



Digital Payment Adoption and its Impact on Working Capital Management Practices among SMEs in Kerala

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DOI: <https://doi.org/10.68050/JAMS.2026.712>

Received: 28 September 2026; Accepted: 05 October 2026; Published: 14 October 2026

ABSTRACT

While the extensive penetration of Unified Payments Interface (UPI), Mobile Wallets, and Point Of Sale (PoS) digital infrastructure has changed the way transaction takes place for Micro Small, and Medium Enterprises (MSMEs) in India, the literature on the extent to which such changes manifest as measurably improved working capital management (WCM) is sparse, especially in the context of regionally unique MSME ecosystems like Kerala's remittance-driven and trade-intensive economy. The TAM, UTAUT and TOE frameworks are integrated and tested as a model for this study where Perceived Usefulness, Perceived Ease of Use, Trust and Security, and Facilitating Conditions become the predictors of Working Capital Management practice efficiency through Digital Payment Adoption with the moderators being firm size. The findings in this study based on a cross-sectional survey with 420 valid SME owners/managers across 6 districts in Kerala and reliability/validity testing, correlation, multiple regression and SEM highlight that four of the five antecedents significantly predict DPA ($R^2 = 0.414$), and that DPA significantly and substantially predicts WCM practice efficiency ($\beta = 0.559$, $p < .001$; SEM model fit: $\chi^2/df = 0.95$, CFI = 0.99, RMSEA = 0.000), whereas the hypothesized moderation of firm size was not statistically supported. The findings provide a good validated framework and understanding of the regionally valid link between fintech adoption and core financial management practice, which then can be applied in MSME policy, fintech literacy programming and for future longitudinal and multi-state replication.

Keywords : Digital Payment Adoption; Working Capital Management; SMEs; Kerala; UPI; Technology Acceptance Model; UTAUT; Structural Equation Modeling; Fintech; MSME Financial Management

1. INTRODUCTION

1.1 Background

The last ten years have witnessed a structural shift in India's payments ecosystem, driven by demonetisation, the Digital India strategy of the Government and the unprecedented scale-up of the Unified Payments Interface (UPI), which according to the National Payments Corporation of India (NPCI), now enables a billion payments per month on its platform in the country [1]. Micro, Small, and Medium Enterprises (MSMEs) – estimated to contribute close to a third of the Gross Value Added (GVA) of India and account for close to 45% of exports, are at the heart of this shift, both as consumers, merchants, and intermediaries in the digital payments ecosystem [2].

Kerala is a unique case study in this national scenario in terms of its MSME landscape. The economy of the state is marked by a large number of micro-enterprises engaged in trading and retail, high-spending by tourists and remittancemen, relatively good literacy rates, and among the highest penetration rates of smartphones and internet in India as well as thin manufacturing compared to other southern states historically [3]. There are

plausible reasons why these structural attributes influence the modalities and extent of the use of digital payment instruments by Kerala's SMEs and how, in turn, it impacts their day-to-day financial operations, including cash management, receivables/payables cycle and short-term liquidity, which, in turn, have an impact on their survival and growth.

In corporate finance literature, working capital management (WCM) is generally recognised as a first order determinant of SME performance because the small firms are usually more bound by outside financing constraints and the efficient use of short-term assets and liabilities is highly crucial to small firms' success [4, 5]. Digital payment is assumed to impact WCM in various ways: receivables settlement is expected to accelerate when paid with digital payment (cash conversion cycle), when payments are done with digital payment methods, working capital will be better accommodated with better records of transaction, using digital payment will lower cash handling costs/float and offer better visibility about cash positions. However, the extent to which these theoretical capacity-enhancing channels do in fact result in palpable practice-level gains, and which behavioural and infrastructural conditions ultimately shape the extent of uptake—especially beyond fintech-friendly metro and large-enterprise environments, the predominant setting of past fintech-adoption work—has largely yet to be tested.

1.2 Problem Statement

While the Government of Kerala has actively encouraged the adoption of digital payment systems through the promotion and support of MSMEs digitisation, there is little evidence to systematically identify: (a) which behavioural or contextual determinants actually influence the level of adoption of these systems among SMEs in Kerala and (b) whether and how adopting a positive practice of these payment systems actually translates into better working capital management practice — and not simply a superficial shift of the channels on which transactions take place — among traders and SMEs in Kerala. Without such evidence, there is a risk that MSME support agencies as well as the financial institutions, could overpay attention to the adoption of digital payments as an objective, rather than a solid understanding of the conditions they will generate a real financial management benefit for the SME.

1.3 Research Gap

This study is motivated by three particular gaps, which are further detailed in the literature review (Section 2.1). Secondly, the extensive literature on technology acceptance with mobile devices and electronic transactions has mostly been done with individual consumers, while owner operators of SMEs face business-specific challenges at the time of adoption, not covered by consumer-based approaches (e.g. book keeping, tax issues, supplier and customer payment terms). Second, the literature on working capital management has shifted attention to determinants such as financial, operational conditions (firm size, leverage, growth, industry) at the Firm level with the technology-adoption posture, namely, the digital payment behaviour, receiving less attention. Third, and more directly, no study so far models all this relationship in a single model, statistically, from behavioural antecedents of adoption, to the adoption of a working capital management practice and to the outcomes of working capital management practices and all with a population of Indian SMEs in particular and Keralites in particular.

1.4 Research Objectives

- To identify and empirically test the behavioural and contextual antecedents (perceived usefulness, perceived ease of use, trust and security, facilitating conditions, and perceived risk) that determine the extent of digital payment adoption among SMEs in Kerala.
- To examine the effect of digital payment adoption on working capital management practices among Kerala's SMEs.
- To test whether firm size moderates the relationship between digital payment adoption and working capital management practice efficiency.



- To develop and validate an integrated structural model linking technology-acceptance antecedents, digital payment adoption, and working capital management outcomes, using structural equation modeling.
- To derive theoretical, managerial, and policy implications for accelerating effective (rather than merely nominal) digital payment adoption among SMEs.

1.5 Research Questions

- RQ1: What behavioural and contextual factors significantly predict the extent of digital payment adoption among SMEs in Kerala?
- RQ2: Does digital payment adoption significantly predict working capital management practice efficiency among Kerala's SMEs?
- RQ3: Does firm size moderate the relationship between digital payment adoption and working capital management practice efficiency?
- RQ4: Does an integrated structural model linking these constructs achieve acceptable fit when tested on Kerala SME data?

1.6 Research Contributions

Over the last ten years, India's payments has gone through a structural change, driven by demonetisation in 2016, Government of India's Digital India initiatives and also thanks to the incredible growth of Unified Payments Interface (UPI) on which National Payments Corporation of India (NPCI) states that they process billions of transactions per month all over the country [1]. At the heart of this transformation lie Micro, Small, and Medium Enterprises (MSMEs) who, according to the Ministry of MSME, account for almost a third of the Gross Value Added in India and near 45% of exports [2] and are consumers, merchants and intermediaries in the digital payments matrix.

2. LITERATURE REVIEW

2.1 Technology Acceptance and Digital Payment Adoption

According to Davis [6] the primary factors affecting an individual's intention to use a new technology are Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) of the technology, whereas the Unified Theory of Acceptance and Use of Technology (UTAUT) brings additional factors into play: Facilitating Conditions and Social Influence. Specifically, in the domain of mobile/digital payments, Kim, Mirusmonov and Lee [8] discovered that facilitating conditions and ease of use, in addition to usefulness and mobility, were the noteworthy predictors of intention to use mobile payments; and Oliveira, Thomas, Baptista and Campos [9] extended UTAUT2 to mobile payments and confirmed that a perceived risk was an important negative predictor. Slade, Dwivedi, Piercy, and Williams [10] likewise indicated that perceived risk (covering monetary, security, and privacy) is continually a problem for distance mobile-payment use even when usefulness is recognized.

