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IMPACT OF E-COMMERCE INFORMALITY ON CONSUMER TRUST AND LOYALTY: EMPIRICAL EVIDENCE IN EMERGING MARKETS

IMPACTO DE LA INFORMALIDAD DEL COMERCIO ELECTRÓNICO EN LA CONFIANZA Y LEALTAD DEL CONSUMIDOR: EVIDENCIA EMPÍRICA EN MERCADOS EMERGENTES

Rafael Emiliano Apolinario Quintana[1*]
Email: rafael.apolinarioqu@ug.edu.ec
ORCID: https://orcid.org/0000-0003-1719-5425
Oscar David Jaramillo Burgos[2]
Email: ojaramillo@pucp.edu.pe
ORCID: https://orcid.org/0009-0000-1519-5451
Fernando Francisco Bocca Ruiz[1]
Email: fernando.boccar@ug.edu.ec
ORCID: https://orcid.org/0009-0003-9433-4449
Mónica Annabel Caicedo Leones[1]
Email: monica.caicedol@ug.edu.ec
ORCID: https://orcid.org/0000-0002-1986-2992
Martha Graciela Rodríguez Donoso[1]
Email: martha.rodriguezd@ug.edu.ec
ORCID: https://orcid.org/0000-0001-5774-7760
[1]Universidad de Guayaquil, Guayaquil, Ecuador.
[2]Pontificia Universidad Católica de Perú, San Miguel, Perú.
*Corresponding author

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ABSTRACT:

The growth of e-commerce has transformed emerging economies, but it has also driven informal practices that operate outside of regulatory frameworks. Despite its expansion, its behavioral effects have been little studied. This paper analyzes how informality in digital platforms influences consumer trust and loyalty, considering the mediating role of trust in an emerging market. Based on the Stimulus-Organism-Response (S-O-R) model, a quantitative approach is employed with data from 354 consumers with recent experience in online shopping. PLS-SEM validates the measurement and structural models. The results show that informality negatively impacts both consumer trust and loyalty. In turn, trust positively influences loyalty and partially mediates the relationship between informality and loyalty. This shows that informal practices generate uncertainty that weakens the building of trust and affects long-term relationships in digital environments. The study contributes to the literature by integrating informality as a central construct and extending the S-O-R framework to informal digital commerce. In addition, it offers evidence from an emerging economy, filling a geographical gap in previous research. Their findings are relevant for platform managers and policymakers aimed at strengthening trust, sustainability and formalization of e-commerce.

Keywords: Informality, E-commerce, Consumer trust, Customer loyalty, Emerging markets.

RESUMEN:

El crecimiento del comercio electrónico ha transformado las economías emergentes, pero también ha impulsado prácticas informales que operan al margen de los marcos regulatorios. A pesar de su expansión, sus efectos conductuales han sido poco estudiados. Este artículo analiza cómo la informalidad en las plataformas digitales influye en la confianza y la lealtad del consumidor, con la consideración del papel mediador de la confianza en un mercado emergente. Con base en el modelo Estímulo-Organismo-Respuesta (S-O-R), se emplea un enfoque cuantitativo con datos de 354 consumidores con experiencia reciente en compras en línea. El PLS-SEM valida los modelos de medición y estructural. Los resultados muestran que la informalidad impacta negativamente tanto en la confianza como en la lealtad del consumidor. A su vez, la confianza influye positivamente en la lealtad y media parcialmente la relación entre la informalidad y la lealtad. Esto demuestra que las prácticas informales generan incertidumbre que debilita la construcción de confianza y afecta las relaciones a largo plazo en entornos digitales. El estudio contribuye a la literatura al integrar la informalidad como un constructo central y extiende el marco S-O-R al comercio digital informal. Además, aporta evidencia desde una economía emergente, además llena un vacío geográfico en investigaciones previas. Sus hallazgos son relevantes para los gestores de plataformas y los responsables de políticas orientadas a fortalecer la confianza, la sostenibilidad y la formalización del comercio electrónico.

Palabras clave: Informalidad, Comercio electrónico, Confianza del consumidor, Lealtad del cliente, Mercados emergentes.

