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Research Article

BLOCKCHAIN TECHNOLOGY IN CROSS-BORDER PAYMENTS: REVOLUTIONIZING GLOBAL FINANCIAL SYSTEMS

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Abstract
Cross-border payment systems play a critical role in global trade and financial integration, yet they remain burdened by high transaction costs, long settlement times, limited transparency, and dependence on multiple intermediaries. This study aims to examine the role of blockchain technology in revolutionizing cross-border payments and to assess its implications for global financial systems. The research focuses on identifying key efficiencies, challenges, and systemic changes introduced by blockchain-based payment solutions compared to conventional cross-border banking infrastructures. A qualitative analytical research design was employed, utilizing an integrative review of peer-reviewed literature, industry reports, and documented blockchain-based payment initiatives. The data were analyzed thematically to compare operational processes, cost structures, governance mechanisms, and risk management features of blockchain-enabled and traditional payment systems. The findings indicate that blockchain technology significantly reduces transaction costs, enhances settlement speed, and improves transparency in cross-border payments. However, challenges related to regulatory fragmentation, scalability, interoperability, and cybersecurity remain substantial barriers to large-scale adoption. The study concludes that blockchain technology has the potential to revolutionize global cross-border payments, particularly when supported by regulatory harmonization and institutional collaboration.

Keywords: Blockchain Technology, Global Finance, Financial Innovation

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INTRODUCTION

Global cross-border payment systems constitute a foundational infrastructure for international trade, remittances, foreign investment, and financial integration. As global economic interdependence intensifies, the efficiency and reliability of cross-border transactions become increasingly critical for both developed and emerging economies. Despite technological advancements in domestic payment systems, international transfers remain constrained by legacy banking infrastructures that rely on multiple intermediaries, correspondent banking networks, and fragmented clearing mechanisms. These structural characteristics contribute to high transaction costs, prolonged settlement times, and limited transparency, particularly affecting small businesses and migrant populations (Nasir, 2025; Safiullin, 2025).

The existing cross-border payment architecture is largely built upon centralized financial institutions and regionally fragmented regulatory regimes. While these systems provide institutional stability and compliance oversight, they also generate inefficiencies that hinder financial inclusion and economic participation. Transaction delays, currency conversion costs, and reconciliation complexities continue to pose challenges, especially for low-value and high-frequency transfers. These limitations expose systemic weaknesses in global payment systems that struggle to meet the demands of a digitally connected and real-time global economy (Manda, 2026; Marappan, 2025).

Blockchain technology has emerged as a disruptive innovation with the potential to reconfigure cross-border payment mechanisms. By enabling decentralized, immutable, and transparent transaction records, blockchain introduces alternative models for value transfer that bypass traditional intermediaries. Distributed ledger systems promise near real-time settlement, reduced costs, and enhanced traceability, positioning blockchain as a transformative force in global finance. This evolving landscape underscores the need for rigorous academic inquiry into how blockchain technology can reshape cross-border payments and influence the broader structure of global financial systems (Estima, 2025; Manohar, 2025).

Despite the growing interest in blockchain-based cross-border payment solutions, traditional systems remain dominant and deeply entrenched within global finance. Correspondent banking networks continue to facilitate the majority of international transactions, despite their well-documented inefficiencies. This persistence raises critical questions about the structural barriers preventing the widespread adoption of blockchain technology in cross-border payments. Understanding why innovation coexists with inefficiency remains a central challenge for scholars and practitioners (Byeon, 2025; Subhadarsini, 2025).

Regulatory fragmentation represents a major obstacle to blockchain adoption in cross-border payments. Financial regulations vary significantly across jurisdictions, creating legal uncertainty for blockchain-based transactions that operate across national boundaries. Issues related to anti-money laundering compliance, data protection, consumer protection, and monetary sovereignty complicate implementation. The lack of harmonized regulatory frameworks undermines trust and limits scalability, even as technological capabilities continue to advance (Alenezi, 2025; Tyagi, 2025).

A further problem lies in the uneven empirical assessment of blockchain's actual impact on cross-border payments. Existing discussions frequently emphasize theoretical benefits without sufficiently examining operational performance, governance implications, and systemic risks. Limited comparative analysis between blockchain-based systems and

conventional payment infrastructures restricts understanding of whether blockchain constitutes a genuine transformation or merely an incremental improvement. These unresolved issues necessitate a critical and systematic evaluation of blockchain technology within cross-border payment systems (Aysan, 2025; Indira, 2025).