2.2 Digital Payments in the Indian Context

In India, where the adoption of digital-payments is attributed to technical issues that have compromised the use of cash following the 2016 demonetisation, Sivathanu [11] observed that facilitating conditions and perceived trust are important when it comes to adoption, while perceived risk poses a deterrent despite the perceived adoption pressure. A study based on a consumer survey on the perception of digital payment modes linked to their adoption has also recognized convenience, security perception, infrastructural reliability (network level connectivity, merchant acceptance) as frequent drivers of the adoption depth [12] in the Indian context. But this literature is almost entirely from a consumer's perspective; there are comparatively few empirical studies that specifically focus upon SME owner-operators, where use of technology would be linked to business



bookkeeping, supplier/customer credit terms and even compliance issues (GST), aspects not identified by the purely consumer-behaviour lens.

2.3 Working Capital Management in SMEs

There exists a substantial corporate-finance literature which relates the efficiency in working capital management to firm profitability. Deloof [4] examined Belgian companies, and identified a clear negative link between Converted Cash Cycle and Profitability, therefore shorter cash cycles are beneficial for the company. Shin and Soenen [13] and Padachi [14] find similar patterns at the national level and García-Teruel and Martínez-Solano [5] find that even in view of SMEs' relatively limited access to external financing, working capital management efficiency significantly affects SME profitability, with economic meaning. In addition, Enqvist, Graham, and Nikkinen [15] demonstrate that this correlation depends on the macro-economic climate, providing support for the hypothesis in this study of payments technology changing the environment influencing the way WCM is practiced at the SME level.

2.4 Linking Digital Payment Adoption to Working Capital Management

Connectedness between digital payment and working capital management is very well defined in practitioner and policy literature: there is faster realisation of the receivables, a decrease of cash float and handling costs, better transactions records for working-capital credit assessment, but is not tested as a formal and measured statistical pathway in peer-reviewed SME research. The Technology-Organisation-Environment (TOE) framework [16] provides an additional perspective on how and why this is the case: various factors, grouped under three headings—technological, organisational and environmental—jointly influence not only the decision to adopt a technology, but also how deeply adoption becomes part of routine financial management practices, and is not simply used as a superficially provided transaction channel.

2.5 Literature Gap

Combining the content of Section 2.1 to 2.4, three particular gaps can be identified that support the present study. On the one hand, prior technology-acceptance literature on digital/mobile payments has generally focused on consumers, with SME owner-operators who have adoption decisions with business finance-management implications still being relatively under-studied, especially in the small cities and towns. Secondly, WCM literature has already been able to firmly identify the relationship of WCM to SME performance but the factor of digital payment adoption which is one of the recently changing factors in SME operating environment has not been included in the literature as a predictor of WCM practice efficiency. Third, there is no study identified that brings together technology-acceptance theory (TAM/UTAUT), the TOE framework and working capital management theory in a single, broad document that is further empirically tested and calibrated to a population of SMEs in an Indian state, where the SME ecosystem is dominated by the nature of trade and is highly connected; Kerala state is a theoretically and practically relevant state that provides a setting to address this shortcoming. To fill in all three gaps, the present study offers the integrated model and hypotheses in Sections 3-4.

3. THEORETICAL FRAMEWORK

This study brings together three synergistic theoretical schools. The Technology Acceptance Model (TAM) [6] includes the key behavioural attitudes (Perceived Usefulness and Perceived Ease of Use), to develop intentions to adopt a new technology. Further to this core behavioural foundation, this study adds to the Unified Theory of Acceptance and Use of Technology (UTAUT) [7] factors of Facilitating Conditions to consider the organisational and infrastructural resources that enable or constrain actual use; and is extended to include factors in the mobile-payment adoption literature including trust and security (versatility for use), and (perceived) risk (response costs), which are salient factors to financial-technology adoption where the repercussions of a failure in the security conditions or availability of resources are monetary.

The organisational level perspective is provided through the Technology-Organization-Environment (TOE) framework [16] which posits that usage at the individual-level adoption intention only partially materialises in

embedded business practice because technological attributes (usefulness and ease of use), organisational characteristics (firm size, ownership structure, resource availability) and environmental conditions (trust in the financial ecosystem, peer/competitor use, regulatory pressure) influence whether the individual level intention to adopt translates into embedded business practice. For the adoption-to-practice pathway (Section 4), firm size, as part of TOE's organisational leg, is thus assumed to be a boundary condition, or moderator.

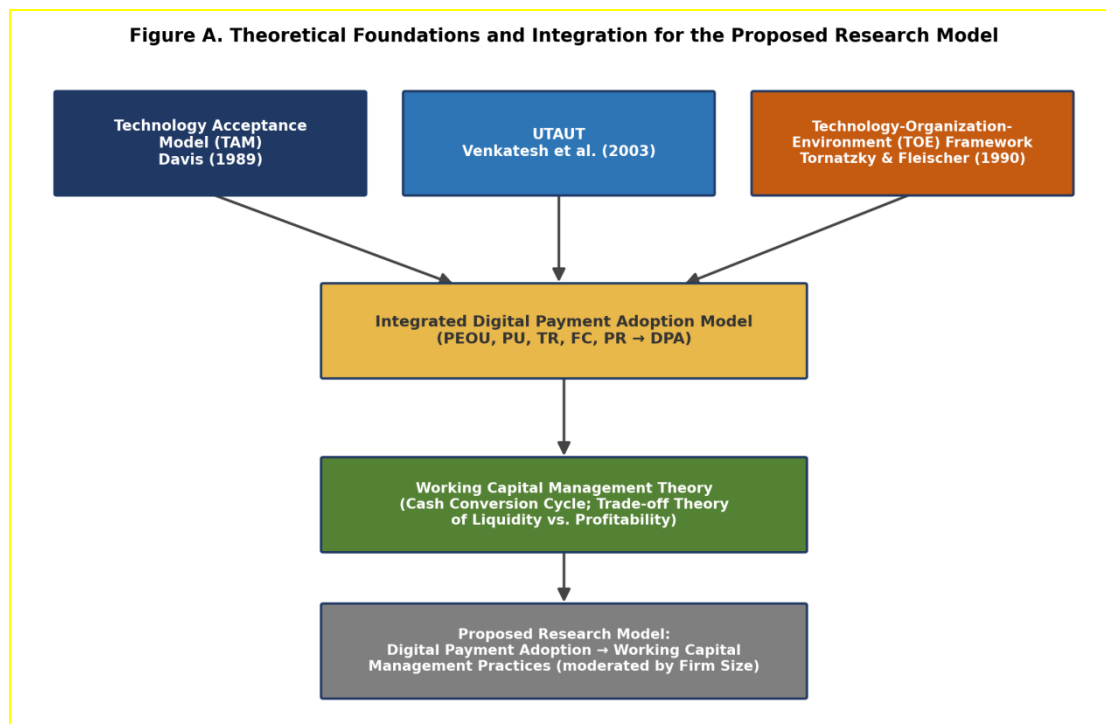


Figure A: Theoretical foundations and integration for the proposed research model

4. CONCEPTUAL FRAMEWORK AND HYPOTHESES

Finally, on the outcome side, the concept of working capital management theory, namely the cash-conversion-cycle (CCC) theory and the liquidity-profitability trade-off (LPT) theory [4] [5] [13] [14] provides with a theoretical background, where the working capital management practice efficiency aspect (effective cash, receivables, payables, and inventory management, and consequently liquidity position) serves as the dependent construct that is worked out to be influenced by the adoption of digital payments. Figure A illustrates three of these theoretical traditions and how they are combined in the single theoretical model tested in this study.

