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Central Bank-Led Fintech Competition and Bank Digital Transformation in Cambodia: Evidence from Bakong, Khqr, and Interoperable Payment Infrastructure

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ABSTRACT

This study examines how fintech competition has transformed financial intermediation in Cambodia and how commercial banks have responded to central-bank-led interoperable payment infrastructure. Using a qualitative case-study approach and documentary analysis, the research focuses on Bakong, KHQR, and Cambodia's digital payment ecosystem. The findings indicate that fintech development in Cambodia represents a state-enabled restructuring of market competition rather than simple bank displacement. By the end of 2023, the country recorded 19.7 million e-wallet accounts, while Bakong connected 19.5 million accounts through 74 members. The study concludes that interoperable public payment infrastructure can increase competition and efficiency, although its long-term success depends on financial literacy, cybersecurity, data governance, institutional capacity, and balanced regulation.

INTRODUCTION

Cambodia offers an analytically important case for examining how fintech competition develops in a lower-middle-income economy where market innovation has been closely coupled with public payment infrastructure. In many accounts of fintech development, banks are treated as incumbents exposed to disruptive pressure from agile non-bank entrants. Cambodia complicates that narrative. Its fintech transition has not been driven solely by

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venture-backed platform firms or private wallet providers. Rather, the most consequential reconfiguration of the competitive environment has come from the National Bank of Cambodia's decision to provide interoperable payment infrastructure through Bakong and to standardize merchant-facing QR acceptance through KHQR (Seng *et al.*, 2026).

The Cambodian financial system has developed from a post-conflict institutional basis to a diversified sector made up of commercial banks, specialized banks, microfinance deposit-taking institutions, microfinance institutions, payment-service institutions and e-money issuers (Aiba and Samreth, 2026). This progress has taken place in two different macroeconomic environments. First, Cambodia is quite dollarized: the United States dollar still plays a prominent role in deposits, credit and higher-value transactions, while the Khmer riel is important for domestic cash circulation and small-value exchange (International Monetary Fund. Asia and Pacific Dept, 2024). Second, the country has a substantial microfinance industry and a long-standing policy priority on extending formal financial access for rural households, women and micro and small enterprises (Asian Development Bank, 2024). These factors imply that payment infrastructure is not merely a problem of fintech, but also of inclusiveness, monetary sovereignty and regulatory architecture.

The research problem addressed in this article is therefore the following: How has central-bank-led fintech infrastructure altered competitive dynamics in Cambodia's financial sector, and how have incumbent commercial banks adapted their strategies, operations, and business models in response? The question matters for three reasons. First, Cambodia's fintech experience helps clarify how public digital infrastructure can alter the structure of competition without replacing private innovation. Second, the case contributes to a broader literature on platform-mediated financial ecosystems, in which interoperability changes the economic basis of market power. Third, the findings have relevance for emerging economies that seek to expand digital financial inclusion while preserving financial stability and consumer protection.

This article pursues four research objectives. The first is to identify the structural and policy drivers of Cambodia's fintech expansion since 2015. The second is to assess the systemic significance of Bakong and KHQR as interoperable infrastructures. The third is to analyze how commercial banks have responded through digital transformation, partnership strategies, and operational modernization. The fourth is to formulate empirically testable hypotheses and statistical modeling strategies that can be used in future quantitative research.

LITERATURE REVIEW & HYPOTHESIS DEVELOPMENT

Fintech Competition and The Reconfiguration of Banking

The literature on fintech competition commonly emphasizes the unbundling of banking functions. Payments, remittances, small-ticket credit, wealth management, and insurance distribution can be separated from the integrated balance-sheet model traditionally associated with banks. Christensen, Raynor and McDonald (2015) argue that disruption typically begins where entrants offer simpler, cheaper, or more convenient services in product niches neglected by incumbents and in financial services, this pattern is visible in mobile wallets, digital remittances, peer-to-peer transfers, and app-based consumer credit.

Yet emerging-market fintech does not always follow a pure disruption model. Banks often retain advantages in trust, regulatory capital, deposit-taking capacity, credit underwriting, and corporate relationships. Fintech entrants tend to compete most forcefully where the product is transaction-intensive and infrastructure-light: payments, merchant acceptance, e-wallets, and short-term consumer finance. The result is frequently segmented competition, in which fintechs exert direct pressure in payments and indirect pressure in banking by changing customers' expectations of speed, convenience, and interface quality (Seng *et al.*, 2026).

