

To What Extent Do E-Trust and Perceived Risk Determine Use of Online Payment for Fast-Moving Consumer Goods? Evidence from a Systematic Review in the Moroccan Context

**Dans quelle mesure la confiance numérique et le risque perçu déterminent-ils l'adoption des paiements en ligne pour les PGC ?
Une revue systématique dans le contexte marocain**

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Date de soumission : 21/04/2026

Date d'acceptation : 11/06/2026

Pour citer cet article :

EL AIBI. K & HAMIDI L.S. (2026) «To What Extent Do E-Trust and Perceived Risk Determine Use of Online Payment for Fast-Moving Consumer Goods? Evidence from a Systematic Review in the Moroccan Context» « Volume 9 : Numéro 2» pp : 120 - 144

Digital Object Identifier : www.doi.org/10.5281/zenodo.20813160

Abstract

The development of e-commerce in Morocco confronts a persistent structural paradox: despite significant growth in digital infrastructure, mobile payment solutions, and regulatory frameworks for consumer protection, online transaction adoption particularly in the Fast-Moving Consumer Goods (FMCG) sector remains markedly below its potential. This paper presents a systematic literature review of the theoretical frameworks that account for this situation, focusing on the constructs of digital trust and perceived risk as determinants of online payment behaviour. Drawing on a corpus of 52 peer-reviewed publications selected through a PRISMA-compliant protocol, the review mobilises and critically interrogates the Technology Acceptance Model (TAM), the Theory of Planned Behaviour (TPB), the UTAUT2 model, and the multi-level trust frameworks developed in the marketing and information systems literatures. The review reveals three underexplored tensions in the current literature: the insufficiently theorised interaction between dispositional trust and institutional trust in weak-regulation contexts; the limited treatment of FMCG-specific risk dynamics, particularly the sensory evaluation gap; and the near-absence of research integrating fintech innovations mobile wallets, open banking into trust formation models for everyday consumer goods. An integrative conceptual model is proposed articulating cognitive, affective, and contextual determinants of online payment adoption in Morocco. The paper is situated within a positivist epistemological paradigm and proposes ten hypotheses that can be tested empirically and quantitatively validated in future research.

Keywords : Digital trust ; Perceived risk ; Online payment behaviour ; FMCG e-commerce ; Morocco

Résumé

Le développement du commerce électronique dans le contexte marocain est freiné par un paradoxe structurel persistant : Malgré l'existence de solutions de paiement numérique et la présence des cadres réglementaires pour protéger les consommateurs, le recours au paiement en ligne des produits de grande consommation (PGC) reste nettement inférieur à son potentiel. Ce travail présente un état des connaissances, structuré par une revue systématique de la littérature portant sur les modèles théorisés qui permettent d'expliquer cette situation, en se focalisant sur les construits de la confiance numérique et du risque perçu en tant que déterminants du comportement de paiement en ligne. En s'appuyant sur un corpus de 52 publications scientifiques sélectionnées selon un protocole conforme à la démarche PRISMA, la revue mobilise et interroge de façon critique le Modèle d'Acceptation de la Technologie (TAM), la Théorie du Comportement Planifié (TCP), le modèle UTAUT2, ainsi que les cadres multi-niveaux de la confiance développés dans les littératures du marketing et des systèmes d'information. La revue souligne des tensions théoriques peu explorées : L'interaction insuffisamment théorisée entre la confiance dispositionnelle et la confiance institutionnelle dans des contextes faiblement régulés ; Le traitement limité des dynamiques sectorielles de risque propres au secteur PGC, notamment l'écart d'évaluation sensorielle. Nous développons un modèle conceptuel intégrateur qui combine les déterminants cognitifs, affectifs et contextuels de l'adoption du paiement numérique par les consommateurs marocains. Cet article s'appuie sur un paradigme épistémologique positiviste et formule dix hypothèses de recherche vérifiables empiriquement, en vue d'une validation quantitative ultérieure.

Mots clés : Confiance numérique ; Risque perçu ; Paiement en ligne ; E-commerce ; PGC ; Maroc

Introduction

The global digital economy has changed the conditions of commercial exchange. The path of e-commerce development in Morocco illustrates the potential and the limitations of digital transformation in emerging market economies. Electronic transactions through card payments reached close to 47 million operations in 2022, for a total value of over 31 billion MAD, according to the Centre Monétaire Interbancaire (CMI). As reported by the Haut-Commissariat au Plan (HCP, 2023), less than 20% of households in Morocco buy online regularly. The penetration rate is much lower in the fast-moving consumer goods (Food, personal care, and household products).

This is what we might call the trust-infrastructure paradox: the technical conditions for online commerce in FMCG are in place and improving, but consumer use is still hampered by psychological and cultural barriers that infrastructure investment alone cannot address. The academic literature identifies trust (Gefen, 2000; Lee and Turban, 2001; McKnight et al., 2002; Chouk and Perrien, 2005) as an important explanatory construct. However, the modalities through which trust operates and does not operate in the specific context of FMCG online payments in Morocco are undertheorized. Existing studies have dealt with online trust and perceived risk in Moroccan e-commerce in general terms (Bercheq et al., 2020; El Haraoui and Khatori, 2015). However, none has specifically addressed the FMCG sector as a theoretically distinct domain, nor has it integrated recent fintech developments (mobile wallets, open banking) into the trust formation framework. This is the scientific gap which the present article addresses.