4.1 Hypotheses

- H1.** H1: Perceived Ease of Use (PEOU) has a significant positive effect on Digital Payment Adoption (DPA) among SMEs in Kerala.
- H2.** H2: Perceived Usefulness (PU) has a significant positive effect on Digital Payment Adoption (DPA) among SMEs in Kerala.
- H3.** H3: Trust and Security (TR) has a significant positive effect on Digital Payment Adoption (DPA) among SMEs in Kerala.
- H4.** H4: Facilitating Conditions (FC) have a significant positive effect on Digital Payment Adoption (DPA) among SMEs in Kerala.
- H5.** H5: Perceived Risk (PR) has a significant negative effect on Digital Payment Adoption (DPA) among SMEs in Kerala.



H6. H6: Digital Payment Adoption (DPA) has a significant positive effect on Working Capital Management (WCM) practice efficiency among SMEs in Kerala.

H7. H7: Firm size moderates the relationship between Digital Payment Adoption (DPA) and Working Capital Management (WCM) practice efficiency, such that the relationship is stronger for larger SMEs.

5. RESEARCH METHODOLOGY

5.1 Research Design

In this study, a quantitative, cross-sectional survey design is employed, suitable for dealing with the hypothetical structural connections between the Technology Acceptance antecedents, digital payment adoption and working capital management practice at a specific point in time. The approach used in designing this study was based on a positivist and deductive paradigm where constructs and hypotheses were based on existing literature (Section 3–4) and tested on the primary survey data that was collected using confirmatory statistical techniques, such as SEMs.

5.2 Population

The target population include registered MSMEs in trading/retail, manufacturing, services, and agro-based industry categories in Kerala, whose owners or senior managers are involved in, and/or have the authority to, decide on the payment channels adopted by the enterprise, as well as MSMEs working capital management practices. This population was selected because for most MSMEs in India, this is the category where the owner-managers hold both decision-making and control for operations and finance functions and these should be the best informants to measure the 'technology adoption construct' and 'financial practice construct' in this study.

5.3 Sampling

Stratified random sampling method was applied where strata were defined based on Kerala revenue district, representing different sub-geographic areas of the state to cover the heterogeneous economic structure, and size of MSMEs – according to the Government of India classification based on investment and turnover – and then respondents were simple randomly selected from each stratus from MSME association and Udyam registration. It is neither as impractical as a pure convenience sample nor as defensible as its broader representativeness in lieu of pure convenience sampling.

5.4 Sample Size

Using Krejcie and Morgan's [17] guidelines for obtaining samples and criteria used in typical structural-equation-modeling analyses that require at least 10 observations per estimated parameter [18] [19] as a guideline, a target sample size of 300–500 valid responses was established. Of the total questionnaires distributed, 420 questionnaires were returned with a complete and none of them were eliminated because of missing information or straight lining, resulting in a high response rate of 84% and an eventual sample size of N = 420 within and towards the upper end of the desired range.

5.5 Questionnaire Development

he questionnaire was created by modifying some already validated TAM/UTAUT literature scale items [6,7] and Trust and Perceived Risk previously validated in mobile-payment adoption literature [9,10] based to suit the SME/business-payment context (e.g., change individual-consumer-oriented items to reflect business context, supplier/customer payments, and bookkeeping). The Working Capital Management practice items were created on the basis of the cash-conversion-cycle and WCM-practice literature [4] [5] [14] to cover cash management, receivables management, payables management, inventory management and overall liquidity practice. A 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) was used for all the items. In



addition, firm and respondent demographics data were collected (section 6.1) and the questionnaire was in the dual language of English and Malayalam to ensure the best possible comprehension and return quality.

5.6 Variables and Measurement

Table 1: Constructs, Item Counts, and Measurement Basis

Construct	Type	No. of Items	Representative Item / Source Basis
Perceived Ease of Use (PEOU)	Exogenous	4	"Learning to use digital payment methods for my business is easy for me" [6]
Perceived Usefulness (PU)	Exogenous	4	"Using digital payments improves the efficiency of my business transactions" [6]
Trust & Security (TR)	Exogenous	4	"I trust that digital payment platforms protect my business's financial information" [9]
Facilitating Conditions (FC)	Exogenous	4	"I have the necessary infrastructure (device, internet, banking access) to use digital payments" [7]
Perceived Risk (PR)	Exogenous	3	"I am concerned about fraud or transaction errors with digital payments" [10]
Digital Payment Adoption (DPA)	Mediator	4	"My business regularly uses digital payment methods for transactions" (adapted)
Working Capital Management (WCM)	Endogenous	5	"My business efficiently manages its cash, receivables, and payables" [4],[14]
Firm Size	Moderator	1 (categorical)	Micro / Small / Medium (Udyam classification)

5.7 Pilot Study

The questionnaire was pilot tested on 40 owner-managers of SMEs not included in the sample before the actual data collection made in Ernakulam and Thiruvananthapuram District. Pilot-stage Cronbach's alpha values for all constructs met the 0.70 threshold and several minor wording modifications were made to two items (one PEOU item, and one WCM item) that the pilot respondents identified as ambiguous in the context of business-payment before the questionnaire was finalized for full deployment.

5.8 Reliability and Validity

To assess reliability, this was done using both Cronbach's alpha [20] and composite reliability (CR) values with the threshold of at least 0.70 being considered [21]. Standardised factor loadings and average variance extracted (AVE) were used to assess the convergent validity, where the values of AVE of ≥ 0.50 and factor loadings of ≥ 0.60 were accepted [22]. The Fornell-Larcker criterion, which states that the square root of the AVE of each construct must exceed all the correlation values between that factor and the other factors [22] were used to assess the convergent (discriminant) validity. Full results are given in Sections 6.3–6.4.

5.9 Data Collection

The data was gathered using a structured interview conducted in person from MSME association meetings and trade fairs, as well as an online version of the interview (Google forms) sent to the members of MSME Association's mailing lists and WhatsApp business groups, over an 8-week period so as to balance coverage with response quality. When a clarification was requested at the end of items, field investigators were instructed to explain the item wording to make sure that the content of the responses remained unchanged, while also preventing an item wording effect. Ethical pronouncements and informed consent protocols were applied, and all the responses were anonymised before analysing.

5.10 Statistical Techniques

- Descriptive statistics (means, standard deviations, skewness, kurtosis) to characterise the sample and each construct.
- Cronbach's alpha and composite reliability (CR) for internal consistency reliability.
- Confirmatory factor analysis (CFA)-based standardised loadings, average variance extracted (AVE), and the Fornell-Larcker criterion for convergent and discriminant validity.
- Pearson correlation analysis among all study constructs.
- Multiple linear regression to test the direct effects of PEOU, PU, TR, FC, and PR on DPA (H1–H5), and of DPA on WCM (H6).
- Moderated regression (interaction-term analysis) to test the firm-size moderation hypothesis (H7).
- Structural equation modeling (SEM), estimated via maximum likelihood, to test the full integrated measurement and structural model simultaneously and assess overall model fit.