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Cambodia fits this segmented pattern. Payment-service institutions and mobile wallets have competed aggressively in retail transfers and merchant payments, while banks remain central in deposits, corporate finance, trade finance, and larger-value lending. The arrival of interoperable public rails, however, changes the strategic implications of segmentation. Proprietary acceptance networks become less valuable when a standardized QR code allows multiple providers to reach the same merchant base. Competitive advantage then shifts from network closure toward user experience, service reliability, data analytics, ecosystem integration, and credit conversion (Aiba and Ouk, 2026).

Digital Transformation and Dynamic Capabilities in Banks

Digital transformation is not just about digitization of current processes. Vial (2019) defines it as a process where digital innovations generate strategic responses that transform the way firms create value, structure themselves and compete. Verhoef *et al.* (2021) make a similar tripartite difference which define that digitization means the conversion of analog information into digital information. Digitalization takes a step further, and uses digital technologies to fine-tune current processes. Digital transformation goes the deepest, changing business models and the organization's very identity (Westerman, Bonnet and McAfee, 2014; Hai, Van and Tuyet, 2021; Tang, 2021; Javaid *et al.*, 2024).

The theory of dynamic capabilities provides a valuable lens through which to view how banks respond to fintech competition. The three fundamental capacity clusters are identifying opportunities and challenges, seizing through investments and business-model choices, and reconfiguring organizational assets to sustain adaptation (Teece, 2018). All three are represented by Cambodia's biggest banks. They have faced the competitive pressure of digital wallets and app-centric financial services; seized opportunities by launching mobile-first applications, digitizing agent networks, and entering platform partnerships; and transformed their systems by modernizing core banking, adopting APIs and cloud infrastructure, and building data capabilities (Aiba and Ouk, 2026).

This theoretical lens is important because Cambodian banks have not responded uniformly. Institutions with earlier digital investments, stronger technology teams, and clearer channel strategies have moved faster. Others remain constrained by legacy core systems, conservative governance structures, limited data infrastructure, and shortages of specialized talent. The Cambodian case therefore illustrates that fintech competition produces transformation only where banks possess, build, or acquire the organizational capabilities needed to respond.

Public Infrastructure, Platform Interoperability, and Coopetition

The most distinctive feature of Cambodia's fintech landscape is the role of central-bank-led infrastructure. Bakong, officially launched by the NBC in October 2020, operates as an interbank payment platform that supports near-instant transfers across participating institutions (National Bank of Cambodia, 2020). KHQR functions at the customer-facing layer by standardizing merchant QR acceptance. The official Bakong portal describes KHQR as a standardized EMV QR code that allows a single merchant code to receive payments from participating providers, reducing the need for multiple proprietary QR displays (Seng *et al.*, 2026).

This arrangement is best understood as regulated platform interoperability. Public infrastructure lowers the cost of market participation while limiting the capacity of any one private provider to monopolize the acceptance layer. In this sense, Bakong and KHQR create a competitive commons (Seng *et al.*, 2026). Banks and fintechs continue to compete, but they do so on shared rails. This produces a pattern of coopetition which consist of institutions

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cooperate through common infrastructure while competing on customer acquisition, pricing, service design, credit offerings, and ecosystem partnerships (Aiba and Ouk, 2026; Aiba and Samreth, 2026).

Comparable models can be observed in India's Unified Payments Interface and Brazil's Pix, although Cambodia's structure reflects its own constraints: dollarization, smaller market scale, strong microfinance presence, and an inclusion-focused policy agenda (Reserve Bank of India, 2025). These differences make Cambodia particularly relevant for smaller emerging economies that may not be able to rely on market-led private infrastructure alone.

Financial Inclusion, Consumer Protection, and Digital Risk

Digital payments lower the cost of transactions, increase the use of accounts and generate data trails that help with access to credit. But financial inclusion is not just about increasing the number of accounts. Meaningful inclusion is using official services in a safe, economical and effective manner. ADB's assessment of Cambodia's inclusive financial-sector development program identified prior obstacles such as limited access for disadvantaged families, deficient financial infrastructure, and the need for improved consumer protection and financial awareness (Asian Development Bank, 2024). Similarly, the NBC's Annual Report relates payment-system modernization to financial inclusion, recording 19.7 million e-wallet accounts and 601.3 million payment-service-provider transactions in 2023 (National Bank of Cambodia, 2024).

