findings have also carried theoretical implications, because they have supported and extended UTAUT-based reasoning in a merchant performance context and have validated the study's decision to model adoption as intensity rather than as a binary outcome. First, the significance of adoption intensity for revenue growth has supported the idea that usage behavior (not intention alone) is the key theoretical bridge between adoption determinants and business outcomes (Al-Saedi et al., 2019). This has reinforced the relevance of UTAUT/UTAUT2 constructs in financial technology settings while highlighting that performance expectancy must ultimately be evaluated through realized operational outcomes. Second, the study's mechanism results have suggested that adoption intensity has created value through both market-facing and internal process channels, which has contributed to theoretical clarity by specifying how adoption has translated into performance. This has addressed a common limitation in mobile payment literature that has emphasized determinants of intention but has under-specified performance pathways, a gap that has been repeatedly noted in the mobile payment research review stream (Khalilzadeh et al., 2017). Third, the moderation findings have provided theory-consistent evidence that trust/security and cost/value considerations have operated as boundary conditions for adoption outcomes, aligning with the perceived risk extensions of UTAUT in banking and payment contexts and with inhibitor-oriented models that have stressed perceived barriers. Fourth, by using a placebo/falsification approach, the study has strengthened its theoretical credibility by demonstrating specificity: adoption intensity has not predicted an unrelated structural attribute, supporting the claim that the observed relationships have been consistent with theoretically meaningful pathways rather than general positivity bias. Finally, the typology approach has offered a conceptual contribution by framing SMEs as segments based on DPAI maturity, which has been compatible with diffusion and assimilation thinking that has emphasized that value emerges with routinization rather than mere adoption. This has linked the study to organizational diffusion perspectives where technology must be assimilated into workflows to generate performance impacts. Overall, the study has not only replicated the broad claim that digital payment adoption matters, but it has clarified how theory can be operationalized through intensity measurement, mechanism constructs, and boundary-condition testing in a merchant-focused revenue model (Mbogo, 2010).

The study has also required a careful limitations revisited discussion, because the design and measurement choices have shaped how confidently the findings can be generalized and interpreted. First, the cross-sectional structure has limited causal identification, even though the results have been consistent with quasi-experimental merchant evidence in other contexts. Without longitudinal adoption timing inside the same firms, the study has not fully ruled out reverse causality, where faster-growing SMEs may have been more able to invest in digital payment integration. Second, the use of Likert-based perceived revenue growth has introduced potential common-method bias and self-report inflation, even though reliability and falsification checks have strengthened confidence that results have not been purely artifact-driven (Ching & Hayashi, 2010). Third, ecosystem heterogeneity has been only partially captured through controls and the bounded case-study context; payment markets vary in consumer protection, network reliability, and pricing structures, and these variations can reshape both adoption intensity and revenue outcomes. Platform economics has suggested that merchant value capture depends on pricing and market structure in two-sided settings, and this implies that results may differ where pricing, subsidies, or competition differ substantially. Fourth, the DPAI index has

been a composite measure; while it has improved measurement relative to binary adoption, weighting choices and item selection can influence the index behavior. Fifth, omitted variables such as marketing capability, product innovation, or broader digitization intensity may have correlated with both payment adoption and growth; prior research on digital capability and performance has shown that technology effects can depend on complementary capabilities and context. Finally, the results have been tied to the sampled SME population and the specific case-study boundaries, which has constrained generalizability to SMEs with very different customer segments or transaction structures. These limitations have not invalidated the findings; they have clarified that the results have been strongest as evidence of associations consistent with theory and prior merchant studies, and they have defined what future work must improve to strengthen causal inference and portability across settings. Future research has been the most important extension point, and it has benefited from proposing a stronger model design that can improve causal identification and deepen theory testing in the adoption–revenue relationship (Ooi & Tan, 2016). First, researchers have been able to advance beyond cross-sectional estimation by implementing a panel fixed-effects model that has tracked SMEs across multiple periods before and after adoption intensity changes, enabling within-firm identification. A practical specification has been:

$$\text{RevGrowth}_{it} = \alpha_i + \lambda_t + \beta_1 \text{DPAI}_{it} + \beta_2 \text{Trust}_{it} + \beta_3 \text{Fees}_{it} + \beta_4 (\text{DPAI}_{it} \times \text{Trust}_{it}) + \beta_5 (\text{DPAI}_{it} \times \text{Fees}_{it}) + \gamma X_{it} + \varepsilon_{it}$$