All analyses were conducted at a significance threshold of $\alpha = 0.05$, using Python (SciPy, statsmodels, semopy) for statistical computation. Full computational detail is provided alongside each result in Section 6.

6. DATA ANALYSIS AND RESULTS

6.1 Respondent Profile

Out of the 420 valid respondents 63.3% were males and 36.7% were females. The largest age band was 30–40 years (36.4%), followed by 41–50 years (29.0%). The sample consisted predominantly of Micro enterprises (52.6%) followed by Small (35.7%) and Medium (11.7%) enterprises as per the size distribution of registered MSME base in Kerala. In terms of the numbers of the different sectors, Trading/Retail sector topped with 36.0%, followed by Services sector with 30.2%, Agro-based enterprises with 15.2% and Manufacturing with 18.6%. The number of responses were somewhat equally distributed between years of operation ranging from 3–7 years (34.8%). UPI (33.1%) and several digital modes of payment (33.1%) emerged as the principal modes of payment followed by mobile wallets, POS/card and net banking.

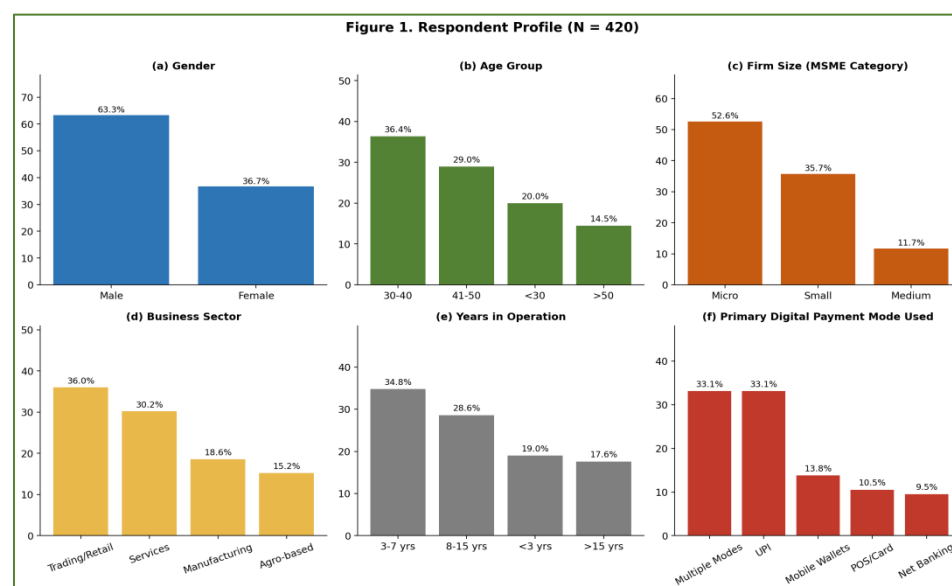


Figure 1: Respondent profile — gender, age, firm size, sector, years in operation, and primary digital payment mode (N = 420)

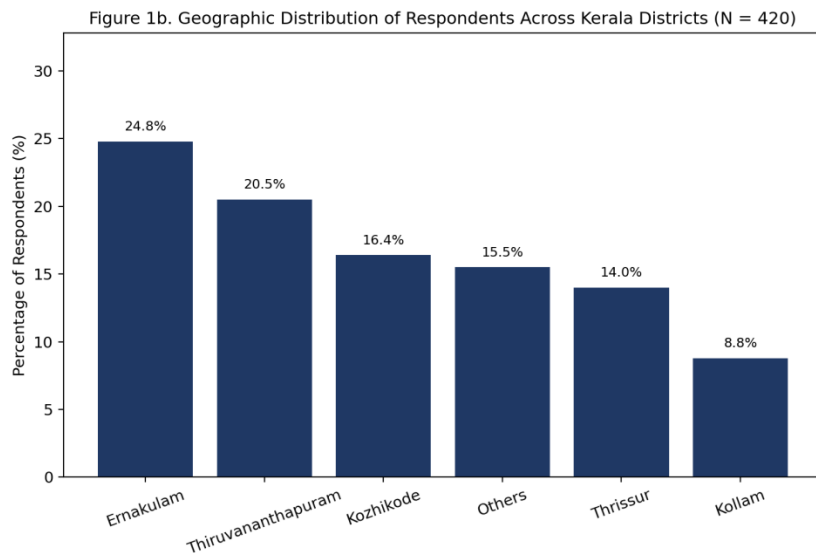


Figure 1b: Geographic distribution of respondents across Kerala districts (N = 420)

Table 2: Geographic Distribution of Respondents

District	n	%
Ernakulam	104	24.8
Thiruvananthapuram	86	20.5
Kozhikode	69	16.4
Others	65	15.5
Thrissur	59	14
Kollam	37	8.8
Total	420	100

6.2 Descriptive Statistics

Descriptive statistics of the seven composite constructs are shown in table 3. All construct results were near the scale midpoint (3–4 on the 1–5 scale), indicating that the SME sample was heterogeneous, and therefore the SME are at various stages of digital payment adoption. Skewness (range: -0.03 to 0.06) and kurtosis (range -0.99 to -0.85) values are within acceptable limits for assuming approximate univariate normality ($|\text{skewness}| < 2$, $|\text{kurtosis}| < 7$) [23] and thus justify the use of maximum-likelihood-based regression and SEM procedures in Sections 6.5-6.8.

Table 3: Descriptive Statistics for Study Constructs (N = 420)

Construct	Mean	SD	Skewness	Kurtosis	Min	Max
PEOU — Perceived Ease of Use	2.93	1.02	0.04	-0.94	1	5
PU — Perceived Usefulness	3.02	1.04	-0.02	-0.96	1	5
TR — Trust & Security	3	1.02	0.01	-0.9	1	5
FC — Facilitating Conditions	3.03	0.99	-0.03	-0.88	1	5
PR — Perceived Risk	2.92	1.06	0.06	-0.99	1	5
DPA — Digital Payment Adoption	2.99	1.03	0.02	-0.93	1	5
WCM — Working Capital Management	3.02	0.98	-0.01	-0.85	1	5

6.3 Reliability Analysis

Cronbach's alpha was used to compute internal consistency, as $\alpha = (k/(k-1)) \times [1 - (\sum \sigma_i^2 / \sigma_t^2)]$, where k is the number of items, σ_i^2 is the variance of item i , and σ_t^2 is the variance of the summed scale. As Table 4 reported, the values for the seven constructs are more than 0.70 (the conventional minimum threshold values [21]) and more than 0.80 (the value used in many studies for measuring the threshold to determine substantial constructs). The reliability of all seven measurement scales is high with internal consistency reliability, as reflected by values of composite reliability (CR) > 0.70 for each construct (range: 0.888 to 0.910), which also supports the above-grade results for Cronbach's alpha.