INTRODUCTION

The expansion of e-commerce has transformed the dynamics of global trade by reducing transaction costs, removing geographical barriers, and allowing businesses, especially small and medium-sized enterprises, to access international markets more efficiently. In recent years, and especially after the COVID-19 pandemic, e-commerce has become a strategic pillar of economic development and international trade, accelerating digital adoption and transforming consumer purchasing behavior (Santamaría-Mendoza et al., 2024). In emerging economies, this transformation has been particularly pronounced, as digital platforms have offered new opportunities for market participation with relatively low barriers to entry.

However, alongside its rapid expansion, e-commerce has also facilitated the proliferation of informal business practices. Informality in digital markets often manifests itself through tax evasion, lack of business registration, absence of consumer protection mechanisms, limited product traceability, and weak after-sales services, generating an environment characterized by regulatory ambiguity and increased risk for the consumer (Becerra et al., 2023; Briones-Morales & Bailón-Lourido, 2022). The absence of clear and enforceable regulatory frameworks has allowed a significant portion of online transactions to operate outside formal institutional controls, undermining transparency and fair competition.

This phenomenon is not exclusive to Ecuador or Latin America (Icaza & Riquero, 2024); however, it tends to intensify in contexts where fiscal supervision and digital regulation remain limited or fragmented (Iqbal et al., 2024). In these environments, informal e-commerce creates unfair competition conditions for legally established companies, weakens tax collection, and exposes consumers to higher levels of fraud and uncertainty. Empirical evidence indicates that informal practices in digital markets negatively affect market confidence and compromise the long-term sustainability of e-commerce ecosystems (Becerra et al., 2023).

Consumer trust plays a central role in the success of e-commerce platforms. Previous studies emphasize that trust is a fundamental determinant of customer loyalty, repeat purchase behavior, and the building of long-term relationships in digital environments. When consumers perceive high levels of uncertainty, such as a lack of guarantees, insecure payment methods, or poor after-sales support, their willingness to make recurring transactions decreases substantially, weakening the loyalty and sustainability of the platform (Erdal & Kaya, 2023). In informal e-commerce environments, these trust-eroding conditions are more prevalent and directly affect consumers' perception of security and trustworthiness (Madhivanan et al., 2025).

The relevance of consumer loyalty goes beyond performance at the enterprise level, as it is a strategic factor for successful integration into international digital commerce. Platforms capable of fostering long-lasting relationships with consumers tend to strengthen their competitive positioning, expand cross-border operations, and increase national participation in global markets (Suominen, 2019). On the contrary, persistent informality undermines these opportunities by eroding institutional credibility and limiting the development of trustworthy digital commerce environments (Briones-Morales & Bailón-Lourido, 2022).

Despite the growing academic interest in e-commerce trust and loyalty, the role of informality as a structural determinant of consumer behavior remains underexplored in the high-impact international literature. Existing studies focus primarily on formal and highly regulated digital markets, overlooking the behavioral implications of informal institutional contexts, especially in emerging economies (Erdal & Kaya, 2023). This gap limits the explanatory power of current models when applied to informal digital ecosystems (Ernst & Leung, 2023).

In response to this shortcoming, this study analyzes the impact of e-commerce informality on consumer loyalty, examining the mediating role of consumer confidence in the context of an emerging economy (Nasti et al., 2024). By integrating informality into a Stimulus–Organism–Response (S-O-R) framework, this research seeks to provide empirical evidence on how institutional deficiencies translate into psychological assessments and behavioral outcomes in digital markets (Estanque & Climent, 2023). The study contributes to the literature by offering a structured analysis of the informal dynamics of e-commerce and generating relevant knowledge for academics, platform managers, and policymakers seeking to strengthen trust and sustainability in digital commerce.

Informality in e-commerce

Informality has long been recognized as a structural feature of emerging economies, traditionally associated with unregulated labor markets and informal retail activities (Estanque & Climent, 2023). With the expansion of digital technologies, informality has increasingly migrated to online environments, giving rise to what recent studies describe as digital or platform-based informality (Once & Suasti, 2024). In the context of e-commerce, informality refers to business practices carried out outside formal regulatory frameworks, including the absence of tax compliance, lack of business registration, weak consumer protection mechanisms, and limited transparency in transactions.

The digitization of commerce has lowered barriers to entry for sellers, allowing individuals and small businesses to participate in online commerce with minimal institutional oversight. While this has broadened economic participation, it has also facilitated the proliferation of informal vendors operating through unregistered social media platforms and online marketplaces (Nasty et al., 2024). Previous research suggests that weak regulatory enforcement and limited fiscal oversight in emerging markets exacerbate this phenomenon, allowing informal e-commerce to coexist and compete with formal digital businesses.