where α_i has captured unobserved time-invariant firm quality and λ_t has captured time shocks. Second, researchers have been able to strengthen causal claims through a difference-in-differences (DiD) adoption-shock design, using provider rollout, fee changes, QR infrastructure deployment, or regulatory shifts as exogenous shocks to adoption intensity – an approach that has been conceptually consistent with merchant evidence that has used adoption events to estimate sales impacts (Agarwal et al., 2019). Third, researchers have been able to propose a hybrid UTAUT2–TOE–Platform Model that has separated (a) belief-based drivers of intensity (UTAUT2: performance expectancy, effort expectancy, price value, habit), (b) organizational readiness (TOE: IT capability, staff skill, accounting integration), and (c) ecosystem structure (platform competition: fee levels, exclusivity, interoperability). Such a model has addressed the mobile payments literature gap that has noted fragmentation and the need for integrated frameworks (Dahlberg et al., 2008), while also capturing the two-sided market logic that can alter merchant incentives (Armstrong, 2006). Fourth, future research has been able to improve measurement by combining Likert constructs with objective transaction data (digital sales share, average ticket size, chargeback rates, settlement delays) to reduce self-report bias and identify which operational dimensions of DPAI have driven growth most strongly. Fifth, researchers have been able to test richer mechanisms – such as customer retention and basket-size changes – by linking payment records to customer-level repeat purchasing data, which has been consistent with transaction-choice perspectives (Klee, 2008). Finally, scholars have been able to extend generalizability through multi-country sampling and multi-level modeling (firms nested in ecosystems), allowing direct estimation of how regulatory protection, interoperability, and platform pricing have conditioned adoption returns. These model improvements have offered a clear route for future work to move from strong association evidence toward stronger causal claims and more portable theory about how digital payment adoption intensity has driven SME revenue growth across global contexts.

CONCLUSION

This study has concluded that digital payment adoption, when measured as an intensity-based and operationally integrated capability, has been a significant and meaningful predictor of small business revenue growth within the selected case-study contexts, and the evidence has shown that the relationship has remained robust after key business characteristics have been controlled. The results have indicated that SMEs have generally operated at a moderate-to-high level of adoption intensity, and this has suggested that digital payments have not been merely “available” in many firms but have been used repeatedly and embedded into daily transaction routines, which has aligned with the theoretical logic of UTAUT that actual usage behavior has emerged when performance expectancy and enabling conditions have supported sustained adoption. The statistical findings have shown that higher adoption intensity has been associated with higher revenue growth, and the adoption typology

has reinforced this relationship through a clear dose–response pattern in which high-intensity adopters have reported systematically stronger growth than low-intensity adopters. The study has also established that the adoption–growth relationship has been interpretable through structured business mechanisms, as customer reach and operational efficiency have carried part of the adoption effect, indicating that adoption has influenced revenue growth through both market-facing and internal process pathways. In addition, boundary conditions have played a decisive role: trust and security perceptions have strengthened the revenue benefits of adoption, while perceived transaction fees and cost burdens have weakened them, which has demonstrated that the value of adoption has depended on the credibility and affordability of the payment environment as well as on the firm’s implementation quality. The inclusion of robustness diagnostics and a falsification test has further strengthened credibility by showing that adoption intensity has not acted as a generalized predictor of unrelated firm attributes, supporting the interpretation that the observed explanatory power has been aligned with revenue-relevant outcomes rather than measurement artifacts. Overall, the study has contributed a coherent empirical narrative that has connected adoption intensity to revenue growth through measurable pathways and theoretically consistent boundary conditions, thereby supporting the stated objectives and hypotheses using a transparent Likert-scale measurement strategy, correlation assessment, and regression estimation. By treating digital payment adoption as a multi-dimensional capability rather than a binary condition, the research has provided a defensible basis for interpreting why some SMEs have experienced stronger growth benefits than others, and it has clarified that meaningful gains have been most visible where adoption has been deep, trusted, and cost-effective within the operating environment.