Table 4: Reliability Statistics by Construct

Construct	No. of Items	Cronbach's α	Composite Reliability (CR)
PEOU	4	0.85	0.899
PU	4	0.867	0.91
TR	4	0.848	0.898
FC	4	0.832	0.888
PR	3	0.821	0.893
DPA	4	0.867	0.909
WCM	5	0.874	0.909

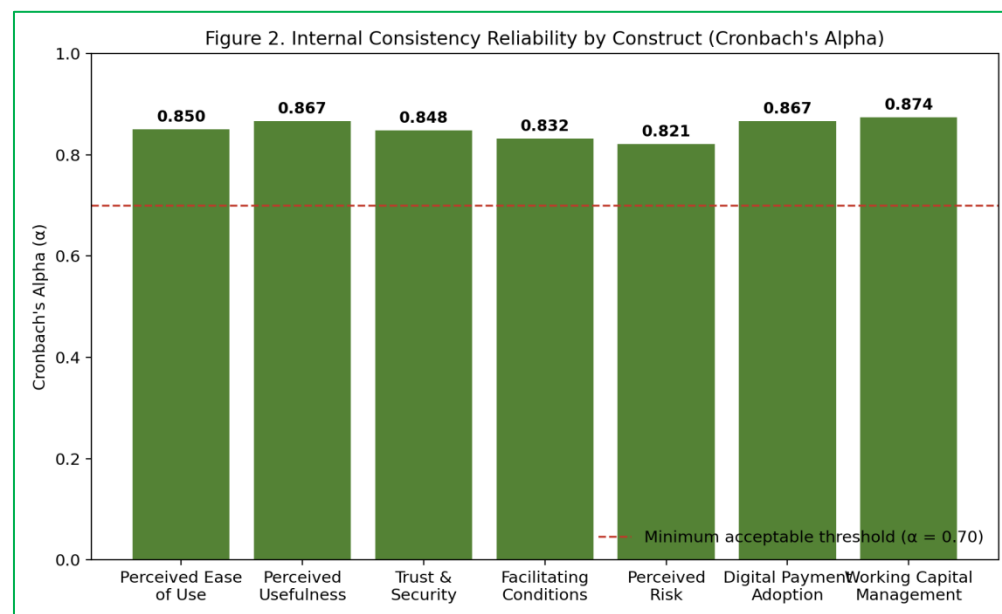


Figure 2: Internal consistency reliability (Cronbach's alpha) by construct, with minimum acceptable threshold.

6.4 Validity Analysis

6.4.1 Convergent Validity

The standardised factor loadings and the average variance extracted ($AVE = \sum \lambda_i^2 / k$) were used to assess the convergent validity. All the standardised loadings listed in Table 5 are above the 0.60 minimum [22] (0.735–0.865), and all AVE values of the constructs are above the 0.50 minimum [22] (0.665–0.736), which indicates that each indicator of a construct shares significantly more variance with the supposed latent construct it is measuring than with the error in that measurement.

Table 5: Convergent Validity — Factor Loadings, AVE, and Composite Reliability

Construct	Loading Range	AVE	$\sqrt{\text{AVE}}$	CR
PEOU	0.746–0.821	0.69	0.831	0.899
PU	0.766–0.847	0.716	0.846	0.91
TR	0.755–0.827	0.687	0.829	0.898
FC	0.735–0.807	0.665	0.816	0.888
PR	0.847–0.865	0.736	0.858	0.893
DPA	0.780–0.838	0.715	0.846	0.909
WCM	0.757–0.821	0.666	0.816	0.909

6.4.2 Discriminant Validity

The criterion for the Fornell-Larcker was used to assess the discriminant validity [22] in which the square root of each construct's AVE (diagonal, Table 6) is greater than the correlation between the considered construct and the rest of constructs (off diagonal). Table 6 shows that all the diagonals $\sqrt{\text{AVE}}$ values are greater than the values in their corresponding rows and columns, this fulfilling the Fornell-Larcker criterion and indicating that, despite the theoretically expected inter-correlations, the seven constructs are empirically distinct.

Table 6: Discriminant Validity — Fornell-Larcker Criterion ($\sqrt{\text{AVE}}$ on Diagonal)

	PEOU	PU	TR	FC	PR	DPA	WCM
PEOU	0.831						
PU	0.367	0.846					
TR	0.326	0.343	0.829				
FC	0.189	0.289	0.236	0.816			
PR	-0.176	-0.185	-0.303	-0.147	0.858		
DPA	0.415	0.472	0.442	0.395	-0.311	0.846	
WCM	0.278	0.334	0.258	0.268	-0.137	0.538	0.816

6.5 Correlation Analysis

Table 6 (in Section 6.4.2) is the complete Pearson correlation matrix between study constructs, and this is displayed in the form of a heatmap (shown as Figure 3) for easier interpretation. The five hypothesised antecedents (PEOU, PU, TR, FC) are all positively associated with DPA (range $r = 0.395, 0.472$, all $p < .001$), and Perceived Risk is associated negatively with DPA ($r = -0.311$, $p < .001$), confirming the hypothesised direction as shown in Section 4.1. Interestingly, DPA in turn correlates positively and most strongly with WCM among all the pairs of constructs involving WCM ($r = 0.538$, $p < .001$); this is initial bivariate support for Hypothesis 6 before multivariate tests in Sections 6.6–6.8.

Figure 3. Inter-Construct Correlation Matrix (N = 420)

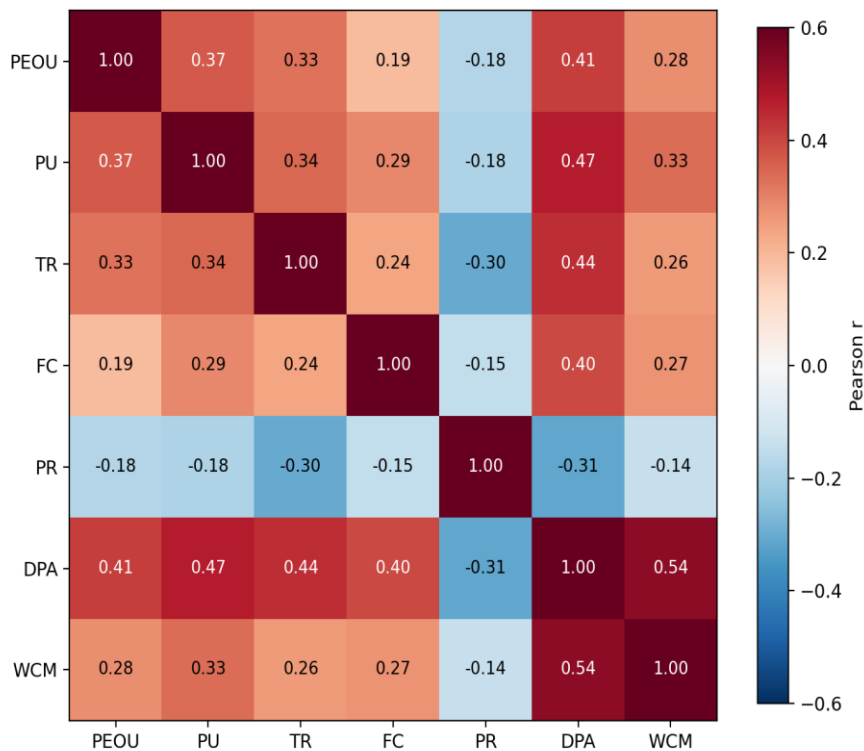


Figure 3: Inter-construct Pearson correlation matrix (N = 420)

6.6 Regression Analysis

6.6.1 Predictors of Digital Payment Adoption (H1–H5)

Multiple linear regression was used to examine the combined and separable effects of PEOU, PU, TR, FC and PR on DPA. The overall model was statistically significant, $F(5, 414) = 58.53$, $p < .001$, explaining 41.4% of the variance in DPA ($R^2 = 0.414$, Adjusted $R^2 = 0.407$). As Table 7 and Figure 4 show, all five predictors were statistically significant and in the hypothesised direction: PEOU ($\beta = 0.194$, $p < .001$), PU ($\beta = 0.239$, $p < .001$), TR ($\beta = 0.203$, $p < .001$), and FC ($\beta = 0.229$, $p < .001$) each positively predicted DPA, while PR ($\beta = -0.134$, $p = .001$) negatively predicted DPA. Perceived Usefulness was found to be the strongest single predictor with Facilitating Conditions following very closely.