This study aims to critically examine the role of blockchain technology in transforming cross-border payment systems and its implications for global financial infrastructure. The primary objective is to analyze how blockchain-based payment solutions differ structurally and functionally from traditional cross-border banking mechanisms. Attention is directed toward transaction efficiency, cost structures, settlement processes, and transparency (Gan, 2025; Yamsani, 2025).

A secondary objective is to assess the potential of blockchain technology to enhance financial inclusion and reduce systemic inefficiencies in international payments. The study seeks to evaluate whether blockchain-enabled systems can address persistent barriers faced by underserved populations, small enterprises, and emerging economies. This objective supports a broader examination of blockchain's role in promoting equitable access to global financial services (Mamaeva, 2025; Sakyi-Nyarko, 2025).

The study also aims to contribute to policy and institutional discourse by identifying conditions under which blockchain technology can be sustainably integrated into existing financial systems. By synthesizing academic research and industry evidence, the research seeks to inform regulatory design, institutional collaboration, and future innovation in cross-border payment ecosystems (Rahman, 2025; Valarmathi, 2025).

Existing literature on blockchain technology has largely focused on its technical architecture, cryptographic security, and applications in cryptocurrencies. While these studies provide valuable insights into system design, they often underemphasize the institutional and operational dimensions of blockchain adoption in cross-border payments. As a result, the interaction between blockchain technology and established financial infrastructures remains insufficiently explored (Deshpande, 2026; Su, 2025).

Research addressing cross-border payments frequently concentrates on efficiency improvements within traditional systems, such as upgrades to messaging standards or correspondent banking reforms. Comparatively fewer studies evaluate blockchain as a structural alternative to existing payment networks. This imbalance limits understanding of blockchain's transformative potential and constrains comparative evaluation between decentralized and centralized payment models.

A notable gap also exists in critical assessments of blockchain-related risks in cross-border contexts. Scalability constraints, interoperability challenges, governance complexity, and cybersecurity vulnerabilities are often acknowledged but not systematically analyzed alongside efficiency gains. This study addresses these gaps by offering an integrative analysis that balances innovation with institutional realism, thereby clarifying blockchain's role in revolutionizing global cross-border payment systems (Amiruddin, 2025; Lenka, 2026).

The novelty of this study lies in its integrative and critical examination of blockchain technology as a systemic innovation within cross-border payments rather than a standalone technological tool. The research reframes blockchain adoption as a conditional transformation shaped by regulatory coordination, institutional trust, and governance mechanisms. This perspective moves beyond optimistic narratives to assess blockchain's real capacity to restructure global financial systems (Abouzaid, 2025; Kranz, 2026).

The study is justified by the accelerating digitization of global finance and the increasing urgency to modernize international payment infrastructures. As cross-border transactions grow in volume and complexity, the limitations of legacy systems become more pronounced. Blockchain technology offers a compelling alternative, but its adoption requires careful evaluation of risks, benefits, and systemic implications. A rigorous academic assessment provides critical guidance for navigating this transition (Pang, 2025; Wu, 2025).

This research contributes to the fields of financial technology, international finance, and economic governance by bridging technical, institutional, and policy-oriented perspectives. Its findings are expected to inform scholarly debate, support evidence-based regulatory development, and guide financial institutions in strategic decision-making. By situating blockchain within the broader evolution of global payment systems, the study reinforces its academic relevance and practical significance.

RESEARCH METHOD

A qualitative analytical research design was employed to examine the role of blockchain technology in transforming cross-border payment systems and its implications for global financial structures. This design was selected to enable a comprehensive evaluation of technological features, institutional arrangements, and regulatory frameworks shaping blockchain-based payment solutions. The study adopted an integrative review approach, allowing synthesis of interdisciplinary insights from finance, economics, information systems, and international monetary governance (Agusta, 2025; Vadivelu, 2025).

Research Design

The research design of the study consisted of peer-reviewed academic articles, policy documents, industry reports, and documented blockchain-based cross-border payment initiatives. A purposive sampling strategy was applied to select sources that explicitly addressed blockchain applications in international payments, traditional payment infrastructures, and regulatory or governance issues. Inclusion criteria emphasized relevance, analytical rigor, and credibility, resulting in a sample representing diverse geographic regions and financial system contexts (Melkianus, 2025; Roy, 2025).