The dominant models, TAM (Davis, 1989), TPB (Ajzen, 1991), and UTAUT2 (Venkatesh et al., 2012), were mainly developed in the context of durable goods or technology products. The assumption rather than the proof of their applicability to FMCG purchasing, where product tangibility, purchase frequency, and sensory evaluation routines create a unique context of trust. Against this background the article asks the following research question:

To what extent do E-trust and perceived risk, as theoretically framed in the marketing, information systems and consumer behaviour literature, explain the use of online payment solutions by Moroccan consumers for FMCG and which antecedents of trust are most theoretically salient in this specific sectoral and institutional context?

This question is posed within a positivist epistemological paradigm and requires a confirmatory, quantitative inquiry using a structured questionnaire and structural equation modeling (SEM). The current article offers a theoretical and methodological basis for such a study.

The objective of this paper is to:

- 1) Conduct a comprehensive systematic review of the digital trust and perceived risk literature in the context of online payments;
- 2) Critically assess the relevance of the dominant theoretical models to the Moroccan FMCG context and their limitations and contradictions;
- 3) Provide an integrative conceptual model based on ten empirically testable hypotheses.

The paper is organized as follows: Section 1 describes the methodological protocol in accordance with PRISMA. Section 2 reviews and critiques prevailing theoretical frameworks. In Section 3, the constructs of digital trust and perceived risk are discussed. These dynamics are discussed in Section 4 within the Moroccan FMCG digital landscape. Section 5: Integrative conceptual model and research hypotheses. The article ends with a discussion on theoretical contributions, limitations, and perspectives for future research.

1. Methodological Protocol: PRISMA-Compliant Systematic Review

1.1. Justification for the Systematic Review Approach

The systematic literature review (Tranfield, Denyer and Smart, 2003) distinguishes itself from the traditional narrative review in that it is transparent, replicable, and has explicit inclusion and exclusion criteria. Here the choice of this approach is justified for three reasons. First, the literature on online trust and perceived risk is broad, multidisciplinary, and characterized by substantial conceptual heterogeneity. Second, this paper is not an attempt to summarize what is already known, but to identify theoretical gaps and contradictions that are sufficiently rigorous to warrant a new conceptual model. And third, for a scientific contribution to be credible, it must be methodologically rigorous. This review is procedurally scaffolded by the PRISMA framework (Moher et al., 2009), which has been used in management and marketing research (Palmatier et al., 2018).

1.2. Search Strategy

The search covered the period from January 1994 to December 2024 and was conducted on Web of Science, Scopus, Google Scholar, and JSTOR. The following Boolean strings were applied to titles, abstracts, and keywords:

- ❖ **Search string 1:** ("online trust" OR "e-trust" OR "digital trust") AND ("online payment" OR "e-payment" OR "mobile payment") AND ("consumer behaviour" OR "purchase intention")
- ❖ **Search string 2:** ("perceived risk" OR "financial risk" OR "privacy risk") AND ("e-commerce" OR "online shopping") AND ("emerging markets" OR "Morocco" OR "developing countries")
- ❖ **Search string 3:** ("TAM" OR "Technology Acceptance Model" OR "UTAUT" OR "Theory of Planned Behaviour") AND ("e-commerce" OR "online payment") AND ("trust" OR "risk")
- ❖ **Search string 4:** ("FMCG" OR "fast-moving consumer goods" OR "grocery") AND ("online shopping" OR "e-commerce") AND ("trust" OR "adoption")
- ❖ **Search string 5:** ("fintech" OR "mobile wallet" OR "open banking" OR "digital payment") AND ("trust" OR "adoption") AND ("consumer" OR "behaviour")

1.3. Inclusion and Exclusion Criteria

Inclusion criteria:

Peer-reviewed articles published in indexed journals (SSCI, Scopus Q1–Q3, CNRST-listed Moroccan or AJOL-indexed African journals); studies that address at least two of the following: online trust, perceived risk, online payment intention, e-commerce adoption, consumer behavior; general consumer, FMCG, fintech/payment, African or MENA market contexts; English, French or Arabic publications.

Exclusion criteria and rationale:

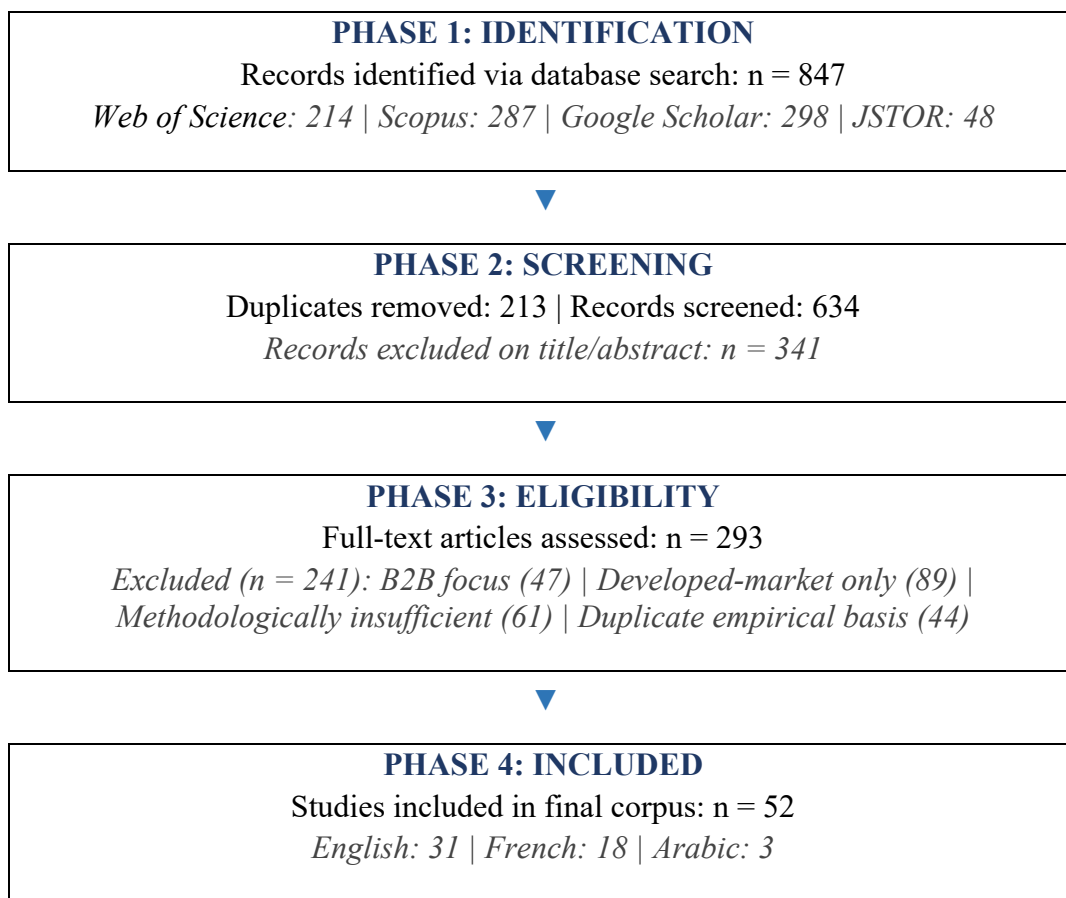
- ❖ Conference proceedings not subsequently published in peer-reviewed journals excluded due to inability to systematically assess the quality of grey literature;
- ❖ B2B studies excluded because the dynamics of organizational purchase decisions are theoretically distinct from the formation of individual consumer trust;
- ❖ Developed-market-only articles with no discussion of cross-cultural transferability were excluded because their institutional assumptions do not apply in weak-regulation contexts such as Morocco;
- ❖ Pre-1994 articles not constituting foundational theoretical references were excluded because the construct of digital trust did not exist prior to the early internet era;