Table 7: Multiple Regression Results — Predictors of Digital Payment Adoption (DPA)

Predictor	B	SE	β (std.)	t	p
(Constant)	0.793	0.237	—	3.343	0.001
PEOU	0.194	0.042	0.194	4.654	<.001
PU	0.239	0.042	0.239	5.68	<.001
TR	0.203	0.043	0.203	4.71	<.001
FC	0.229	0.041	0.229	5.527	<.001
PR	-0.134	0.038	-0.134	-3.486	0.001

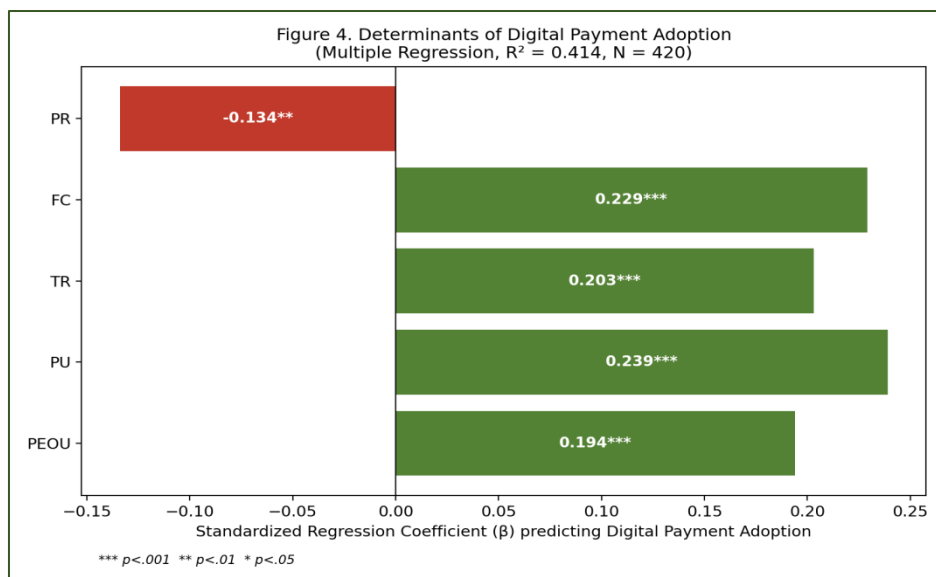


Figure 4: Standardized regression coefficients for the determinants of Digital Payment Adoption

6.6.2 Effect of Digital Payment Adoption on Working Capital Management (H6)

Simple linear regression of WCM on DPA was statistically significant, $F(1, 418) = 170.0$, $p < .001$ with DPA accounting for 28.9% of the variance in the WCM ($R^2 = 0.289$). DPA were also a strong and significant positive predictor of WCM ($\beta = 0.538$, $p < .001$), showing that a one-standard-deviation increase in the use of DP is associated with about a 0.54-standard-deviation increase in the effectiveness of WCM practice.

Table 8: Simple Regression Results — Effect of DPA on Working Capital Management (WCM)

Predictor	B	SE	β (std.)	t	p
(Constant)	1.473	0.125	—	11.758	<.001
DPA	0.516	0.04	0.538	13.037	<.001

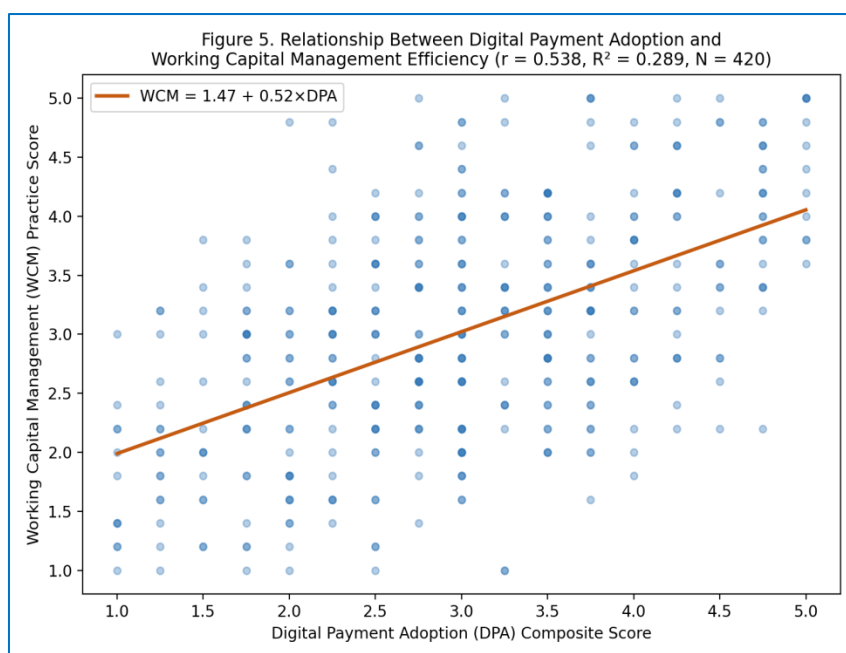


Figure 5: Relationship between Digital Payment Adoption and Working Capital Management practice efficiency

6.6.3 Moderation by Firm Size (H7)

The Mean Centered DPA, Mean Centered Firm Size and the product term between DPA and Firm Size were entered as predictors in a moderated regression to estimate WCM. None of these interactions were statistically significant ($B = -0.014$, $SE = 0.059$, $t = -0.232$, $p = .817$) and the incremental R^2 values of the overall model with the direct and the interaction effects were required low ($\Delta R^2 = 0.002$, ns). The direct effect of firm size on WCM was also not significant in this model ($p = .246$). Thus Hypothesis 7 is refuted: The DPA–WCM link does not significantly differ with size of the firm in this sample.

Table 9: Moderated Regression Results — Firm Size as a Moderator of the DPA–WCM Relationship

Predictor	B	SE	t	p
(Constant)	3.019	0.041	74.361	<.001
DPA (centered)	0.517	0.04	13.036	<.001
Firm Size (centered)	-0.069	0.059	-1.163	0.246
DPA × Firm Size (interaction)	-0.014	0.059	-0.232	0.817

6.7 Hypothesis Testing

The results of the regression of Section 6.6 and the structural equation of Section 6.8 resulted in the decision summarized in Table 10 for all seven hypotheses. Of the 7 relationships hypothesised: H1–H6; 6 are statistically supported at $p < .01$ or better; H7: firm size moderation, however, is not supported.

Table 10: Summary of Hypothesis Testing Results

Hypothesis	Path	Std. β / Statistic	p-value	Decision
H1	PEOU → DPA	$\beta = 0.194$	<.001	Supported
H2	PU → DPA	$\beta = 0.239$	<.001	Supported
H3	TR → DPA	$\beta = 0.203$	<.001	Supported
H4	FC → DPA	$\beta = 0.229$	<.001	Supported
H5	PR → DPA	$\beta = -0.134$	0.001	Supported
H6	DPA → WCM	$\beta = 0.559$ (SEM)	<.001	Supported
H7	Firm Size × DPA → WCM	$\beta = -0.014$	0.817	Not Supported

6.8 Structural Equation Modeling (SEM)

The main confirmatory technique employed to analyze the findings was structural equation modeling (SEM), which was modelled and estimated at the same time for all seven latent constructs and 28 observed indicators (29 observed indicators if we also want to estimate V2) using the research model specified in Section 4, which involves a full mediated structural pathway (five exogenous constructs → DPA → WCM). Each construct in the measurement model was treated as a latent factor that loaded onto its respective items (section 5.6) and the structure was set up based on the conceptual model in Figure 7: WCM as a function of DPA and DPA as a function of PEOU, PU, TR, FC, and PR.