Empirical evidence indicates that informal digital practices generate negative externalities for market efficiency and sustainability. These include unfair competition, losses in tax revenues, and increased consumer exposure to fraud and low-quality products (Pilatti et al., 2023). However, despite the growing recognition of the informality of e-commerce as a systemic challenge, its behavioral consequences for consumers, especially in terms of trust and loyalty formation, remain insufficiently examined in the international literature.

Consumer trust in digital platforms

Consumer trust is widely considered to be a cornerstone of successful relationships in e-commerce. In online environments characterized by information asymmetry and physical distance, trust functions as a mechanism that reduces perceived risk and uncertainty. Trust reflects consumers' beliefs about the seller's competence, integrity, and benevolence, and plays a critical role in shaping purchase intentions and post-purchase behavior.

Extensive research shows that trust positively influences consumers' willingness to transact online, their satisfaction with digital platforms, and their likelihood of making repeat purchases (Fernandes et al., 2021). In formal e-commerce environments, trust is often fostered through secure payment systems, transparent policies, reliable logistics, and institutional safeguards such as dispute resolution mechanisms (Apolinario & Guevara, 2021).

In contrast, informal e-commerce environments often lack these trust-reinforcing structures. The absence of legal responsibility, standardized guarantees, and transparent information can increase consumers' perception of risk, thus weakening trust. Although some studies recognize the presence of trust in contexts of peer-to-peer exchange and social commerce, trust in informal settings is often relational and fragile, making it vulnerable to negative experiences and opportunistic behaviors (Becerra et al., 2023).

Consumer loyalty in e-commerce

Consumer loyalty in e-commerce refers to the customer's intention to maintain a long-term relationship with a seller or digital platform, manifested through repeat purchases, positive word-of-mouth, and resistance to switching alternatives. Loyalty is especially valuable in digital markets, where acquisition costs are high and competition is intense (Briones-Morales & Bailón-Lourido, 2022; Ernst & Leung, 2023).

Previous studies consistently identify trust as a key antecedent of e-loyalty Portalanza et al. 2024). Trust reduces uncertainty, increases satisfaction, and strengthens emotional attachment, all of which contribute to long-lasting consumer relationships (Erdal & Kaya, 2023). In formal digital environments, loyalty is reinforced through consistent service quality, personalized experiences, and reliable post-sale support (Dimitrieska, 2024; Ernst & Leung, 2023).

However, the dynamics of loyaly formation in informal e-commerce contexts remain unclear (Judijanto et al., 2024). Informal vendors can attract consumers through lower prices or convenience, but the lack of institutional safeguards can undermine long-term loyalty. This suggests that while informal e-commerce may be successful in generating initial transactions, it may struggle to maintain long-lasting relationships with the consumer (Madhivanan et al., 2025; Suominen, 2019).

Theoretical framework

Stimulus-organism-response (S-O-R)

To explain how informality affects consumer behavior in e-commerce, this study adopts the Stimulus-Organism-Response (S-O-R) framework (Yu et al., 2024). Originally developed in environmental psychology, the S-O-R model posits that external stimuli influence people's internal cognitive and emotional states, which in turn shape behavioral responses.

In the context of this study, the informality of e-commerce represents the stimulus, characterized by the absence of regulation, the lack of transparency, and the perception of illegitimacy. Consumer trust functions as the body, reflecting consumers' internal risk and reliability assessments (Becerra et al., 2023). Consumer loyalty constitutes the answer, capturing behavioral intentions related to repeat purchases and long-term engagement (Erdal & Kaya, 2023).

The S-O-R framework is particularly suitable for examining informal digital markets, as it allows for the integration of structural market conditions with psychological processes that drive consumer behavior (Yu et al., 2024. By positioning trust as a mediating mechanism, the model offers a coherent theoretical explanation of how informality undermines loyalty in e-commerce environments (De la Vega et al., 2021).

Informal e-commerce practices increase uncertainty by limiting transparency, accountability, and consumer protection. As a result, consumers may perceive greater risks when interacting with informal vendors, leading to lower levels of trust.

H1: The informality of e-commerce has a negative effect on consumer confidence.

Trust reduces perceived risk and increases consumer confidence in digital transactions. When consumers trust a seller or online platform, they are more likely to make repeat purchases and develop long-term loyalty.