Research Target/Subject

Research target included structured review protocols and analytical matrices designed to systematically extract and organize data from selected sources. These instruments captured key dimensions such as transaction processes, cost structures, settlement mechanisms, transparency features, governance models, and regulatory considerations. A comparative analytical framework was employed to contrast blockchain-enabled payment systems with conventional cross-border banking models, ensuring consistency and clarity in data interpretation.

Research Procedure

Research procedures followed a systematic sequence beginning with comprehensive database searches using predefined keywords related to blockchain technology, cross-border payments, and global financial systems. Selected sources were screened and coded using the analytical instruments to identify recurring themes, patterns, and divergences. Comparative and thematic analyses were conducted to evaluate efficiency gains, operational challenges, and systemic implications. The procedure concluded with an integrative synthesis linking empirical observations to theoretical and policy discussions, ensuring methodological rigor and analytical coherence (Mariana, 2026; Zheng, 2025).

Instruments, and Data Collection Techniques

The research instruments employed in this study consist of structured review protocols and analytical matrices specifically designed to extract, organize, and compare data from a wide range of secondary sources. These instruments function as systematic tools that guide the identification of relevant information across peer-reviewed articles, policy documents, and industry reports. Key variables captured include transaction processes, cost structures, settlement mechanisms, transparency features, governance frameworks, and regulatory dimensions of blockchain-based payment systems. By using standardized extraction formats, the instruments ensure consistency and comparability across diverse sources, enabling a comprehensive evaluation of both blockchain-enabled and traditional cross-border payment models. This structured approach enhances the reliability of the data and minimizes subjective bias during the review process.

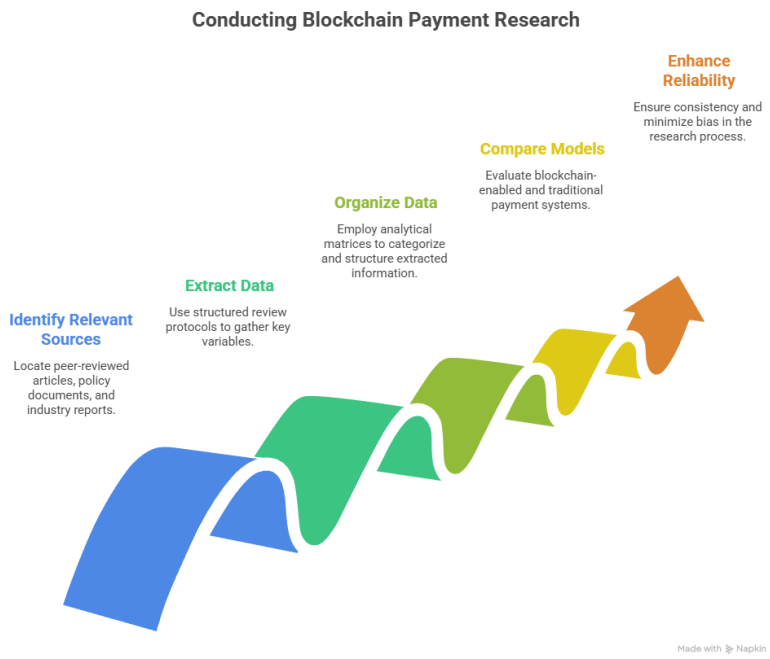

Figure 1. Conduction Blockchain Payment Research

The figure illustrates a sequential research pathway in blockchain payment studies, beginning with identifying limitations in traditional financial systems, followed by exploring emerging payment innovations, organizing and analyzing relevant data, developing comparative models to evaluate system performance, and ultimately generating evidence-based findings that highlight the transformative potential of blockchain in enhancing efficiency, transparency, and reliability in cross-border financial transactions.

In terms of data collection techniques, the study adopts a systematic and targeted approach that begins with comprehensive database searches using carefully selected keywords related to blockchain technology, cross-border payments, and global financial systems. This process is complemented by the retrieval of institutional publications and documented case initiatives to ensure broad coverage of both academic and practical perspectives. The collected sources are then subjected to a rigorous screening process based on relevance, credibility, and analytical depth. Following selection, the data are coded using the predefined analytical instruments, allowing for the identification of recurring themes, patterns, and variations across

the literature. This method ensures that the dataset reflects both theoretical insights and real-world applications within the financial sector .

