

Digital Wallet Adoption in Afghanistan and Indonesia: An Integrated UTAUT2-TAM Framework with Financial Inclusion as a Cross-National Moderator

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Abstract

The rapid diffusion of digital wallets across emerging economies offers a critical opportunity to examine adoption drivers in markets at very different stages of financial inclusion. This study develops and tests an integrated model combining UTAUT2 and TAM, augmented with Financial Literacy and Digital Trust as antecedents, and examines Financial Inclusion Status as a cross-national moderator, comparing a low-inclusion market (Afghanistan) with a higher-inclusion market (Indonesia). Data were obtained from 150 active digital wallet users (Afghanistan, $n = 100$; Indonesia, $n = 50$), and analysed using PLS-SEM with multi-group analysis (MGA). The model explained 66.1 percent of the variance in behavioural intention. Social Influence, Hedonic Motivation, Digital Trust, and Financial Literacy were the strongest predictors, while Price Value was not significant at the pooled level. Financial Inclusion Status significantly moderated the Effort Expectancy to Behavioural Intention pathway, with markedly stronger effects for unbanked users. MGA confirmed significant cross-national differences between Afghanistan and Indonesia, notably stronger effects of Effort Expectancy and Financial Literacy in Afghanistan, consistent with its larger unbanked population. The study contributes a two-country comparison of structurally divergent markets, positions financial inclusion as a cross-national moderator, and offers evidence of cross-market heterogeneity for fintech strategy. The dataset is illustrative and intended for methodological demonstration.

Keywords: *Digital wallet adoption; UTAUT2; Financial inclusion; PLS-SEM; Multi-group analysis; Afghanistan; Indonesia*

1. Introduction

The proliferation of digital wallets has disrupted the financial services landscape across emerging economies, with global mobile-payment transaction values rising sharply on the back of high smartphone penetration, expanding mobile internet, and government-led financial inclusion initiatives (Demirguc-Kunt et al., 2022; World Bank, 2023). Digital wallets have become instruments of financial democratisation, reaching populations historically excluded from traditional banking, including in markets such as Afghanistan, where account ownership remains among the lowest in the world, and Indonesia, where fintech adoption has grown rapidly (Ozili, 2023; Suri & Jack, 2016).

Despite this diffusion, the e-wallet adoption literature remains fragmented and dominated by single-country studies with limited cross-national comparability (Singh & Sinha, 2020; Ly et al., 2021; Gan et al., 2022). Research rarely accounts for financial inclusion status as a moderating factor, despite its theoretical importance in emerging markets (Demirguc-Kunt et al., 2022; Ozili, 2023), and financial

literacy and digital trust are seldom integrated into UTAUT2-based models despite their salience in fintech adoption (Lusardi & Mitchell, 2014; Gefen et al., 2003; Luo et al., 2010).

Comparing Afghanistan and Indonesia is theoretically valuable because the two markets differ sharply in financial infrastructure and inclusion: Afghanistan is a low-inclusion, largely cash-based and unbanked context in which mobile money offers leapfrog potential, whereas Indonesia has a more developed fintech ecosystem with widely used wallets such as GoPay, OVO, and DANA (Jack & Suri, 2014; Suri & Jack, 2016). This contrast provides a stringent test of whether the same adoption drivers operate uniformly across structurally divergent markets.

This study addresses these gaps through four objectives: to test an integrated UTAUT2-TAM model augmented with Financial Literacy and Digital Trust; to examine Financial Inclusion Status as a cross-national moderator; to quantify cross-market heterogeneity between Afghanistan and Indonesia using MGA; and to provide actionable recommendations for digital wallet operators serving low- and higher-inclusion markets.

2. Literature Review and Theoretical Framework

2.1 Theoretical Foundation

UTAUT (Venkatesh et al., 2003) synthesised eight technology-acceptance models into four core predictors: Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions. UTAUT2 (Venkatesh et al., 2012) added Hedonic Motivation, Price Value, and Habit for consumer contexts, while TAM (Davis, 1989) contributes perceived usefulness and ease of use, capturing instrumental belief dimensions relevant to fintech beyond UTAUT2 (King & He, 2006). The integrated framework is warranted because UTAUT2 captures motivational drivers while TAM captures instrumental utility beliefs that independently predict behavioural intention in fintech contexts (Shaw, 2014; Liebana-Cabanillas et al., 2020).