H2: Consumer trust has a positive effect on consumer loyalty on e-commerce platforms.

Beyond its indirect effect through trust, informality can directly affect loyalty by discouraging repeat interaction due to negative experiences or uncertainty about future transactions.

H3: The informality of e-commerce has a negative effect on consumer loyalty.

The S-O-R frame. suggests that the effect of informality on loyalty operates mainly through internal psychological mechanisms. Trust acts as a key mediator by linking informal practices with consumer responses.

H4: Consumer trust mediates the relationship between the informality of e-commerce and consumer loyalty.

MATERIALS AND METHODS

Methodology

This study adopts a quantitative research design with a cross-sectional approach to examine the relationships between e-commerce informality, consumer trust, and consumer loyalty). A survey-based methodology was used to collect primary data from people with previous experience in online shopping. This design is suitable for testing causal relationships between latent constructs and for validating theoretical models in consumer behavior research.

The data was collected through an online questionnaire administered to consumers who had made at least one online purchase in the past six months. The study focused on an emerging market context, where informal e-commerce practices are predominant. A non-probabilistic sampling method based on convenience and snowball techniques was used, common in exploratory studies and theoretical tests in digital commerce research.

A total of 354 valid responses were obtained after data screening and the elimination of incomplete questionnaires. The sample size exceeds the minimum requirements for Partial Least Squares Structural Equation Modeling (PLS-SEM), following the "10-fold rule" and recent recommendations for statistical power in structural models.

The informality of e-commerce was measured using a multi-item scale adapted to previous studies on informal economic activities and digital trade. The concept captures consumers' perceptions of regulatory non-compliance, lack of transparency, absence of formal safeguards, and weak consumer protection mechanisms in online transactions. All items were measured using a five-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree").

Consumer confidence was measured using a validated scale widely applied in e-commerce research, reflecting consumers' beliefs about the integrity, trustworthiness and competence of online sellers or platforms. The items were adapted from studies established in the digital trust literature, and measured on a five-point Likert scale.

Consumer loyalty was operationalized as a reflexive construct that captures consumers' intent to make repeat purchases, recommend the platform to others, and maintain a long-term relationship with the seller. The scale was adapted from previous research on e-loyalty and measured using a five-point Likert scale.

To mitigate common bias in the method, several procedural remedies were implemented, including ensuring respondents' anonymity, varying item wording, and reducing apprehension by assessment. In addition, Harman's single-factor test was performed, indicating that no one factor explained most of the variance, suggesting that common method bias is probably not a significant concern in this study.

Partial Least Squares Structural Equation Modeling (PLS-SEM) was used to test the proposed research model and hypotheses, using SmartPLS software. PLS-SEM is suitable for this study due to its ability to handle complex models with multiple latent constructs, its robustness with non-normal data, and its suitability for exploratory and theoretical extension investigations.

The analysis followed a two-step approach. First, the measurement model was evaluated by examining the reliability of internal consistency, convergent validity, and discriminant validity. Second, the structural model was evaluated by analyzing path coefficients, coefficients of determination (R^2), effect sizes (f^2), and predictive relevance (Q^2).

The reliability of internal consistency was assessed using Cronbach's alpha and composite reliability (CR), with values exceeding the recommended threshold of 0.70. Convergent validity was evaluated using the extracted mean variance (AVE), ensuring values greater than 0.50. Discriminant validity was examined using the Fornell–Larcker criterion and the heterotrait–monotrait ratio (HTMT).

The structural model was evaluated by examining the importance of the road coefficients using a start-up procedure with 5,000 redemonstrations. The explanatory power of the model was assessed using R^2 values, while effect sizes (f^2) were calculated to determine the relative impact of each exogenous construct. Predictive relevance was evaluated using the blind-bandage procedure to obtain Q^2 values.

RESULTS- DISCUSSION

A total of 384 responses were initially collected through the online survey. After data screening procedures, including the elimination of incomplete questionnaires, linear response patterns and inconsistent responses, 354 valid responses were retained for the final analysis. This sample size is suitable for PLS-SEM and exceeds the recommended thresholds for statistical power in structural equation modeling.

The final sample (n=384) is composed of active online consumers with recent experience in e-commerce transactions. Respondents exhibit diverse demographics and a high level of familiarity with digital shopping environments, confirming the suitability of the sample to examine consumer trust and loyalty on e-commerce platforms.