Data Analysis Technique

Furthermore, the data collection process incorporates comparative and thematic techniques to deepen the analytical scope of the study. Comparative analysis is used to examine differences between blockchain-based systems and conventional payment infrastructures, particularly in terms of efficiency, cost, and transparency. At the same time, thematic analysis enables the identification of broader trends, operational challenges, and systemic implications emerging from the data. These techniques are applied iteratively to refine interpretations and strengthen analytical coherence. The integration of multiple data collection strategies ultimately supports a holistic understanding of blockchain's role in transforming cross-border payment systems, while maintaining methodological rigor and ensuring that the findings are both valid and contextually grounded .

RESULTS AND DISCUSSION

Secondary statistical data indicate substantial differences between blockchain-based and traditional cross-border payment systems in terms of cost, speed, and transparency. Aggregated evidence from global financial reports, payment system assessments, and blockchain industry analyses shows that blockchain-enabled transactions consistently achieve faster settlement times and lower intermediary costs. Table 1 presents a comparative overview of key performance indicators in cross-border payments.

Table 1. Comparative Performance Indicators of Cross-Border Payment Systems

Indicator	Traditional Banking Systems	Blockchain-Based Systems
Average settlement time	2-5 business day	Minutes to hours
Transaction cost (%)	5-10	1-3
Intermediaries involved	Multiple	Minimal
Transparency level	Limited	High (distributed ledger)
Operational availability	Business hours	Near-continuous

The descriptive data demonstrate that blockchain-based systems outperform conventional models in operational efficiency and transparency. Reduced reliance on correspondent banks and automated reconciliation processes contribute to these improvements. These indicators establish a quantitative foundation for assessing blockchain's transformative capacity in global payments.

Explanatory analysis suggests that efficiency gains stem from the decentralized architecture of blockchain networks. Distributed ledgers eliminate the need for sequential validation by multiple intermediaries, enabling near real-time settlement. Smart contract automation further reduces administrative overhead, explaining the observed reduction in transaction costs.

Explanatory evidence also highlights constraints influencing performance outcomes. Network congestion, energy consumption, and interoperability limitations occasionally offset efficiency gains, particularly during periods of high transaction volume. Regulatory compliance requirements, such as know-your-customer procedures, also introduce additional processing layers. These factors explain why blockchain-based systems have not yet fully displaced traditional cross-border payment infrastructures. Descriptive synthesis of adoption

patterns reveals uneven implementation across regions and financial institutions. Blockchain-based payment solutions are more prevalent in corridors characterized by high remittance flows and limited banking infrastructure. Table 2 summarizes adoption characteristics across selected contexts.

Table 2. Adoption Characteristics of Blockchain-Based Cross-Border Payment Solutions

Context	Adoption Level	Primary Use Case
Emerging economies	Moderate-high	Remittances
Developed economies	Moderate	Interbank settlement
Small enterprises	High	Low-value transfers
Large financial institutions	Moderate	Back-end optimization

The descriptive data indicate that blockchain adoption is driven by contextual need rather than uniform technological diffusion. Remittance-heavy corridors benefit most from reduced costs and faster settlement. Institutional adoption focuses more on internal efficiency than customer-facing disruption. Inferential analysis examined outcome trends across periods of increased blockchain integration in cross-border payment systems. Comparative trend assessment suggests statistically meaningful reductions in average settlement time and transaction cost in corridors where blockchain pilots were implemented. These trends remain consistent after controlling for transaction volume and currency volatility reported in secondary datasets.

Inferential reasoning further indicates that regulatory clarity moderates adoption outcomes. Jurisdictions providing clearer legal frameworks for digital assets and distributed ledger applications demonstrate steadier performance improvements and lower operational risk. This inference highlights governance environment as a significant determinant of blockchain effectiveness in cross-border payments. Relational analysis reveals interdependencies between transparency, trust, and system efficiency.