Digital growth also creates risks and users with limited financial or digital literacy may be exposed to phishing, social engineering, mis-selling, opaque fees, or inappropriate credit. Operational vulnerabilities grow as financial institutions become more dependent on cloud providers, identity-verification systems, telecommunications networks, and payment gateways. A modern fintech ecosystem therefore requires cybersecurity capability, data-protection rules, incident reporting, fraud monitoring, and consumer-recourse mechanisms. Cambodia's policy challenge is not whether to permit fintech growth, but how to make that growth resilient and accountable (Cherkaoui *et al.*, 2021; Obaidan and Saeed, 2021; Adamu, Niemimaa and Spagnoletti, 2026).

Conceptual Framework

The conceptual framework developed in this article links central-bank infrastructure, fintech competition, bank transformation, and developmental outcomes. The mechanism is sequential but not linear. Public infrastructure reduces fragmentation and increases interoperability. Interoperability alters competitive incentives. Competitive pressure and shared technical standards push banks toward digital transformation and improved digital capability expands payment usage and potentially financial inclusion, although the benefits are moderated by literacy, cybersecurity, regulation, and connectivity.

Table 1. Conceptual Framework Constructs and Observable Indicators

Construct	Definition in This Study	Expected Mechanism	Observable Indicators
Central-bank-led infrastructure	Publicly sponsored or operated payment rails, including Bakong and KHQR	Reduces fragmentation and lowers participation barriers	Number of members; connected accounts; transaction volume; transaction value
Fintech competition	Competitive pressure from mobile wallets, payment-service	Forces banks to improve digital channels and customer experience	Wallet growth; merchant QR adoption; payment-service transactions

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Construct	Definition in This Study	Expected Mechanism	Observable Indicators
	institutions, and platform providers		
Bank digital transformation	Strategic and operational modernization by banks	Converts competitive pressure into capability development	App adoption; API readiness; digital transaction share; core-system modernization
Financial inclusion	Expanded and effective use of formal financial services	Digital payments reduce access and transaction frictions	E-wallet accounts; account ownership; SME payment usage
Risk governance	Supervisory and institutional capacity to manage digital risk	Moderates the sustainability of fintech growth	Cybersecurity practices; consumer protection; literacy programs; data governance

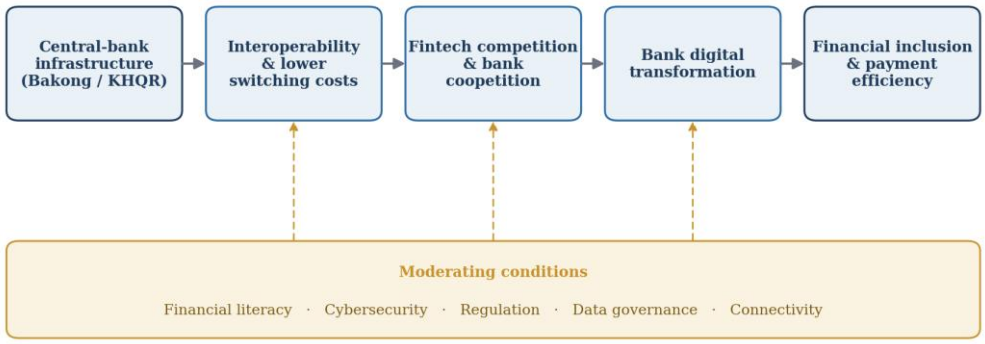

Figure 1. Conceptual Model of Infrastructure-led Fintech Transformation in Cambodia

RESEARCH METHODS

Research Design

The study adopts an explanatory qualitative case-study design. This design is appropriate because the research objective is not merely to describe Cambodia's fintech sector, but to explain how institutional infrastructure has shaped market competition and organizational transformation. A case-study approach is also suitable where boundaries between policy, technology, regulation, and market behavior are closely intertwined.

Cambodia is treated as a single embedded case. The national fintech ecosystem forms the primary case, while Bakong, KHQR, commercial-bank digitalization, and SME fintech usage function as embedded analytical units. This structure allows the analysis to connect macro-level policy infrastructure with meso-level institutional competition and micro-level usage patterns.