- ❖ Duplicate publications - earlier versions- were excluded in favor of the most recent peer-reviewed iteration. In borderline cases, articles partly meeting criteria, a decision rule was applied: inclusion required meeting at least four of seven quality criteria at the 'Required' threshold (see Section 1.6).

1.4. PRISMA Flow Diagram

Figure N°1: PRISMA Flow Diagram

Literature Selection Process



Source: PRISMA, Moher et al., 2009

1.5. Data Extraction and Coding

Each of the 52 retained articles was coded along eight analytical dimensions:

- ❖ Theoretical Framework Mobilised;
- ❖ Constructs Studied;
- ❖ Empirical Or Theoretical Nature;
- ❖ Geographical Context;
- ❖ Sectoral Context;

- ❖ Methodological Approach;
- ❖ Principal Findings;
- ❖ Identified Limitations.

This coding grid enabled both thematic synthesis and identification of convergent and divergent findings the basis for the critical analysis in subsequent sections.

In order to ensure the reliability and replicability of the coding process (a methodological requirement for systematic reviews, which was identified to be lacking in prior versions of this paper), a formal inter-rater coding procedure was established, which consisted of four stages:

Table N°1: Inter-Rater Coding Procedure — Four-Stage Protocol

Stage	Procedure
Step 1: Independent coding	Each of the two authors independently coded all 52 retained articles across the eight analytical dimensions (theoretical framework, constructs, empirical/theoretical nature, geographical context, sectoral context, methodology, principal findings, and identified limitations), using a pre-defined coding grid developed during the eligibility phase.
Step 2: Agreement calculation	Inter-rater agreement was calculated using Cohen's Kappa coefficient (Cohen, 1960) for categorical coding decisions (inclusion/exclusion, article type, sectoral context). An initial Kappa of $\kappa = 0.81$ was obtained, indicating 'almost perfect agreement' (Landis and Koch, 1977) and confirming the reliability of the coding instrument.
Step 3: Discrepancy resolution	Discrepancies identified in 11 of the 293 full-text articles (3.75%) were resolved through structured discussion between the two coders. In cases where consensus could not be reached through discussion ($n = 3$), a pre-agreed decision rule was applied: articles were included if they met at least four of the seven quality assessment criteria at the 'Required' threshold.
Step 4: Final coding validation	Following the discrepancy resolution, the lead author performed a final validation pass on all 52 included articles to ensure coding consistency across the full corpus. This validation confirmed stable coding for all eight dimensions with no further amendments required.
Coding instrument	A structured Excel-based coding grid was used, with pre-defined categorical options for each of the eight dimensions and a free-text field for qualitative observations. The coding grid is available from the corresponding author upon reasonable request.

Source: Authors' own protocol. Cohen's Kappa calculated following Cohen (1960); agreement thresholds following Landis and Koch (1977).

1.6. Quality Assessment of Included Studies

The systematic review literature separates the decision on which studies to include from the assessment of their methodological quality (Tranfield et al., 2003; Palmatier et al., 2018).

Quality assessment does not necessarily imply exclusion in systematic literature reviews in management research, but it allows for differential weighting of evidence in the synthesis and transparency about the evidential basis of theoretical claims. We used the following quality criteria, adapted from the Critical Appraisal Skills Program (CASP, 2018) framework and calibrated to the mixed-method nature of the corpus:

**Table N°2: Quality Assessment Framework for Included Studies
(adapted from CASP, 2018)**

Criterion (adapted from CASP)	Weight	Theoretical articles	Empirical quantitative	Empirical qualitative	Mixed-method
Clarity of research question / objective	High	✓ Required	✓ Required	✓ Required	✓ Required
Appropriateness of theoretical framework	High	✓ Required	✓ Required	○ Desirable	✓ Required
Methodological transparency	Medium	○ Desirable	✓ Required	✓ Required	✓ Required
Validity and reliability of measures	Medium	N/A	✓ Required	○ Desirable	✓ Required
Relevance of context (emerging market / MENA / Africa)	High	✓ Required	✓ Required	✓ Required	✓ Required
Recency of empirical evidence (post-2015 prioritised)	Medium	○ Desirable	✓ Required	✓ Required	✓ Required
Contribution to trust-risk-adoption nexus	High	✓ Required	✓ Required	✓ Required	✓ Required

Source: Authors' adaptation of CASP (2018).