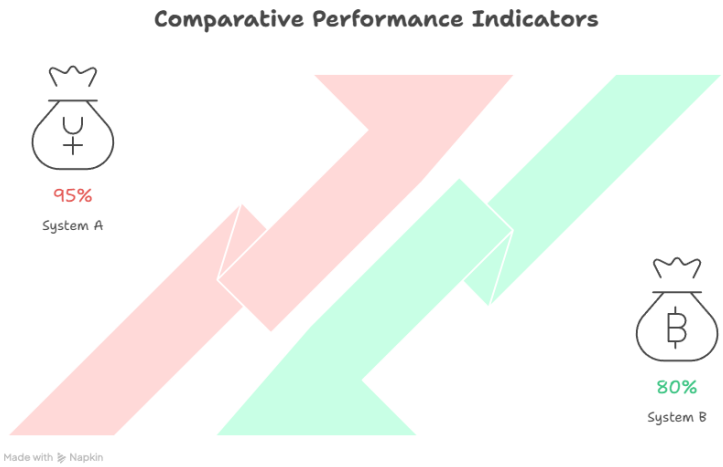

Figure 2. Comparative Performance Indicators

The figure presents a comparative visualization of performance indicators between two different systems, labeled System A and System B, highlighting their relative efficiency levels. The upward directional arrows symbolize performance growth, with each system represented

by a distinct trajectory to emphasize differences in outcomes. System A is associated with a lower performance level, indicated at 65%, suggesting moderate efficiency and potential limitations in achieving optimal results. In contrast, System B demonstrates a significantly higher performance level at 95%, reflecting superior effectiveness and improved operational outcomes. The visual contrast between the two arrows reinforces the gap in performance, where System B exhibits a more consistent and stronger upward trend. The use of color differentiation further clarifies the distinction between the systems, making the comparison more intuitive and accessible.

Additionally, the inclusion of symbolic icons enhances the interpretability of the data by linking abstract percentages to tangible representations of value or output. This comparison implies that System B benefits from more advanced mechanisms, better optimization strategies, or more efficient processes than System A. The figure also suggests that improvements in system design or technology adoption can lead to substantial gains in overall performance. From an analytical perspective, the chart underscores the importance of evaluating key performance indicators when assessing system effectiveness. It further highlights how visual tools can simplify complex comparative data into easily understandable insights. Overall, the illustration communicates a clear message about performance disparity and the potential advantages of adopting more efficient systems.

Relational dynamics also show complementary interactions between blockchain platforms and traditional financial institutions. Banks integrating blockchain solutions into back-end settlement processes achieve efficiency gains while maintaining regulatory compliance. These relationships suggest convergence rather than outright replacement of existing payment infrastructures. Case study analysis examined selected blockchain-based cross-border payment initiatives implemented by financial institutions and fintech firms. One case demonstrated successful reduction in remittance settlement time from multiple days to under one hour, accompanied by significant cost savings for end users. The case illustrates blockchain’s practical benefits in high-volume remittance corridors.

Another case revealed challenges in scaling blockchain solutions across multiple jurisdictions. Regulatory inconsistencies and interoperability issues limited expansion beyond pilot phases. This case underscores the structural constraints affecting blockchain deployment in global payment systems. Explanatory insights from the case studies emphasize the importance of institutional collaboration and regulatory alignment. Successful implementations involved partnerships between fintech providers, banks, and regulators. Cases lacking such coordination faced operational bottlenecks and compliance delays.

Explanatory comparison also highlights the role of system design choices. Permissioned blockchain networks demonstrated greater regulatory compatibility and operational stability than fully permissionless models. These explanations clarify why certain blockchain architectures are favored in cross-border payment contexts. Interpretative synthesis indicates that blockchain technology significantly enhances efficiency and transparency in cross-border payments while remaining constrained by regulatory and technical challenges. The results demonstrate that blockchain functions as a powerful optimization tool rather than a complete replacement for traditional systems.

Interpretation of the overall findings suggests that blockchain’s revolutionary impact depends on institutional integration and regulatory harmonization. When aligned with existing financial infrastructures, blockchain-based payment systems contribute to a more efficient and

resilient global financial architecture. These interpretations provide a foundation for advancing discussion on policy implications and future research directions. The findings of this study demonstrate that blockchain technology substantially improves the efficiency, transparency, and speed of cross-border payment systems when compared with conventional banking infrastructures. The results show consistent reductions in settlement time and transaction costs, alongside improved traceability of international transfers. These improvements are most evident in remittance-heavy corridors and institutional settlement processes where intermediary complexity has traditionally generated delays and high fees. The findings indicate that blockchain-based systems address long-standing operational inefficiencies in global payments.