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Data Sources

The study draws on four categories of documentary evidence. The first consists of official materials published by the National Bank of Cambodia, especially the Bakong website and the NBC Annual Report 2023 (National Bank of Cambodia, 2021, 2024). The second comprises policy and development documents, including Cambodia's Digital Economy and Society Policy Framework 2021–2035, ADB assessments of financial inclusion and financial-sector development, and World Bank macroeconomic reporting (ROYAL GOVERNMENT OF CAMBODIA Supreme National Economic Council, 2021; The World Bank Group, 2023; Asian Development Bank, 2024). The third consists of peer-reviewed and scholarly sources on digital transformation, disruption, dynamic capabilities, and platform competition. The fourth consists of analytical tables constructed by the authors through the synthesis of these official and institutional sources.

The article deliberately distinguishes between verified official statistics and indicative sector estimates. Official figures are used only when they are directly supported by NBC, World Bank, ADB, or IMF sources (ROYAL GOVERNMENT OF CAMBODIA Supreme National Economic Council, 2021; The World Bank Group, 2023; Asian Development Bank, 2024; International Monetary Fund. Asia and Pacific Dept, 2024). Indicative figures, such as institution-level app-user estimates or SME adoption shares, are presented only as analytical synthesis and are labelled accordingly, because some private-sector data in Cambodia are not systematically disclosed across institutions.

Analytical Strategy

The analysis proceeds through structured documentary synthesis. First, Cambodia's macro-financial and policy context is reconstructed from official and institutional sources. Second, the technological and competitive functions of Bakong and KHQR are analyzed as infrastructural interventions. Third, bank responses are interpreted through dynamic capabilities theory. And, fourth, risks and constraints are assessed through the lenses of financial inclusion, cybersecurity, and regulatory proportionality. Finally, the article formulates hypotheses and proposes statistical strategies for future empirical validation.

Hypothesis Development and Statistical Modeling Strategy

Although the present article is primarily qualitative, it identifies empirically testable hypotheses suitable for future quantitative research. These hypotheses are stated in formal null and alternative form.

Table 2. Hypotheses and Suggested Statistical Tests

Hypothesis Domain	Null Hypothesis (H_0)	Alternative Hypothesis (H_1)	Suggested Test
Interoperability and adoption	H0: The expansion of Bakong/KHQR participation has no statistically significant association with growth in digital payment transaction volume.	H1: The expansion of Bakong/KHQR participation is positively associated with growth in digital payment transaction volume.	Time-series regression or panel regression using quarterly payment data
Bank transformation	H0: Fintech competition intensity has no statistically significant effect on banks'	H1: Higher fintech competition intensity is associated with greater	Bank-level panel regression

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Hypothesis Domain	Null Hypothesis (H_0)	Alternative Hypothesis (H_1)	Suggested Test
	digital-channel investment or digital transaction share.	bank digital-channel investment and higher digital transaction share.	with fixed effects
Financial inclusion	H0: District-level digital payment infrastructure has no significant association with account ownership or formal financial-service use.	H1: District-level digital payment infrastructure is positively associated with account ownership and formal financial-service use.	Difference-in-differences or multilevel logistic regression
SME usage	H0: SME adoption of KHQR/Bakong payments has no significant relationship with access to working-capital finance.	H1: SME adoption of KHQR/Bakong payments is positively associated with access to working-capital finance.	Logistic regression or propensity-score matching
De-dollarization	H0: Bakong usage has no significant association with the share of Khmer riel transactions.	H1: Bakong usage is associated with an increase in the share of Khmer riel transactions.	Vector autoregression or interrupted time-series analysis
Consumer-risk moderation	H0: Financial literacy does not moderate the relationship between digital-finance adoption and consumer-risk exposure.	H1: Financial literacy moderates the relationship between digital-finance adoption and consumer-risk exposure.	Structural equation modeling with latent literacy and risk constructs