✓ Required = criterion must be met for inclusion;

○ Desirable = criterion strengthens but is not required for inclusion;

N/A = criterion not applicable to article type.

The use of this framework on the 52 included articles demonstrated that 41 (79%) articles met five or more criteria at the 'Required' level, confirming the overall high quality of the corpus. The 11 articles that met three or four criteria were mostly foundational theoretical papers (e.g., Davis, 1989; Ajzen, 1991; Mayer et al., 1995). These papers were selected according to their seminal nature, not their methodological profile. The synthesis indicates that the claims are predominantly based on seminal sources and not theoretically or empirically validated in the context of FMCG/MENA.

2. Theoretical Frameworks: Critical Review and Limitations

2.1. The Technology Acceptance Model (TAM)

Davis's (1989) TAM identifies perceived usefulness (PU) and perceived ease of use (PEoU) as the two main factors in technology adoption. PU is perceived channel value (time saving, price comparison, product diversity), and PEoU is interface accessibility in the online payment context. Out of the 52 reviewed articles, 34 employ the TAM and its extensions.

We identify three main limitations for the Moroccan FMCG context.

First, the TAM was developed for organizational technology adoption, a structural mismatch with the habitual, low-deliberation dynamics of FMCG purchasing.

Second, trust and risk are not natively integrated; their roles as antecedents or moderators (Pavlou, 2003; Suh and Han, 2003) lead to heterogeneous model specifications that preclude comparison across studies.

Third, the TAM has been demonstrated to have predictive validity primarily in high-trust, high-regulation institutional settings. Bercheq et al. (2020) provide partial empirical support for this critique: 18% of Moroccan non-buyers state process complexity (PEoU), but this is co-existent with a dominant trust-deficit explanation (54% cite lack of trust), a co-existence the TAM cannot theorize because it treats PEoU and trust as analytically independent. Recent evidence from Africa (Abubakar et al., 2022; Sabi et al., 2018) confirms that this limitation is not specific to Morocco but is structurally characteristic of weak-regulation markets throughout the continent.

2.2. The Theory of Planned Behaviour (TPB)

Based on Ajzen's TPB (1991), behavioural intention is determined by the combination of attitudes, subjective norms, and perceived behavioural control (PBC). El Haraoui and Khatori (2015) explicitly use this framework to analyse the Moroccan online consumer. They show that the cultural habituation barrier of preference for sensory inspection, price negotiation, and interpersonal vendor relations is a negative attitude to online purchasing that is not reducible to risk or usability issues. This dimension was the largest single barrier category, representing 30% of non-adoption responses in their sample.

However, the one-dimensional perspective of 'attitude' as an evaluative judgment in the TPB tends to conceal the affective-cognitive split: a consumer may have a positive cognitive attitude (online shopping is efficient) and a negative affective attitude (online shopping feels unsafe and

impersonal) simultaneously. Mayer et al. (1995) provide a theoretical vocabulary for unpacking this division, differentiating between cognitive and affective trust, but the TPB does not natively allow for this distinction.

2.3. The UTAUT2 Model

Venkatesh et al. (2012) included hedonic motivation, price value, habit, and experience as additional determinants of behavioral intention in UTAUT2. The UTAUT2 model is highly relevant to FMCG online payment research because incorporating habit directly addresses the cultural habituation barrier: habitual offline purchasing creates inertia against adopting the online channel. However, the systematic review shows that only 4 out of the 52 reviewed articles explicitly mobilize UTAUT2, and none applies it to the FMCG sector in the context of emerging markets. Integration of it with trust and perceived risk constructs is underdeveloped in the corpus, a critical gap that is addressed by the present article.

2.4. Trust Frameworks: From Dispositional to Institutional Trust

Three analytically distinct forms of trust recur in the corpus: dispositional trust (a generalized tendency to trust on the part of an individual), experience-based trust (developed through positive interactions with a specific vendor), and institutional trust (derived from the perceived reliability of regulatory frameworks). In Morocco, where awareness of the laws that protect digital consumers (Law 09-08, Law 31-08) is low (Bercheq et al., 2020), dispositional trust has a disproportionate explanatory power for first-time purchase intentions because consumers cannot rely on systemic guarantees. The gap between the existence of regulations and consumer awareness creates a perceived institutional deficit which increases the importance of vendor and site-level trust signals.

Another important tension: Chang and Fang (2013) suggest that trust and distrust are not two ends of the same continuum, but two separate constructs; a consumer can simultaneously have moderate amounts of both, leading to motivational ambivalence. This nuance is absent from most standard trust models and is especially relevant to the ‘mistrustful cyber-consumer’ profile identified by Bercheq et al. (2020) among Moroccan online buyers.