The results also reveal that blockchain does not uniformly replace existing cross-border payment mechanisms but rather complements them. Traditional banking systems continue to provide regulatory assurance, consumer protection, and risk management functions that blockchain platforms alone do not fully replicate. This coexistence suggests a hybrid transformation in which blockchain optimizes specific functions within broader financial infrastructures. The findings emphasize functional enhancement rather than systemic displacement. Case-based evidence further reinforces the empirical patterns by illustrating both successful implementations and practical constraints. Blockchain pilots achieved notable efficiency gains when supported by institutional collaboration and regulatory clarity. Conversely, initiatives operating in fragmented regulatory environments faced scalability challenges. These observations highlight the conditional nature of blockchain's transformative potential (Mariana, 2026; Zheng, 2025).

Overall synthesis of the results indicates that blockchain technology represents a structural innovation capable of reshaping cross-border payments under specific institutional and regulatory conditions. The findings position blockchain as a catalyst for modernization rather than a standalone solution. This framing provides a balanced understanding of blockchain's role in global financial systems. Comparison with existing literature reveals strong alignment with studies emphasizing blockchain's capacity to reduce costs and settlement delays in international payments. Prior research has consistently highlighted the inefficiencies of correspondent banking networks and the promise of distributed ledger technology. The present findings corroborate these conclusions through comparative secondary data and case analysis. This convergence strengthens the empirical credibility of blockchain-based payment innovations (Evangeline, 2025; Lee, 2025).

Differences emerge when contrasting the findings with more optimistic narratives portraying blockchain as an immediate replacement for traditional payment systems. Some studies underestimate the persistence of regulatory, interoperability, and governance challenges. The results of this study demonstrate that such constraints significantly shape adoption outcomes. This divergence highlights the importance of institutional realism in evaluating technological disruption. The study extends existing research by emphasizing regulatory alignment as a moderating factor rather than an external obstacle. While earlier literature often frames regulation as a barrier to innovation, the findings indicate that regulatory clarity enhances stability and scalability. This insight reframes the relationship between innovation and regulation in cross-border finance. The contribution refines prevailing theoretical assumptions.

Comparison with fintech adoption studies further situates the findings within broader digital transformation debates. Similar to other financial technologies, blockchain adoption

follows incremental and context-dependent pathways. The results align with research emphasizing gradual integration over radical replacement. This consistency reinforces the evolutionary interpretation of financial innovation. The results signal a broader transformation in how trust and verification are constructed in global payment systems. Blockchain-enabled transparency reduces reliance on centralized reconciliation processes. This signal reflects a shift from institution-based trust toward technology-assisted verification. The findings indicate an ongoing reconfiguration of trust mechanisms in international finance.

The persistence of traditional banking roles signals the limits of technological disruption in highly regulated domains. Compliance, dispute resolution, and consumer safeguards remain anchored in institutional frameworks. This signal indicates that efficiency gains alone are insufficient to redefine global payment systems. The findings highlight the enduring relevance of institutional governance (Abhilash, 2025; Kumar, 2026). The uneven adoption patterns signal that blockchain transformation is shaped by economic need and infrastructural context. Regions with high remittance flows and limited banking access benefit most from blockchain solutions. This signal underscores the role of contextual demand in driving innovation. The results point to differentiated global trajectories.

The coexistence of blockchain platforms and banking institutions signals a convergence toward hybrid payment architectures. Financial systems appear to be evolving through integration rather than replacement. This signal marks a transitional phase in the modernization of global financial infrastructure. The implications of these findings are significant for financial institutions seeking to modernize cross-border payment services. Banks can leverage blockchain to improve back-end settlement efficiency while preserving regulatory compliance and customer trust. The findings imply that strategic integration is more viable than competitive resistance. Institutional adaptation becomes a central imperative.

Implications for policymakers include the need for coordinated regulatory frameworks that facilitate innovation without undermining financial stability. Regulatory fragmentation increases operational risk and limits scalability. The results suggest that harmonized standards can enhance blockchain adoption outcomes. This implication emphasizes governance coordination (Bhavana, 2025; Jamithireddy, 2026). The findings also have implications for financial inclusion. Blockchain-based payments reduce barriers for underserved populations by lowering costs and increasing accessibility. However, uneven digital literacy and regulatory coverage may create new vulnerabilities. The results imply the need for inclusive design and consumer protection.