Financial Literacy represents the cognitive capacity to evaluate and adopt complex financial products and is a key enabler of digital financial service adoption for populations with limited formal financial exposure (Lusardi & Mitchell, 2014; Morgan & Trinh, 2019). Digital Trust captures users' confidence in the security, privacy, and reliability of digital wallet platforms (Gefen et al., 2003; Pavlou, 2003; Luo et al., 2010). Financial Inclusion Status captures structural differences between banked, underbanked, and unbanked users, introducing a moderator largely neglected by prior UTAUT2 models and especially salient when comparing Afghanistan with Indonesia (Cull et al., 2014; Demircuc-Kunt et al., 2022).

2.2 Hypothesis Development

The hypotheses are: H1, Performance Expectancy positively predicts Behavioural Intention; H2, Effort Expectancy positively predicts Behavioural Intention; H3, Social Influence positively predicts Behavioural Intention, hypothesised as dominant in collectivist cultures; H4, Hedonic Motivation positively predicts Behavioural Intention; H5, Price Value positively predicts Behavioural Intention; H6, Habit positively predicts Behavioural Intention; H7, Financial Literacy positively predicts Behavioural Intention; H8, Digital Trust positively predicts Behavioural Intention; and H9, Financial Inclusion Status moderates the Effort Expectancy to Behavioural Intention relationship, with stronger effects for unbanked populations (Demircuc-Kunt et al., 2022; Ozili, 2023; Venkatesh et al., 2012).

3. Research Methodology

3.1 Research Design

A quantitative cross-sectional survey design was employed across two countries, Afghanistan and Indonesia. This design enables hypothesis testing across structurally different markets within a practical timeframe, consistent with prior multi-country fintech adoption studies (Baptista & Oliveira, 2015; Tarhini et al., 2016). The dataset used here is illustrative and intended for methodological demonstration of the analytical framework.

3.2 Data Collection

The sampling frame comprised mobile internet users aged 18 to 55 with at least one active digital wallet account in Afghanistan or Indonesia. The final sample comprised 150 respondents: Afghanistan (n = 100), reflecting wallets such as HesabPay and My Money, and Indonesia (n = 50), reflecting wallets such as GoPay, OVO, and DANA. This exceeds the PLS-SEM minimum for the model complexity involved (Hair et al., 2019). UTAUT2 constructs used four-item scales from Venkatesh et al. (2012), Financial Literacy used Lusardi and Mitchell's (2014) scale, and Digital Trust items were adapted from Gefen et al. (2003) and Luo et al. (2010). Financial Inclusion Status was categorical (0 = unbanked, 1 = underbanked, 2 = banked). All Likert items used a seven-point scale.

3.3 Data Analysis

Analysis used PLS-SEM in three stages. Stage 1 evaluated the measurement model: convergent validity (AVE at least 0.50; loadings at least 0.70), reliability (alpha at least 0.70; composite reliability at least 0.80), and discriminant validity via the HTMT ratio below 0.85 (Henseler et al., 2015). Stage 2 estimated the structural model with bootstrapping (5,000 resamples) and assessed predictive relevance via Q-squared. Stage 3 tested Financial Inclusion Status as a categorical moderator and conducted country-level MGA with permutation-based significance testing (Henseler et al., 2016). Common method bias was assessed via Harman's single-factor test.

4. Results and Discussion

4.1 Results

The demographic profile of the sample is presented in Table 1. The sample was dominated by Afghan respondents (66.7 percent), and financial inclusion was more limited than in single-country Indonesian studies, with 32.0 percent unbanked, reflecting the inclusion of a low-inclusion market.

Table 1. Demographic profile of respondents (N = 150)

Characteristic	Category	n	%
Country	Afghanistan	100	66.7
	Indonesia	50	33.3
Gender	Male	84	56.0
	Female	66	44.0
Age group	18 to 24 years	45	30.0
	25 to 34 years	51	34.0
	35 to 44 years	33	22.0
	45 to 55 years	21	14.0
Financial inclusion	Fully banked	57	38.0
	Underbanked	45	30.0
	Unbanked	48	32.0
Primary wallet	HesabPay / My Money (Afghanistan)	100	66.7
	GoPay / OVO / DANA (Indonesia)	50	33.3

Source: Illustrative survey data, 2026

The measurement model, summarised in Table 2, confirmed adequate reliability and validity: AVE ranged from 0.52 to 0.71, composite reliability from 0.81 to 0.94, and all HTMT ratios were below 0.85 (Henseler et al., 2015).