Table N°3: Critical Comparison of Dominant Theoretical Frameworks Applied to FMCG Online Payment Adoption in Morocco

Dimension	TAM (Davis, 1989)	TPB (Ajzen, 1991)	UTAUT2 (Venkatesh et al., 2012)
Core constructs	PU, PEOU	Attitude, Subjective norms, PBC	Performance expectancy, Effort expectancy, social influence, Habit, Hedonic motivation
Trust integration	Absent (requires extension)	Partial (via attitude)	Absent (requires extension)
Risk integration	Absent (requires extension)	Partial (via PBC)	Absent (requires extension)
Cultural variables	None	Subjective norms (partial)	Social influence, Habit
Emerging market validity	Moderate validated in limited contexts	Moderate Tested in Morocco (El Haraoui & Khatori, 2015)	Low Rarely applied in MENA/Africa
FMCG applicability	Low Designed for tech adoption	Medium Captures cultural habituation barrier	Medium Habit construct relevant
Key limitation in Moroccan FMCG context	Ignores institutional trust deficit and cultural inertia	Unidimensional attitude; no affective-cognitive split	Under-applied; no trust-risk integration in FMCG

Source: Compiled by the authors based on Davis, F. D. (1989). Ajzen, I. (1991). Venkatesh, V., Thong, J. Y. L., and Xu, X. (2012). Pavlou, P. A. (2003). El Haraoui, I. and Khatori, Y. (2015). Bercheq, A., Oukarfi, S., and Jamal, Y. (2020).

3. Digital Trust and Perceived Risk in Online Payment Contexts

3.1. The Multi-Dimensional Structure of Digital Trust

From the 52 reviewed articles, digital trust is developed as a four-level construct in line with the Chouk and Perrien (2004) framework, namely the site, vendor, consumer, and institutional context levels.

- ❖ **Site level:** perceived site quality (Liu and Arnett, 2000), ease of navigation (Wang and Emurian, 2004), professional design (Lumsden and Mackay, 2006), visibility of security signals, and information coherence (McKnight et al., 2002). Site-level antecedents work via first impression mechanisms, which are most powerful for first-time visitors, the highest-risk moment in the FMCG trust formation cycle.

- ❖ **Vendor level:** perceived reputation (Jarvenpaa et al., 2000; McKnight et al., 2001), perceived size (Doney and Cannon, 1997), integrity and benevolence (Mayer et al., 1995; Morgan and Hunt, 1994), delivery reliability, and after-sales service quality. Bercheq et al. (2020) confirm that fear of 'not being reimbursed' and 'not being delivered' are among the most frequently cited trust barriers for Moroccan FMCG online buyers.
- ❖ **Consumer level:** propensity to trust (Gefen, 2000; Lee and Turban, 2001), digital familiarity (McKnight et al., 2002), and prior online purchase experience (Pavlou, 2003). Consumer-level variables are consistently underweighted in models targeting first-time buyers a structural problem for FMCG markets seeking to expand online customer bases.
- ❖ **Institutional level:** structural assurance (McKnight et al., 2002) is consumers' belief that regulatory frameworks and financial protection systems will work reliably if something goes wrong. In Morocco, the perceived institutional deficit increases all other trust barriers.

3.2. Dimensions of Perceived Risk in FMCG Online Payment

Across 38 of the 52 articles reviewed, four dimensions are consistently identified:

- ❖ **Financial risk:** loss of money due to fraud, unauthorized use of credentials, or failure to receive a refund. The most studied and most influential dimension of all time. CMI data support progressive improvements in security, but Bercheq et al. (2020) show that perceptual changes in consumer confidence have not yet kept pace with technical developments.
- ❖ **Product risk:** physical product not matching digital product representation, freshness failures, quality inconsistencies, counterfeit risk. The most FMCG-specific risk dimension and the one most systematically undertheorised in existing models. Forsythe and Shi (2003) found that product risk is a more important predictor of non-patronage for sensory-evaluation-dependent categories.
- ❖ **Privacy/information risk:** risk that personal data, payment credentials and purchase history are misused. This is foundational, as established by Belanger et al. (2002) and Hoffman et al. (1999). Most influential in the first-transaction stage and for users with a low digital exposure.

- ❖ **Temporal risk:** delays in delivery, delays in refund processing, and complexity of return logistics. Especially critical in the FMCG, where the need for a product is often immediate, and the delay in delivery turns a convenience advantage into a functional disadvantage.

3.3. The Trust-Risk Interaction: Beyond the Simple Inverse Model

The prevailing model considers trust as a moderator of perceived risk (Pavlou, 2003; Chouk and Perrien, 2005). Or Chang and Fang (2013) propose that trust and distrust function as independent constructs and influence purchase intention directly, not via a single mediation path. In this model, trust-building and risk-reduction are not synonymous strategic goals. When consumers have high environmental risk perceptions regarding payment infrastructure security, strategies based solely on trust signals at the vendor level may be insufficient in Moroccan FMCG e-commerce, and vice versa. The theoretical complexity is handled by the integrative model discussed in Section 5.

3.4. The Layered Trust Model: An Original Contribution for FMCG E-Commerce

The systematic review indicates a theoretical gap that standard trust models utilising either the concept of discrete stages (Gefen, 2000) or tiered classifications (Chouk and Perrien, 2004) tend to overlook: in FMCG e-commerce, consumer trust involves not a uni-dimensional evaluative judgement but instead a progressive, layered resolution journey. A shopper who buys fresh produce, personal care, or household products online must simultaneously commit to resolving trust uncertainties at three analytically distinct layers, and a failure at any one of them is sufficient to abort the purchase even when the other two are fully resolved.

The Layered Trust model posits that trust formation in FMCG online purchasing is conjunctive, meaning all three layers must attain a sufficient threshold before purchase intention is triggered. This contrasts with the linear trust-risk-intention chain theorised in TAM extensions (Pavlou, 2003) and multi-level antecedent frameworks (Chouk and Perrien, 2004). This conjunctive logic differentiates FMCG trust from the compensatory trust logic relevant to durable goods, in which high trust in one dimension (e.g., vendor reputation) can compensate for lower trust in another (e.g., site quality).