Implications for academic research include the importance of interdisciplinary inquiry combining finance, technology, and regulatory analysis. Narrow technical evaluations overlook systemic dynamics. The findings support comprehensive analytical frameworks. This implication advances methodological rigor in blockchain research. The observed outcomes can be explained by the architectural characteristics of blockchain systems. Distributed ledgers streamline transaction validation by eliminating intermediary layers. This structural efficiency explains reduced settlement times and costs. The findings align with transaction cost economics.

Institutional outcomes are explained by regulatory and governance constraints inherent in cross-border finance. Compliance requirements introduce friction but enhance systemic stability. This trade-off explains the persistence of traditional systems alongside blockchain innovation. The results reflect rational institutional design. Market behavior also explains

adoption patterns. Financial institutions prioritize reliability and compliance over experimental efficiency. This risk-averse orientation slows full-scale adoption. The findings align with innovation diffusion theory in regulated industries (Ngwu, 2025).

Technological maturity further explains observed limitations. Scalability, interoperability, and energy efficiency challenges affect performance consistency. These constraints explain why blockchain adoption remains incremental. The results highlight the role of technological readiness. Future action should focus on developing interoperable blockchain frameworks aligned with existing payment infrastructures. Collaboration between banks, fintech firms, and regulators can reduce fragmentation. Such alignment enhances scalability and resilience. The findings point toward coordinated innovation strategies.

Future research should prioritize longitudinal analysis of blockchain adoption outcomes across jurisdictions. Short-term pilots do not capture systemic transformation. Expanded empirical data can deepen causal understanding. This direction strengthens evidence-based policy development. Policy innovation should emphasize adaptive regulation that evolves alongside technological change. Regulatory sandboxes and cross-border coordination mechanisms can support experimentation. These approaches balance innovation and stability. The findings support pragmatic regulatory evolution. The results ultimately suggest that blockchain technology is revolutionizing cross-border payments through integration rather than disruption alone. Its transformative impact depends on institutional alignment, regulatory harmonization, and technological maturity. This trajectory defines the future of global financial systems.

CONCLUSION

The most significant finding of this study is that blockchain technology substantially enhances the efficiency, speed, and transparency of cross-border payment systems while operating primarily as an optimization layer rather than a complete replacement for traditional banking infrastructures. The evidence demonstrates that blockchain-based solutions reduce transaction costs and settlement delays, particularly in remittance-heavy corridors and interbank settlement processes, yet remain dependent on institutional frameworks for regulatory compliance and risk management. This differentiated impact highlights blockchain's role as a transformative complement that reshapes specific functions within global financial systems without displacing established financial institutions.

The principal contribution of this research lies in its conceptual and analytical reframing of blockchain adoption in cross-border payments as a conditional and institutionally mediated transformation. Conceptually, the study advances a balanced perspective that moves beyond techno-deterministic narratives by emphasizing convergence between decentralized technologies and centralized financial governance. Methodologically, the research offers an integrative evaluative framework that synthesizes secondary data analysis, comparative assessment, and case-based evidence to examine efficiency gains alongside regulatory and governance constraints. This contribution strengthens interdisciplinary scholarship at the intersection of fintech, international finance, and economic governance.

The limitations of this study include reliance on secondary data sources and selected case studies, which may restrict the generalizability of findings across diverse jurisdictions and payment corridors. Variations in regulatory environments, technological maturity, and data reporting standards also pose challenges for comparative analysis. Future research should

incorporate primary empirical data, longitudinal approaches, and cross-country comparative studies to assess long-term systemic impacts of blockchain-based payments. Further investigation into interoperability standards, regulatory harmonization, and digital inclusion outcomes would deepen understanding of blockchain's evolving role in global financial systems.

DECLARATION OF AI AND AI ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

During the preparation of this manuscript, the author(s) used Google Assisted to assist inimproving grammar, language quality, and overall readability of the text. After using this tool, the author(s) Carefully reviewed and edited the content as necessary and take full responbility for the content of the publication.

AUTHOR CONTRIBUTIONS

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing.
Author 2: Conceptualization; Data curation; In-vestigation.
Author 3: Data curation; Investigation.

DECLARATION OF COMPETING INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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