Table 2. Measurement model summary

Construct	AVE	CR	Cronbach's Alpha
Performance Expectancy (PE)	0.52	0.81	0.74
Effort Expectancy (EE)	0.58	0.85	0.79
Social Influence (SI)	0.63	0.87	0.82
Hedonic Motivation (HM)	0.67	0.86	0.78
Price Value (PV)	0.61	0.83	0.75
Habit (HA)	0.64	0.84	0.76
Financial Literacy (FL)	0.55	0.90	0.88
Digital Trust (DT)	0.69	0.91	0.88
Behavioural Intention (BI)	0.71	0.94	0.91

Source: PLS-SEM analysis (illustrative), 2026

The structural model, summarised in Table 3, showed an R-squared of 0.661 and a Q-squared of 0.488, confirming predictive relevance. Social Influence was the strongest predictor, followed by Hedonic Motivation, Digital Trust, and Financial Literacy. Price Value was not significant, rejecting H5; the other eight hypotheses were supported. Among unbanked users, the Effort Expectancy to Behavioural Intention path was substantially stronger than among banked users, confirming H9.

Table 3. Structural model results and hypothesis testing (N = 150)

Hyp.	Path	Beta	t-value	p-value	Decision
H1	PE to BI	0.182	3.10	0.002	Supported
H2	EE to BI	0.150	2.55	0.011	Supported
H3	SI to BI	0.296	5.42	<0.001	Supported
H4	HM to BI	0.254	4.61	<0.001	Supported
H5	PV to BI	0.089	1.62	0.106	Not supported
H6	HA to BI	0.128	2.27	0.024	Supported
H7	FL to BI	0.227	4.05	<0.001	Supported
H8	DT to BI	0.249	4.42	<0.001	Supported
H9	FI x EE to BI	0.198	3.34	0.001	Supported

Source: PLS-SEM analysis (illustrative), 2026. R-squared = 0.661; Q-squared = 0.488. FI = Financial Inclusion Status.

The multi-group analysis, summarised in Table 4, confirmed significant cross-national differences between Afghanistan and Indonesia. Effort Expectancy and Financial Literacy exerted significantly stronger effects in Afghanistan, consistent with its larger unbanked population, whereas Price Value was significant only in Indonesia, revealing cross-market heterogeneity.

Table 4. Multi-group analysis: Afghanistan versus Indonesia

Path	Beta (Afghanistan)	Beta (Indonesia)	Difference (p-value)
EE to BI	0.34	0.12	0.22 (0.012) *
FL to BI	0.28	0.16	0.12 (0.039) *
SI to BI	0.31	0.27	0.04 (0.481)
PV to BI	0.06	0.21	0.15 (0.028) *

4.2 Discussion

The dominance of Social Influence corroborates the argument that collectivist cultural orientations amplify social referents in technology adoption (Hofstede et al., 2010), which holds in both Afghanistan and Indonesia. This diverges from Western contexts where Performance Expectancy typically dominates (Baptista & Oliveira, 2015), implying that peer-referral programmes and socially embedded marketing are more effective than feature-centric promotion in these markets.

The significant effects of Financial Literacy and Digital Trust beyond the UTAUT2 baseline demonstrate that these constructs capture adoption variance neglected by established technology-acceptance theories, extending prior findings to a cross-market Afghanistan-Indonesia comparison (Morgan & Trinh, 2019). The high Digital Trust coefficient underscores risk-consciousness in digital payments, suggesting that trust-signalling investments yield measurable adoption returns, particularly in low-inclusion settings where formal financial trust is still developing (Luo et al., 2010).

The moderation of Financial Inclusion Status confirms that interface usability is a binary adoption barrier for unbanked populations rather than a mere convenience factor, which is especially consequential in Afghanistan. The MGA results, with stronger Effort Expectancy and Financial Literacy effects in Afghanistan and a significant Price Value effect only in Indonesia, reveal cross-market heterogeneity that single-country designs would obscure (Ozili, 2023). Simplified onboarding, guided tutorials, and financial-literacy support are therefore high-priority interventions for operators pursuing financial inclusion in low-inclusion markets (Cull et al., 2014; Jack & Suri, 2014).

5. Conclusion

This study integrated UTAUT2 and TAM with Financial Literacy and Digital Trust and examined Financial Inclusion Status as a cross-national moderator across 150 digital wallet users in Afghanistan and Indonesia. Eight of nine hypotheses were supported, and the model explained 66.1 percent of the variance in behavioural intention. The study contributes a comparison of two structurally divergent markets, an empirically illustrated cross-national moderating role for financial inclusion, and evidence of cross-market heterogeneity between a low-inclusion and a higher-inclusion economy.

For practitioners, the findings imply investment in trust-signalling mechanisms, social-proof features, and simplified interfaces and financial-literacy support for unbanked users, with market-specific calibration between Afghanistan and Indonesia. For policymakers, partnerships between fintech operators and financial-inclusion agencies can advance literacy and adoption simultaneously. Limitations include the cross-sectional design, the modest and illustrative sample, and the uneven country split; future research should employ larger and balanced samples, longitudinal designs, and objective transaction data, and extend the comparison to other low-inclusion economies.

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