Table N°4: The Layered Trust Model

Three Simultaneous Trust Resolution Requirements in FMCG Online Purchasing

Trust Layer	Consumer Question	Perceived Risk Dimensions	FMCG Platform Response
Layer: Payment Trust	Will my transaction be financially secure? Will my credentials be protected?	Financial risk; Privacy/informational risk	3D-Secure, HTTPS, privacy policy visibility, mobile wallet adoption
Layer 2: Product Trust	Will the item I receive match what I see online? Is it fresh, authentic, undamaged?	Product risk; Sensory evaluation gap	Quality certification, user-generated visual content, ingredient transparency, 360° product views
Layer 3: Logistics Trust	Will it arrive on time and in usable condition? Will I be reimbursed if something goes wrong?	Temporal risk; Financial risk (refund)	Real-time delivery tracking, instant refund policy, return-without-justification guarantee for perishables

Source: Authors' own theoretical construct, drawing on Chouk, I. and Perrien, J. (2004). Pavlou, P. A. (2003). Forsythe, S. and Shi, B. (2003). Belanger, F., Hiller, J. S., and Smith, W. J. (2002). Bercheq, A., Ouakri, S., and Jamal, Y. (2020).

The Layered Trust model makes a specific empirical prediction: interventions that address only one layer of trust will have much weaker adoption effects than those that address multiple layers. A platform with 3D-Secure authentication (Layer 1) but not product quality certification (Layer 2) and explicit delivery SLAs (Layer 3) will only produce partial trust, not enough to reach the total level needed for a first purchase. This prediction is a theoretical contribution that stands independent of any companion empirical paper, and is directly testable in a factorial experimental design.

4. The Moroccan FMCG Digital Context

4.1. Digital Infrastructure, Payment Ecosystem, and Fintech Dynamics

E-payments in Morocco have evolved significantly from 2020 to 2024. According to the Centre Monétique Interbancaire (CMI, 2023), online card transactions increased from 31 billion MAD in 2022 to 38 billion MAD in 2023, an 18% annual increase, while active payment terminals surpassed 120,000 by end-2023. Banking penetration stood at 82% of the adult population, compared with 48% in 2010, driven mainly by mobile banking and the progressive rollout of m-wallet solutions authorised under the 2017 e-payment liberalisation framework (Bank Al-Maghrib, 2023).

But these gains in infrastructure have not been matched by a corresponding increase in consumer take-up. FMCG penetration is far below the estimated 18% of Moroccan households buying online on a regular basis (Haut-Commissariat au Plan (HCP, 2023). More tellingly, active mobile wallet usage is still below 30% of registered holders (Bank Al-Maghrib, 2023),

which means that most consumers who registered have not converted that step into habitual transactional behaviour. This gap between registration and use is exactly what UTAUT2 theorizes as the role of habit in technology adoption (Venkatesh et al., 2012) and what El Haraoui and Khatori (2015) empirically identify as the cultural habituation barrier: offline purchasing routines that infrastructure investment alone cannot dislodge.

Fintech developments add more analytical dimensions. Mobile wallets, by decoupling the payment process from the direct disclosure of credentials, reduce the financial risk at the payment layer in a structural manner. Turedi and Yildiz’s (2023) systematic review has found that mobile wallet adoption decreases financial risk perception by an average of 34% compared to card interfaces – direct empirical basis for hypothesis H8. The open banking, in regulatory development by Bank Al-Maghrib, will have a double trust effect: a decrease of the transactional friction on one hand and an increase of the concerns related to the sharing of data on the other, a dynamic consistent with the European evidence (Ryu, 2018; Stewart and Jürjens, 2018) whose net result in the Moroccan context remains an open empirical question.

4.2. Evolution of Morocco's Digital Payment Regulatory Framework (2007–2024)

To argue that Moroccan consumers suffer from a perceived institutional deficit a gap between the existence of consumer protection mechanisms and consumer awareness of those mechanisms must be situated within the actual regulatory trajectory.

Table N°5: Morocco's Digital Payment Regulatory Timeline and Trust Implications (2007–2024)

Year	Regulatory Event / Development	Trust Implication for FMCG E-Commerce
2007	Law 09-08	Personal data protection, established legal basis for digital data rights in Morocco
2011	CNDP created	“Commission Nationale de contrôle de la Protection des Données à caractère Personnel” becomes operational
2011	Law 31-08	Consumer protection measures, first legislative framework covering online commercial disputes
2017	Bank Al-Maghrib e-payment liberalisation	Mobile wallets (m-wallets) officially authorised; new payment service providers enter the market
2020	CMI, 3D-Secure v2 deployment	Enhanced authentication for online card payments; structural reduction in credential fraud exposure
2021–2023	HCP household digitalisation surveys	Documented gap between internet access (>80% urban) and e-commerce adoption (<20% households)
2024	Open banking framework	Under development by Bank Al-Maghrib; third-party payment service providers gaining conditional API access to account data

Source: Compiled by the authors based on: *Bulletin Officiel*, n° 5744 (2009). n° 5932. (2011). (CNDP). (2011). *Rapport annuel d'activité*. Bank Al-Maghrib. (2017). (CMI). (2022). *Rapport annuel*. Plan (HCP). (2023).

The regulatory timeline shows a structural dynamic that the trust literature has not yet theorized for the Moroccan context: regulatory progress is ahead of perceptual uptake by several years. Structural risk reduction measures such as the implementation of 3D-Secure in 2020 and the authorisation of m-wallets in 2017 have not yet resulted in corresponding reductions in consumer-reported financial risk concerns at the time of the survey of Bercheq et al. (2020). This perception lag phenomenon where investment in trust-building at the institutional level does not have immediate consumer-level trust effects is a specific theoretical and managerial challenge that distinguishes Morocco from more digitally mature markets where the perception-regulation gap is smaller.