Measurement Model Results

All constructs demonstrate strong internal consistency, with Cronbach's alpha and CR values exceeding the recommended threshold of 0.70 (table 1). The AVE values are above 0.50 for all constructs, which confirms satisfactory convergent validity.

Table 1. Reliability and convergent validity (n = 354).

Construct	Cronbach's Alpha	Composite reliability (CR)	AVE
Informality of e-commerce	0.871	0.907	0.663
Consumer confidence	0.892	0.924	0.708
Consumer loyalty	0.876	0.915	0.689

Discriminant validity

Discriminant validity is confirmed, since the square roots of AVE exceed the correlations between constructs and all HTMT (table 2) values are below the conservative threshold of 0.85.

Table 2. HTMT Ratio

Constructs	HTMT
Informality – Trust	0.58
Informality – Loyalty	0.51
Trust – Loyalty	0.72

Results of the structural model

The values of the variance inflation factor (VIF) ranged from 1.18 to 1.76, indicating that there are no multicollinearity problems in the structural model.

The results (table 3) indicate that the informality of e-commerce has a significant and negative effect on consumer confidence ($\beta = -0.501$, $p < 0.001$), supporting H1. Consumer confidence positively influences consumer loyalty ($\beta = 0.623$, $p < 0.001$), supporting H2. In addition, the informality of e-commerce exerts a significant direct negative effect on consumer loyalty ($\beta = -0.207$, $p < 0.001$), supported H3.

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Table 3. Structural path coefficients (Bootstrapping of 5,000 resampling).

Hypothesis	Path	b	t-value	p-value	Result
H1	Informality → Trust	–0,501	11.84	< 0.001	Supported
H2	Trust → loyalty	0.623	15.92	< 0.001	Supported
H3	Informality → loyalty	–0,207	4.96	< 0.001	Supported

Analysis of mediation

The indirect effect of e-commerce informality on consumer loyalty through consumer trust is statistically significant (table 4). As both direct and indirect effects remain significant, consumer confidence partially mediates the relationship between e-commerce informality and consumer loyalty, thus supporting H4.

Table 4. Indirect effects.

Path	β (Indirect)	T value	P value
Informality → trust → loyalty	–0.312	10.47	< 0.001

Explanatory and predictive power

The model explains 25.1% of the variance in consumer confidence and 46.8% of the variation in consumer loyalty (table 5), indicating moderate to substantial explanatory power, consistent with previous research on e-commerce.

Table 5. Coefficient of Determination (R^2)

Endogenous construct	R^2
Consumer confidence	0.251
Consumer loyalty	0.468

Table 6 presents the effect size (f^2) of the relationships proposed in the model. The results show that Informality has a large effect on Trust with an f^2 value of 0.33. Likewise, Trust has a large effect on Loyalty, with an f^2 value of 0.49, indicating that trust is a strong predictor of customer loyalty. Finally, Informality has a small direct effect on Loyalty, with an f^2 value of 0.06, suggesting that its influence on loyalty is weaker when compared to the effect mediated through trust.

Table 6. Effect size (f^2)

Path	f^2
Informality → Trust	0.33 (large)
Trust → loyalty	0.49 (large)
Informality → loyalty	0.06 (small)

All Q^2 values are above zero (table 7), confirming the predictive relevance of the structural model.

Table 7. Predictive Relevance (Q^2)

Construct	Q^2
Consumer confidence	0.164
Consumer loyalty	0.298

DISCUSSION

This study set out to examine how informality in e-commerce platforms affects consumer trust and loyalty in an emerging market context. The findings provide consistent empirical evidence that informal digital practices undermine consumer trust and consequently weaken long-term consumer loyalty. In addition, the results reveal that consumer trust plays a partial mediating role in the relationship between e-commerce informality and consumer loyalty, highlighting the central role of psychological mechanisms in shaping consumer behavior in informal digital environments.

The negative relationship between e-commerce informality and consumer confidence supports previous research emphasizing the importance of regulatory frameworks, transparency, and institutional safeguards in digital markets.

Although previous studies have focused primarily on formal e-commerce platforms in developed economies, current findings expand this literature by demonstrating that the absence of formal institutional mechanisms in emerging markets significantly increases perceived risk and erodes consumer confidence.