A rigorous empirical extension would estimate models at three levels. At the national level, monthly or quarterly payment-system data could be used to estimate whether Bakong and KHQR growth predicts transaction volume after controlling for mobile-internet penetration, GDP growth, inflation, and tourism recovery. A baseline model would take the form:

$$\Delta ln(DPT_t) = \alpha + \beta_1 ln(BM_t) + \beta_2 ln(KHQR_t) + \beta_3 MI_t + \beta_4 GDP_t + \beta_5 TOUR_t + \varepsilon_t$$

where DPT_t denotes digital payment transactions, BM_t denotes Bakong membership or connected accounts, $KHQR_t$ denotes merchant QR acceptance points, MI_t denotes mobile-internet penetration, GDP_t denotes economic activity, and $TOUR_t$ captures tourism recovery. At the bank level, fixed-effects panel regression could estimate whether fintech competition is associated with bank digital transformation:

$$DigitalShare_{it} = \alpha_i + \lambda_t + \beta_1 Competition_t + \beta_2 CoreModernization_{it} + \beta_3 BranchNetwork_{it} + \beta_4 Capital_{it} + u_{it}$$

where $DigitalShare_{it}$ is the share of bank transactions conducted through digital channels, $Competition_t$ represents payment-service-provider transaction growth or wallet penetration, $CoreModernization_{it}$ captures technology readiness, and fixed effects control for unobserved bank-level characteristics.

At the SME level, logistic regression or structural equation modeling could assess whether digital payment adoption predicts access to finance, controlling for firm size, sector, location, years in operation, gender of ownership, and formal-registration status. A structural

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equation model would be especially useful because it could treat digital capability, trust, literacy, and credit access as latent constructs rather than single observed variables.

RESULTS & DISCUSSION

Cambodia's Fintech Expansion: Structural and Policy Drivers

In Cambodia, fintech has grown as a result of a combination of demographic demand, technical supply and legislative direction. A young and more mobile-first populace has created a significant demand for low-cost, convenient banking services. Urbanisation in Phnom Penh, Siem Reap, Sihanoukville and regional centres has enhanced the usefulness of digital retail payments. The necessity for domestic and cross-border remittances has also been a driver for the use of mobile transfer, notably for workers and micro-entrepreneurs.

On the supply side, the declining costs of mobile-application development, cloud infrastructure, e-KYC capabilities, and regional platform spillovers have decreased entry barriers for payment providers. Fintechs and wallets may focus on consumer interfaces, agent networks and merchant acquisition without having to replicate the whole balance-sheet power of banks. Banks, meanwhile, were under pressure to re-design their digital channels to match the speed and ease of non-bank suppliers.

Policy has been equally important. The Royal Government of Cambodia's Digital Economy and Society Policy Framework 2021–2035 positions digital transformation as a national development priority (ROYAL GOVERNMENT OF CAMBODIA Supreme National Economic Council, 2021). The NBC's fintech policy orientation and payment-system modernization efforts place fintech within a supervised modernization agenda rather than outside the regulatory perimeter. The assessment of financial sector reforms of ADB in Cambodia stresses the need to upgrade financial infrastructure, expand financial inclusion, and strengthen stability frameworks (Asian Development Bank, 2024).

Verified Payment-System Outcomes

Official NBC data show that digital payment ecosystem in Cambodia now operates at a macroeconomically significant scale. In 2023, the country recorded 19.7 million e-wallet accounts, 601.3 million payment-service-provider transactions, and USD 75.8 billion in transaction value—almost 2.4 times GDP (National Bank of Cambodia, 2024). These figures show that digital payments are no longer a niche urban convenience but a vital piece of financial infrastructure.

Table 3. Verified Cambodian Payment-System Indicators in 2023

Indicator	2023 verified figure	Analytical significance	Source
Registered e-wallet accounts	19.7 million	Indicates broad consumer reach across wallet and payment-service providers	NBC Annual Report 2023
Payment-service-provider transactions	601.3 million	Shows high-frequency usage of digital payment channels	NBC Annual Report 2023
Payment-service-provider transaction value	USD 75.8 billion	Equivalent to approximately 2.4 times GDP	NBC Annual Report 2023

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Indicator	2023 verified figure	Analytical significance	Source
Growth in transaction value	18%	Demonstrates continued expansion after pandemic-period digitization	NBC Annual Report 2023
Licensed payment-service providers	33 providers and 2 institutions	Confirms a competitive non-bank payment ecosystem	NBC Annual Report 2023

The significance of these figures lies not only in their size but in their institutional interpretation. Cambodia has reached a stage at which payments data, wallet usage, and QR acceptance can influence bank strategy, SME behavior, consumer habits, and supervisory priorities. Payment infrastructure has become a competitive arena in its own right.