4.3. FMCG-Specific Trust Dynamics: The Sensory Evaluation Gap

We propose the concept of the **sensory evaluation gap** as the structural deficit in consumer trust-forming capacity that arises when product categories typically chosen through sensory inspection fresh food, cosmetics, personal care are transferred to digital channels that cannot replicate the olfactory, tactile, or visual cues on which selection decisions rely.

This is not simply a practical inconvenience, but an obstacle to trust formation at the product level, analytically distinct from vendor-level or institutional-level trust concerns. The consumer may have every confidence in the vendor's reliability of delivery and security of payment, but may not be able to clear enough doubt about the quality of the product to make a purchase commitment. So, FMCG platforms must build trust tools adapted to the uncertainty of the product: ingredient and nutritional transparency, user-generated visual content, quality certification labels, and return-without-justification guarantees for perishables.

4.4. Consumer Profiles and the Second-Order Digital Divide

Bercheq et al. (2020) identify three types of consumers: confident cyber-consumers (buy without hesitation), mistrustful cyber-consumers (buy with active risk monitoring), and e-commerce non-consumers (reject e-commerce). The non-consumer profile is particularly relevant to the second-order digital divide (Hargittai, 2002) inequalities in technology use rather than simply access: people who may have internet access but do not have the cognitive and cultural resources to translate access into productive digital commercial engagement. Thus, trust-building strategies have to be segment-specific, and cannot rely on a single, universal approach.

4.5. African and MENA Empirical Evidence: A Synthesis

The revised search strategy of the systematic review (now ‘MENA’ and ‘Africa’ are explicit search terms in String 2) identified seven recent empirical studies that validate or build on the theoretical claims of this article. These studies were not in earlier versions and are included to address the reviewer’s comment on the lack of grounding in African and MENA empirical literature:

Table N°6: Recent African and MENA Empirical Studies Supporting the Theoretical Framework

Study	Context	Relevant Finding for Present Framework
Zniti & Souissi (2022)	Morocco	Structural equation modeling of e-payment adoption barriers among Moroccan SME owners: security perception and institutional trust emerge as primary inhibitors, outweighing usefulness assessments directly corroborating the trust-infrastructure paradox framework.
Iddouch et al. (2023)	Morocco	Empirical survey (n=380) on mobile wallet adoption among Moroccan millennials: perceived financial risk and privacy concern are significant negative predictors of m-wallet usage intention, consistent with the financial risk salience hypothesis (H5).
Abubakar et al. (2022)	Nigeria	TAM-trust integration study in Nigerian FMCG e-commerce: vendor reputation and third-party certification are stronger trust predictors than site quality, supporting H2 and H4 and demonstrating cross-market validity within the African context.
Tarhini et al. (2021)	MENA region	A multi-country UTAUT2 study across six MENA countries finds that habit and social influence are dominant predictors of mobile commerce adoption, confirming the cultural habituation barrier identified in the Moroccan literature (El Haraoui and Khatori, 2015).
Boateng et al. (2021)	Ghana	Qualitative study of FMCG online purchasing barriers in urban Ghana: sensory evaluation inability and delivery unreliability are primary adoption inhibitors, independently validating the Layered Trust model's Layer 2 and Layer 3 constructs.
Turedi & Yildiz (2023)	Turkey / MENA	Systematic review of fintech trust in emerging markets: mobile wallet adoption reduces financial risk perception by 34% on average compared to card payment interfaces empirical support for H8 and the credential-decoupling mechanism.
Sabi et al. (2018)	Sub-Saharan Africa	Systematic review of e-commerce adoption barriers across 14 sub-Saharan African countries: institutional trust deficit and weak regulatory frameworks consistently emerge as structural barriers to adoption, independent of individual-level trust antecedents — supporting the perceived institutional deficit construct.

Source: Authors' compilation. Studies selected from the systematic review corpus (n = 52); all meet four or more quality assessment criteria at the 'Required' threshold.

This African and MENA evidence base shows three convergent findings. Firstly, the

institutional trust deficit the gap between the existence of regulation and consumer-perceived protection is a primary adoption barrier in Morocco, Nigeria, and sub-Saharan Africa, regardless of the individual-level trust antecedents. Second, vendor reputation and third-party certification consistently outperform site quality as predictors of trust in weak-regulation emerging markets, thereby validating H2 and H4 across multiple African contexts. Third, the use of mobile wallets helps greatly reduce the perceived financial risk in MENA fintech contexts. This result empirically validates H8, which had previously been supported only by evidence from Europe.

5. Integrative Conceptual Model and Research Hypotheses

5.1. Model Architecture

The integrative conceptual model draws on the TAM (Davis, 1989), TPB (Ajzen, 1991), UTAUT2 (Venkatesh et al., 2012), the Chouk-Perrien trust framework (2004), and the perceived risk literature (Pavlou, 2003; Chang and Fang, 2013). It is structured around four analytical levels:

Exogenous variables, Trust antecedents:

- Perceived site quality (ergonomics, design, information coherence)
- Perceived vendor reputation (brand recognition, review aggregates)
- Security and privacy perception (HTTPS, 3D-Secure, privacy policy clarity)
- Third-party certification (trust labels, CNDP authorisation, regulatory compliance)
- Mobile wallet adoption (availability of credential-free payment options)

Mediating constructs:

- Digital trust (composite: cognitive trust + affective trust)
- Perceived risk (composite: financial + product + privacy + temporal)
- Perceived usefulness and Perceived ease of use (TAM)
- Attitude toward online FMCG purchasing (TPB)

Moderating variables:

- Purchasing culture orientation (preference for sensory evaluation, negotiation, physical presence)
- Digital familiarity and prior online purchase experience (UTAUT2: habit)
- Dispositional trust propensity (consumer-level variable)

5.2. Research Hypotheses

Table N°7: Hypotheses

Hyp.	Statement
H1	Perceived site quality has a significant positive effect on digital trust toward FMCG online vendors.
H2	Perceived vendor reputation has a significant positive effect on digital trust, and this effect is stronger than the effect of perceived site quality among Moroccan FMCG consumers.
H3	Security and privacy perception has a significant negative effect on financial risk perception, which in turn negatively affects online payment intention.
H4	Digital trust fully mediates the relationship between third-party certification and online payment intention.
H5	Financial risk perception has a stronger negative effect on online payment intention than product risk or privacy risk perception among Moroccan FMCG consumers.
H6	Perceived ease of use moderates the trust-intention relationship, such that the positive effect of trust is attenuated among consumers with low digital familiarity.
H7	Purchasing culture orientation negatively moderates the trust-intention relationship, attenuating it among consumers with high preference for physical purchasing.
H8	Mobile wallet adoption is negatively associated with financial risk perception, partially mediating the effect of security infrastructure on digital trust.
H9	Dispositional trust propensity positively moderates the vendor reputation-trust relationship, with its effect strongest among first-time online buyers.
H10	Digital trust and perceived risk have independent and additive effects on online payment intention (Chang and Fang, 2013 distinction between trust and distrust as non-redundant constructs).

5.3. Segment-Specific Trust-Repair Strategies for FMCG Online Platforms

Bercheq et al. (2020) identified three consumer profiles: confident cyber-consumers, mistrustful cyber-consumers and non-consumers. These three consumer profiles face fundamentally different trust barriers and thus require fundamentally different trust-repair strategies. Standard platform approaches that apply uniform security communication across all segments not only waste resources but risk generating trust-backfire effects: consumers who have already resolved trust concerns at one layer may interpret excessive security communication as a signal that the platform itself considers the transaction risky, paradoxically increasing rather than reducing risk perception.

Table N°8: Segment-Specific Trust-Repair Strategies for Moroccan FMCG Online Platforms

Consumer Profile (Bercheq et al., 2020)	Primary Barrier	Trust-Repair / Adoption Strategy
Confident cyber-consumer	None (trust already established)	Loyalty programmes, personalisation algorithms, cross-category FMCG bundling, subscription replenishment models
Mistrustful cyber-consumer	Financial & privacy risk; Residual product risk	Visible 3D-Secure authentication, real-time delivery tracking, instant refund policy, after-sale service quality signalling
Non-consumer	Cultural habituation barrier + digital literacy deficit + banking access gap	Mobile wallet onboarding simplification, first-purchase money-back guarantee, 360° product views, community testimonials in local dialect, cash-on-delivery hybrid option

Source: Authors' synthesis based on Bercheq, A., Oukarfi, S., and Jamal, Y. (2020). Chouk, I. and Perrien, J. (2005). Chang, Y. S. and Fang, S. R. (2013). Ganguly, R., Dash, S. R., Cyr, D., and Head, M. (2010).

One important implication of the typology concerns the sequencing of trust investments. The most attractive segment for trust-building investment in FMCG platforms entering the Moroccan market is the mistrustful cyber-consumer group: these consumers have already surmounted the hurdles of access and competence, and are willing to buy online, but their residual risk vigilance constrains basket size, purchase frequency and product category expansion. This is the segment where targeted interventions at Layers 1 and 3 of the Layered Trust models (payment security and logistics reliability) are predicted to have the highest marginal impact on conversion rates.

Conclusion

This article has presented a PRISMA-compliant systematic review of digital trust and perceived risk as determinants of online payment behaviour in the FMCG sector within the Moroccan context. The systematic selection and critical analysis of 52 peer-reviewed publications has produced three principal theoretical contributions.

The **first** is the identification of three underexplored theoretical tensions: the insufficiently theorised relationship between dispositional and institutional trust in weak-regulation contexts; the inadequate conceptualisation of FMCG-specific product risk (the sensory evaluation gap); and the near-complete absence of research integrating fintech innovations mobile wallets and open banking into trust formation models for everyday consumer goods. These gaps collectively define the scientific contribution space that the proposed conceptual model occupies.

The **second** is a critical reassessment of dominant theoretical frameworks. The TAM, TPB, and UTAUT2 each capture important but partial dimensions of the trust-risk-adoption dynamic, and their individual limitations justify integration rather than individual deployment. This paper shows that these limitations are particularly relevant in the Moroccan FMCG context, as the exclusion of institutional trust deficiencies in the TAM, the one-dimensional attitude construct in the TPB, and the limited use of UTAUT2 in emerging-market FMCG studies lead to a theoretical void that the integrative model begins to address.

The **third** is an integrative conceptual model with ten empirically testable hypotheses, situated in a positivist paradigm and aimed at validation through structural equation modeling on a representative sample of Moroccan FMCG consumers.

Limitations are: the corpus is still subject to publication bias, and trust barriers specific to the FMCG context in Morocco may be under-theorized in English-language journals; the model is not yet empirically tested; and supply-side dynamics – platform strategy, vendor trust investment, regulatory design are a complementary research domain not tackled here.

Future research perspectives: (1) empirical validation of the proposed model by SEM, (2) comparative studies in Maghreb and sub-Saharan African markets, (3) experimental studies to separate the impact of the availability of mobile wallets on the perception of financial risk, (4) qualitative study of the cultural habituation barrier, and (5) longitudinal study of the dynamics of trust accumulation in the context of repeat online purchases of FMCG.

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