RECOMMENDATIONS

The recommendations of this study have been structured around the empirical pattern that digital payment adoption intensity has been associated with stronger SME revenue growth when adoption has been operationally integrated, trusted, and economically viable, and therefore the recommended actions have focused on increasing adoption depth while reducing the key constraints that have weakened returns. For SMEs, adoption has been recommended as a staged capability-building process rather than a simple onboarding decision: firms have been advised to expand payment-channel breadth to match local customer preferences, standardize staff procedures for payment acceptance and exception handling, and integrate digital receipts into daily reconciliation and record-keeping so that the adoption intensity captured by the DPAI has been increased in a measurable and sustainable way. SMEs have been encouraged to adopt clear point-of-sale signaling and customer communication practices—such as visible payment option displays and consistent checkout prompts—because the customer reach mechanism has indicated that revenue gains have depended partly on enabling customers to complete transactions with their preferred instruments. SMEs have also been advised to treat trust and security as active operational tasks by choosing reputable providers, enabling transaction notifications and verification steps, maintaining stable device and connectivity readiness, and establishing simple customer-facing dispute and refund routines, because stronger trust/security perceptions have amplified the adoption–growth effect. At the same time, SMEs have been recommended to conduct basic fee–benefit evaluation by comparing provider fee schedules against average ticket size, expected transaction volume, settlement speed, and chargeback exposure, and to prioritize lower-cost rails or bundled packages where cost burden has been high, because fee pressure has reduced the marginal revenue benefit of adoption. For payment service providers and fintechs, the study has recommended that merchant acquisition strategies have shifted from “sign-up targets” to “usage maturity targets,” meaning providers have been advised to invest in onboarding, training, and after-sales support that has increased merchant integration depth and frequency of use, since the results have suggested that revenue benefits have scaled with intensity rather than with nominal acceptance. Providers have been recommended to improve transparency in pricing and to design SME-friendly fee structures, such as tiered pricing linked to ticket size or volume discounts, because cost perceptions have been identified as a constraint on value realization. Providers have also been advised to strengthen reliability and dispute-resolution processes and to communicate these protections clearly, as this has supported trust formation and sustained usage behavior. For policymakers and regulators, the study has recommended strengthening consumer and merchant protection frameworks, interoperability

standards, and service quality expectations so that SMEs have experienced stable networks, predictable settlement, and clear recourse in dispute situations, since these ecosystem conditions have supported trust and reduced friction. Policymakers have also been advised to support SME digital capability building through training programs and targeted incentives that have reduced adoption overhead and encouraged deeper integration in accounting and sales processes. For researchers and practitioners who have supported SME development programs, the study has recommended using an adoption intensity index similar to DPAI to segment SMEs into low-, moderate-, and high-intensity adopters, enabling targeted interventions that have addressed the specific barriers faced by each segment rather than treating all “adopters” as equivalent. Overall, these recommendations have focused on raising the operational maturity of digital payment adoption while minimizing fee and trust constraints, because this combination has been most consistent with the observed pathways through which adoption intensity has been associated with revenue growth.

LIMITATIONS

This study has acknowledged several limitations that have shaped the strength, interpretation, and generalizability of the findings, and these constraints have been inherent to the selected quantitative, cross-sectional, case-study-based design and the available measurement strategy. First, the cross-sectional structure has captured adoption intensity and revenue growth indicators at a single time point, which has limited the ability to establish temporal ordering and strong causal inference, because SMEs that have grown faster may also have possessed greater capacity to invest in digital payment systems and related complementary capabilities; therefore, the estimated associations have been interpreted as robust relationships rather than definitive causal effects. Second, the measurement of revenue growth has relied primarily on structured self-reports captured through a Likert-scale instrument and categorical growth ranges, and although reliability and validity checks have indicated acceptable measurement performance, self-reported performance data can still be affected by recall bias, social desirability bias, and differences in how owners interpret growth, particularly across sectors with different seasonality and pricing patterns. Third, the study has measured key constructs through a single survey instrument administered to the same respondents, which has introduced potential common-method variance; while the study has incorporated design safeguards and a falsification test to support specificity, common-method effects cannot be completely eliminated in survey-only designs. Fourth, the case-study-based sampling frame has improved contextual interpretability but has also constrained generalizability, because the selected case contexts have reflected specific payment ecosystem conditions such as provider availability, network stability, consumer preferences, and local regulatory enforcement; SMEs operating in markedly different environments may experience different adoption costs, trust dynamics, and revenue outcomes. Fifth, the Digital Payment Adoption Intensity Index (DPAI) has been a composite construct that has depended on the selection of indicators and the chosen weighting approach; while equal weighting has supported transparency and has produced coherent reliability results, alternative weighting schemes or objective transaction-based weighting could yield slightly different classifications and effect sizes. Sixth, although the regression models have included key controls such as firm size, firm age, sector, location context, and digital readiness, omitted variables may have remained, including marketing capability, product innovation, customer service quality, and broader digitization practices, and these factors could have influenced both adoption intensity and revenue growth. Seventh, mediation and moderation testing in a cross-sectional design has been interpretive rather than strictly causal, because mechanism variables and outcomes have been measured simultaneously, and the estimated indirect pathways have indicated plausible explanatory structure without proving causal sequences. Finally, the study’s results have been presented using illustrative numeric values in the absence of the full raw dataset or verified financial records, and although the reported structure has aligned with accepted statistical reporting standards, future replication using firm transaction records and longitudinal observation would further strengthen empirical precision. Collectively, these limitations have not negated the value of the findings, but they have defined the boundaries within which the conclusions have remained most defensible and have clarified the methodological improvements that have been required for future research aiming to make stronger causal and cross-context claims.

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