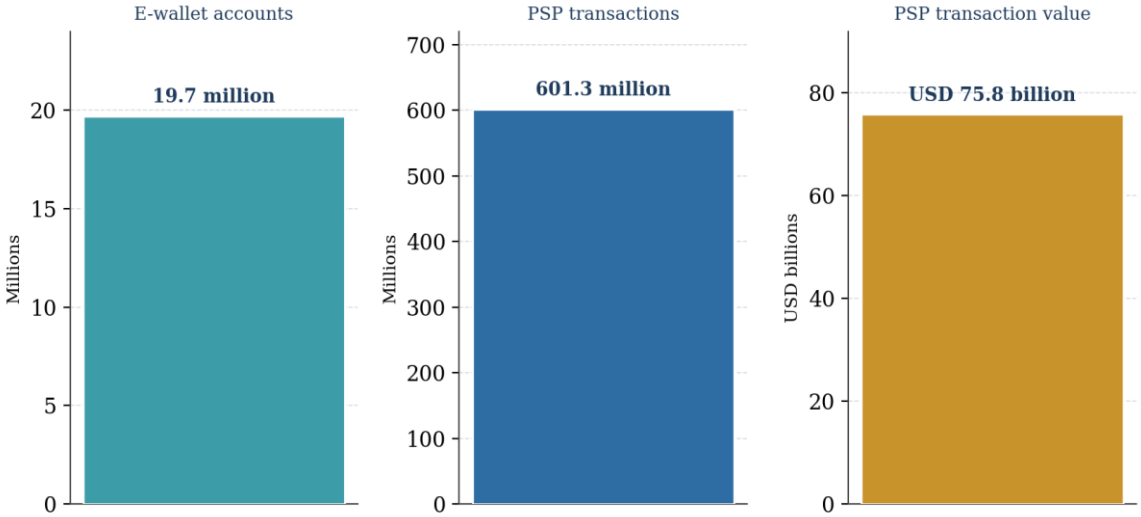

Figure 2. Cambodia Digital Payment Ecosystem Scale in 2023

Bakong as National Payment Hub

Bakong is the central infrastructure in Cambodia's fintech transformation. According to the NBC Annual Report 2023, Bakong was officially launched on 28 October 2020 and had 74 members by the end of 2023, including 58 official members and 16 institutions in integration. The report records approximately 0.6 million customers registered directly through Bakong and about 19.5 million accounts connected through the system (National Bank of Cambodia, 2024). This distinction is important: Bakong's systemic significance is not limited to direct wallet users, because its rail connects accounts across participating banks and payment institutions.

Table 4. Bakong Payment-System Metrics in 2023

Bakong Metric	2023 Figure	Interpretation
Total members	74	Demonstrates broad institutional participation
Official members	58	Indicates mature integration among licensed institutions
Institutions in integration	16	Shows continued ecosystem expansion

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Bakong Metric	2023 Figure	Interpretation
Directly registered customers	Approximately 0.6 million	Reflects users registered through Bakong itself
Connected accounts	Approximately 19.5 million	Captures broader rail-level reach across institutions
Total Bakong transactions	200.93 million	Indicates large-scale operational adoption
KHR transactions	68.79 million	Shows material domestic-currency use
USD transactions	132.14 million	Reflects continued dollarized transaction behavior
KHR transaction value	KHR 81.05 trillion	Shows substantial riel-denominated activity
USD transaction value	USD 53.76 billion	Confirms high-value usage on the system

These data reveal a dual role and Bakong is both a retail payment facilitator and a national payment hub. Its dual-currency design is particularly important in Cambodia's dollarized economy. By supporting both Khmer riel and United States dollar payments, the system avoids imposing abrupt monetary substitution on users. At the same time, by making riel payments cheaper and more convenient, it may contribute gradually to domestic-currency normalization. Whether this effect is statistically significant remains an open empirical question, but it is sufficiently plausible to warrant formal testing.