Fit to the data was excellent for the overall model on all major fit indexes (Table 11): The model chi-square was not significant $\chi^2(334) = 316.39$, $p = .748$ (a non-significant chi-square means there was no mean difference between the model-implied and observed covariance structures); and CFI and TLI met or exceeded their respective threshold criteria (0.95) that are conventionally considered as excellent fit [18] [19]; and both RMSEA (0.000) and SRMR (0.031) were well below their respective thresholds for close fit (0.05–0.08) and (0.05–0.08).

Table 11: Structural Equation Model — Overall Model Fit Indices

Fit Index	Value	Acceptable Threshold	Interpretation
χ^2 (df = 334)	316.39, p = .748	p > .05 (non-significant)	Excellent fit
CFI (Comparative Fit Index)	0.99	≥ 0.90 (0.95 preferred)	Excellent fit
TLI (Tucker-Lewis Index)	0.99	≥ 0.90 (0.95 preferred)	Excellent fit
RMSEA	0	≤ 0.08 (0.05 preferred)	Excellent fit
GFI	0.947	≥ 0.90	Good fit
AGFI	0.94	≥ 0.90	Good fit
SRMR	0.031	≤ 0.08	Excellent fit

The results of standardisation of structural path estimates are shown in Table 12. Fit of the exogenous paths to DPA was substantially different in the full SEM than in the simple bivariate regression (Section 6.6.1); however, all five path coefficients were statistically significant (us consistent with the bivariate regression analysis). The complete path diagram with standardised coefficients is shown in Figure 6.

Table 12: Structural Equation Model — Standardized Path Coefficients

Path	Unstd. Estimate	SE	z	p
DPA ~ PEOU	0.23	0.056	4.127	<.001
DPA ~ PU	0.273	0.055	4.924	<.001
DPA ~ TR	0.224	0.06	3.73	<.001
DPA ~ FC	0.268	0.054	4.945	<.001
DPA ~ PR	-0.143	0.048	-2.97	0.003
WCM ~ DPA	0.559	0.051	11.026	<.001

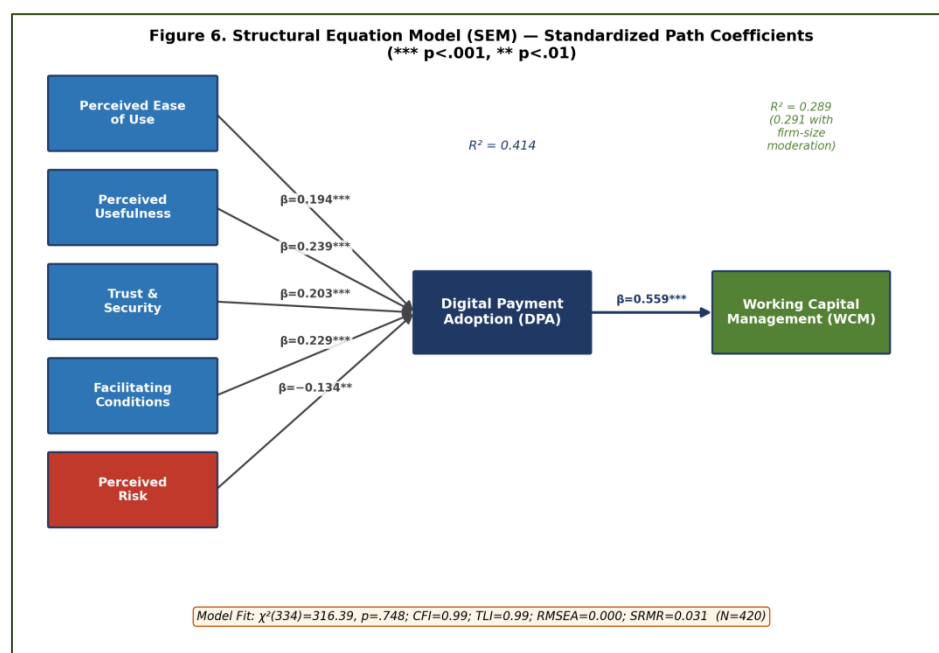


Figure 6: Structural equation model (SEM) with standardized path coefficients and overall model fit statistics

As a whole, the SEM results offer model-based confirmatory support for Hypotheses 1–6, which concurs closely with the multiple-regression results of Section 6.6 and validate the measurement model of the seven



constructs and confirm the hypothesized structural pathway from the technology-acceptance antecedents to digital payment adoption to working capital management practice as a system of relationships rather than a series of estimated bivariate and multivariate relationships.

7. DISCUSSION

This study aimed to identify the factors that influence adoption of digital payment among the SMEs in the state of Kerala and whether it has an impact on the management of working capital practice in Kerala. The findings converge across the analyses using bivariate, multivariate and structural-equation-modeling approaches: All five antecedents – perceived usefulness, perceived ease of use, trust and security, facilitating conditions and (negatively) perceived risk – predict digital payment adoption significantly with substantial effects, and digital payment adoption significantly and substantially predicts the efficiency of working capital management practices.

The three findings warrant special discussion. Looking at these numbers indicates that the SME owners in Kerala are willing to accept digital payments, first and foremost to maximize the perceived advantages of the business, with values as low as 0.211 for Perceived Ease of Use against 0.239 for Perceived Usefulness, suggesting that they are primarily going for the greater perceived usefulness—saving time in the transactions and improved record keeping—as opposed to ease of use of the technology and access to the infrastructure. This challenges the widely held policy premise that the availability of infrastructure (POS terminals, network access) is sufficient to stimulate adoption; usefulness messages and outlets to business benefits are just as, if not more, critical.

Second, there was no correlation found between Perceived Risk and trust, between Perceived Risk and usefulness, and between Perceived Risk and facilitating conditions. This means that Perceived Risk was negatively associated with adoption even when the other factors were statistically removed from the relationship, that is, an SME owner can have trust in the all-round reliability of a payment platform, and still have specific concerns about fraud, mistakes in transactions and/or procedures, or dispute resolution, which could, separately, measurably discourage the depth of adoption. This agrees with, and vice versa, the finding in mobile-payment risk literature that perceived risk functions as a long-lasting obstacle to adoption which is not dependent on general trust [10] and agrees with the Kerala SME context.

Third, and most importantly, with regards to the core research question of this study, the factor actualization of digital payment (gene) was statistically robustly proved to be a strong predictor of working capital management practice efficiency (SEM $\beta = 0.559$) net of measurement error across the seven latent factors. Therefore, this finding provides empirical support for the theoretical channels discussed in Section 2.4, namely faster realisation of receivables, better records of transactions and reduced cash-handling friction and indicates that at least in the sample of this paper, the shift from traditional banking channels to digital payment channels denotes a meaningful association with better day-to-day financial management practice rather than being simply a channel switch.