These results suggest that informality introduces a different form of uncertainty that goes beyond traditional online risk factors such as privacy or payment security. In informal e-commerce contexts, consumers are exposed to ambiguous accountability structures and limited recourse mechanisms, which weakens their trust in sellers and platforms. This vision advances the understanding of trust formation by incorporating institutional informality as a critical contextual factor.

In line with the consolidated literature on e-commerce, the findings confirm that consumer trust is a strong predictor of loyalty in digital environments. Trust reduces uncertainty, increases satisfaction, and fosters relational continuity between consumers and online sellers. However, this study contributes to the literature by showing that trust remains a fundamental determinant of loyalty even in informal e-commerce environments, where institutional protections are weak or absent.

The strong effect of trust on loyalty observed in this study underscores the fragility of consumer relationships in informal digital markets. Although informal vendors can attract consumers through lower prices or convenience, the absence of trust-building mechanisms limits the development of sustained consumer loyalty. This finding reinforces the argument that long-term success in e-commerce depends not only on transactional efficiency, but also on institutional credibility and perceived legitimacy.

The mediating role of consumer confidence provides empirical support for the applicability of the Stimulus-Organism-Response (S-O-R) framework in informal digital commerce contexts. By conceptualizing the informality of e-commerce as an external stimulus and consumer confidence as an internal evaluative mechanism, this study demonstrates how structural market conditions translate into behavioral outcomes.

The observed partial mediation suggests that informality affects consumer loyalty both directly and indirectly through trust. This indicates that while trust is a key psychological mechanism, other factors, such as price sensitivity or convenience, can also influence loyalty decisions in informal e-commerce environments. This nuanced understanding contributes to the theory by revealing the complex pathways through which informality shapes consumer behavior.

This study provides several important theoretical contributions. First, it drives e-commerce research by explicitly incorporating informality as a core analytical construct, addressing a notable gap in the literature that has predominantly focused on formal digital markets. Second, by integrating informality into the S-O-R framework, the study offers a theoretically grounded explanation of how institutional conditions influence consumer trust and loyalty. Third, the findings extend the theory of consumer behavior by demonstrating that trust functions as a critical mediating mechanism even in contexts characterized by regulatory weakness and institutional ambiguity.

By providing empirical evidence of an emerging market, this study helps reduce the geographic bias toward developed economies that characterizes much of the existing e-commerce literature. The results underscore the importance of contextualizing theories of consumer behavior to take into account the different levels of institutional development and regulatory application.

Beyond their theoretical implications, the findings offer valuable insights for practitioners and policymakers involved in digital trade. The demonstrated negative effects of informality on trust and loyalty suggest that efforts to promote formalization, transparency, and consumer protection are not only regulatory imperatives, but also strategic necessities to sustain digital markets. These ideas are especially relevant for emerging economies looking to integrate more effectively into international digital trade networks.

CONCLUSIONS

This study examined the effect of e-commerce informality on consumer trust and loyalty in an emerging market context. The findings show that informal digital practices negatively influence both trust and loyalty, confirming that the absence of formal regulation, transparency, consumer protection, and institutional safeguards increases perceived risk and weakens long-term consumer relationships.

The results also confirm the mediating role of consumer trust. Trust partially explains how informality affects loyalty, demonstrating that consumer responses are not only shaped by structural market conditions but also by internal psychological evaluations. From the Stimulus–Organism–Response perspective, informality operates as an external stimulus, trust functions as the evaluative mechanism, and loyalty represents the behavioral outcome.

The study contributes to e-commerce literature by incorporating informality as a central construct in consumer behavior analysis, especially in emerging economies where informal digital transactions are highly relevant. Empirically, the PLS-SEM results provide evidence that sustainable e-commerce requires more than accessibility and low prices; it also depends on credibility, transparency, and trust-building mechanisms.

Overall, the findings highlight the need to reduce informality in digital markets through formalization, seller verification, secure payments, clear return policies, and consumer protection strategies that strengthen trust and promote sustainable loyalty.

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CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

Authors' Contribution (CRediT Taxonomy)

Author	Roles
Author 1	Conceptualization, Investigation, Methodology, Funding acquisition, Project administration, Resources, Writing – original draft.
Author 2	Data curation, Formal analysis, Software, Supervision, Validation, Visualization, Writing – review & editing.
Author 3	Resources, Writing – original draft, Investigation, Methodology.
Author 4	Data curation, Formal analysis, Supervision.
Author 5	Investigation, Methodology, Funding acquisition, Formal analysis.