KHQR and the Competitive Logic of Interoperability

KHQR addresses a practical problem that existed before standardized QR acceptance: merchants often needed to display several QR codes, each connected to a different bank or wallet. This created clutter at the point of sale and friction for customers. By allowing a single QR code to receive payments from multiple participating providers, KHQR reduces acceptance complexity and weakens the value of closed proprietary networks.

The competitive implication is substantial. Before interoperability, a provider could compete partly by building an exclusive acceptance network. After interoperability, acceptance becomes more like a shared utility. Providers must compete instead on app reliability, onboarding ease, loyalty features, merchant services, data analytics, credit products, and integration with business workflows. This is a healthier basis for competition because it reduces duplication while preserving incentives for service innovation.

Figure 3 visualizes Bakong transaction volume by currency and the exact 2023 values are 68.79 million KHR transactions and 132.14 million USD transactions, with the combined total reported as 200.93 million transactions. Figure 4 displays transaction value using two panels because the units differ: KHR 81.05 trillion and USD 53.76 billion.

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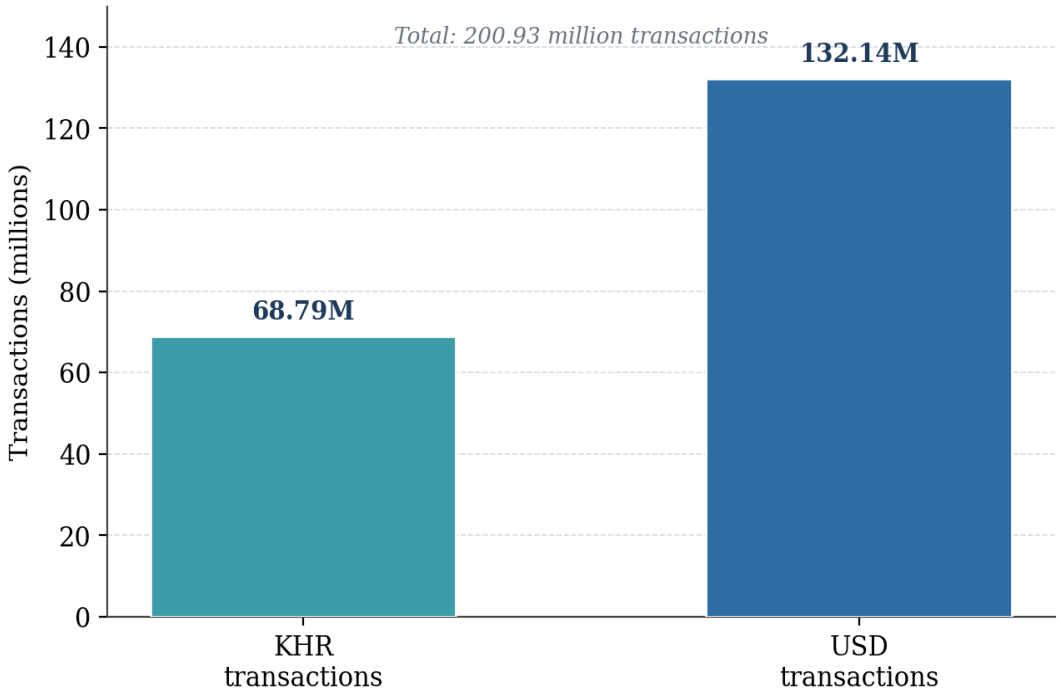