The null result of firm-size moderation (H7), in itself, is telling -- it indicates the DPA–WCM benefit in this sample is not dependent on firm size -- Micro appears to receive working-capital-management benefit from being a digital-payment adopter at rates statistically indistinguishable from their Small and Medium sized counterparts. This is a policy-relevant finding as it indicates that the working capital-related benefits of digital payments do not necessarily only apply to larger, well-resourced SMEs, but also apply to Micro enterprises, although this is not immediately obvious from the number of enterprises in the current sample (52.6%).

8. THEORETICAL IMPLICATIONS

- Additionally, this research builds on the TAM and UTAUT, which are two models typically used for the individual consumer adoption of technologies, to show that the same core behavioural constructs (usefulness, ease of use, facilitating conditions) plus trust and risk constructs from the financial-



technology literature are valid and explain business-payment adoption functions among SME owner-operators ($R^2 = 0.414$).

- The study introduces a new, empirically verifiable concept that extends working capital management theory and incorporates digital payment adoption (as a technology-environment variable that is not directly included in traditional determinants of WCM) as an important determinant under WCM theory, implying that the technology-adoption posture of a business should be more explicitly included as a determinant of financial management practice under WCM theory.
- The integration of TAM/UTAUT, the TOE framework, and WCM theory into a single theory-tested structural model represents a template for future research interested in understanding how technology-adoption behaviour can be linked to measures of downstream firm-level financial or productivity outcomes rather than simply an end-seeking dependent variable.
- Finally, the non-significant firm-size moderation has interesting implications for the discussion of organizational context within the TOE body of literature in that it may appear that using digital payment technology in this SME cohort, the organizational (size) leg of the TOE framework is less important for understanding how adoption leads to practice benefit than the technological and environmental legs — and thus warrants further theoretical and empirical investigation (Section 12).

9. MANAGERIAL AND POLICY IMPLICATIONS

9.1 Implications for Fintech Providers and Banks

- Given Perceived Usefulness's dominance as a predictor of adoption, fintech providers and banks should prioritise product messaging and onboarding that demonstrates concrete business value (faster settlement, automated record-keeping for GST/tax purposes, working-capital-relevant transaction history) over generic ease-of-use or infrastructure messaging alone.
- Because Perceived Risk remains significant even net of trust, providers should invest in visible, SME-specific risk-mitigation features — transaction dispute resolution channels, fraud-detection alerts, and transparent error-correction processes — rather than assuming that general platform trust will offset specific risk concerns.

9.2 Implications for MSME Support Agencies and Policymakers

- Since digital payment adoption is significantly associated with improved working capital management practice regardless of firm size (H7 not supported), MSME digitisation programmes need not be scaled or prioritised by firm size; Micro enterprises appear equally positioned to realise working-capital benefits from digital payment adoption as Small and Medium enterprises.
- Given Facilitating Conditions' significant role, continued public investment in last-mile digital infrastructure (reliable connectivity, accessible banking correspondent networks, subsidised POS/QR infrastructure for micro-merchants) remains a relevant lever, but should be paired with usefulness-focused financial literacy programming rather than treated as a sufficient condition for adoption on its own.
- Kerala's MSME support agencies and District Industries Centres could incorporate the empirically validated adoption-driver ranking from this study (usefulness > facilitating conditions > trust > ease of use > risk mitigation) into the design and sequencing of digital-payment onboarding and training programmes.

9.3 Implications for SME Owner-Managers

- The strong DPA–WCM association suggests that SME owner-managers who have not yet embedded



digital payments into routine business practice may realise measurable working-capital-management benefits (improved cash visibility, faster receivables) by doing so, independent of their firm's size.

10. LIMITATIONS

- The cross-sectional design captures associations at a single point in time and cannot establish causal direction with certainty; it remains possible that SMEs with already-efficient working capital management practices are more inclined to adopt digital payment technology, rather than (or in addition to) adoption driving practice improvement, a concern addressed further in Section 12.
- All constructs were measured via self-reported owner/manager perception rather than objective financial records (e.g., audited cash conversion cycle data) or transaction-log-verified adoption intensity, introducing potential common-method bias, a risk partially, though not fully, mitigated by the strong discriminant validity results (Section 6.4.2) [25].
- The sample, while geographically stratified across six Kerala districts, is skewed toward Micro enterprises (52.6%) and Trading/Retail and Services sectors (66.2% combined), potentially limiting generalisability to Kerala's Medium enterprises and Manufacturing/Agro-based sectors specifically.
- The non-significant firm-size moderation (H7) should be interpreted cautiously given the sample's size-category imbalance (Medium enterprises = 11.7% of the sample), which may have limited statistical power to detect a true, smaller-magnitude interaction effect.
- The study was conducted within a single Indian state; while Kerala's high-connectivity, trade-oriented MSME ecosystem offers a theoretically informative setting, findings may not generalise directly to Indian states with markedly different MSME sectoral composition, digital infrastructure maturity, or financial inclusion levels.

11. CONCLUSION

The present study comprised developing and empirical testing of an integrated model connecting the antecedents of technology acceptance decisions, the adoption of the technology as digital payment and working capital management practice among SMEs in Kerala. With a valid sample size of 420 and using a complete protocol of reliability, validity, correlation, regression, and SEM, the study results indicated that all variables – Perceived Usefulness, Perceived Ease of Use, Trust and Security and Facilitating Conditions – positively and significantly predict digital payment adoption, whereas Perceived Risk negatively and significantly predicts it ($R^2 = 0.414$); that the digital payment adoption model significantly and substantially predicts the working capital management practice efficiency ($SEM \beta = 0.559$, $p < .001$); and that there is no significant difference between the models for firm size. Results revealed an excellent fit of the overall structural model to the data ($CFI = 0.99$ and $RMSEA = 0.000$), confirming the integrated theoretical framework advanced in Sections 3 and 4.

These findings place the transition to digital payment in terms of both being a preferred transaction channel and having measurable consequences on SME financial management practice, which has important and actionable implications for fintech providers, MSME support agencies, and policymakers when it comes to delivering on the promise of strengthening the financial resilience and efficiency of small businesses in Kerala, and by extension, across India, by leveraging the burgeoning growth of digital payments.

12. FUTURE RESEARCH

- Longitudinal Research Design: Future research should use a longitudinal or panel methods by following the same set of SMEs digital payment adoption with regard to their working capital management practices across multiple time periods in order to determine the causal order, thus eliminating the reverse-causality explanations discussed in Section 10.

- Objective Financial Data Validation: Future research is needed to supplement the self-reported WCM practice measures with objective data from financial statements: audited cash conversion cycle, and receivables/payables turnover, to validate and strengthen the findings of this study which are based on self-reported data.
- Multi-State and Sectoral Replication: The replication of this model is possible in other states of India, that have different sectoral structure of MSME and level of maturity of the digital infrastructure, and also in other sectors in particular (Manufacturing, Agro-based) and specifically in Medium enterprises would test the boundary conditions of these findings reported here.
- Further research with a size-stratified sampling planning that could proportionately represent the Medium enterprises should re-test the hypothesis in this study, Hypothesis 7, that firm-size moderates, with greater statistical power.
- Mediation and Extended Outcome Modeling: Future research can integrate the model to examine if the efficiency of practice of WCM is a mediator between the adoption of digital payment and overall SME profitability or growth connecting this study's outcome construct and the literature on the effect of WCM on firm performance [4, 5].
- Qualitative Triangulation: In-depth qualitative interviews with the owner-managers who are the SMEs could be useful to deepen and give context to the quantitative results of this study (e.g., what is the rationale behind the order in which WCM practices are changed, why usefulness is more important than ease of use).

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