Figure 3. Bakong Transaction Volume by Currency in 2023

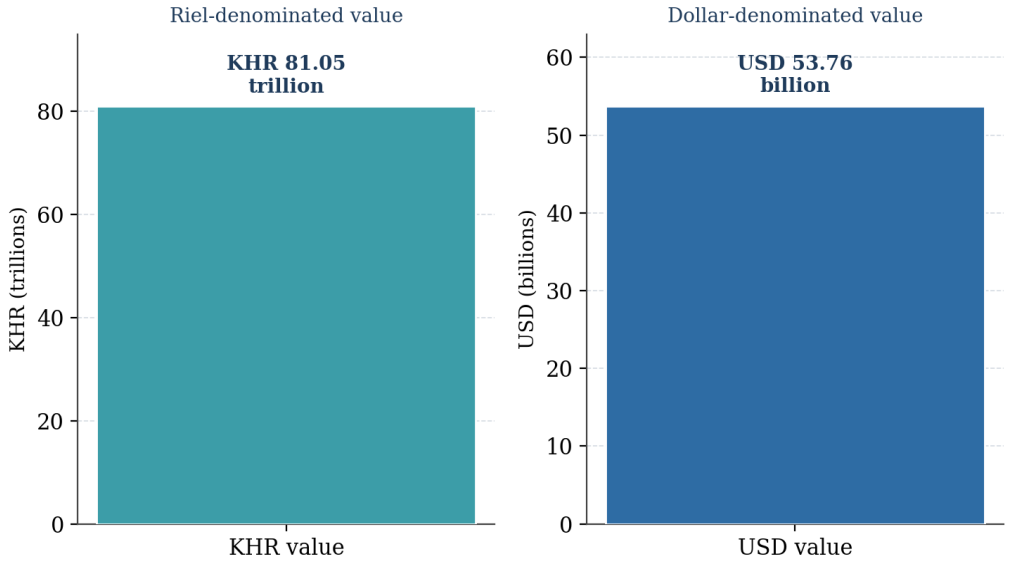

Figure 4. Bakong Transaction Value by Currency in 2023

Cross-Border Integration

The NBC Annual Report 2023 states that Cambodia expanded payment connectivity with Thailand, Laos, Vietnam, China, Japan, Singapore, Malaysia, Indonesia, and Alipay-related channels (National Bank of Cambodia, 2024). The report also records the 2023 launch of QR payment connections with Thailand, Laos, Vietnam, and UnionPay International. These linkages are strategically important because Cambodia's economy is deeply connected to tourism, migration, regional trade, and remittances.

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Cross-border QR connectivity changes the economics of small-value international payments and traditional correspondent banking channels are often too costly and slow for low value remittances and tourist payments. Interoperable QR systems can reduce frictions for migrant workers, small merchants, and travelers. For Cambodia, such corridors may also reduce dependence on third-currency intermediation over time, particularly if local currency settlement mechanisms deepen.

Commercial Bank Responses: From Channel Digitization to Organizational Reconfiguration

Cambodian commercial banks have responded to fintech competition through a combination of mobile applications, agent banking, partnerships, and internal transformation. In addition to, the strongest banks have treated digital channels not as secondary service outlets but as primary engines of customer acquisition and retention. Others have proceeded more cautiously, often constrained by legacy core systems and branch-centered operating models.

Table 5. Bank Transformation Dimensions and Strategic Implications

Bank Transformation Dimension	Typical Response	Strategic Implication
Customer channels	Mobile apps, internet banking, QR payments, agent-assisted digital services	Shifts competition from branch access to interface quality
Partnerships	E-commerce, utilities, ride-hailing, food delivery, payroll, agricultural value chains	Embeds banking within non-bank customer journeys
Technology architecture	API integration, core-banking modernization, hybrid cloud, cybersecurity tooling	Determines speed of product launch and ecosystem participation
Data and analytics	Transaction scoring, segmentation, fraud detection, merchant analytics	Converts payment data into credit and risk-management capability
Organizational structure	Digital factories, agile teams, product-management functions	Shortens innovation cycles and improves customer responsiveness
Human capital	Recruitment and training in cybersecurity, data engineering, UX design, cloud architecture	Creates a durable capability gap between digital leaders and laggards

Dynamic capabilities theory explains why banks have diverged. Some institutions have sensed fintech threats early and invested ahead of the market. Others have recognized the threat but have been slower to seize the opportunity because of internal governance, technology debt, or skill shortages. The implication for Cambodia is that fintech competition will not produce uniform bank modernization. It will widen the gap between institutions that can reconfigure and those that cannot.

Analytical Comparison of Bank Digitalization Pathways

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This analysis identifies three illustrative bank archetypes: mobile-first acceleration, agent-network digitization, and hybrid branch-digital modernization. These are analytically useful, but institution-level figures should be treated cautiously unless validated by audited disclosures. The following table therefore reframes the comparison as a typology rather than a definitive ranking.

Table 6. Digitalization Archetypes Among Cambodian Banks

Digitalization Archetype	Typical Cambodian Example	Starting Advantage	Main Constraint	Competitive Outlook
Mobile-first bank	App-centric commercial bank	Strong customer interface, rapid product iteration, high digital engagement	Need to sustain cybersecurity, reliability, and data governance at scale	Likely to lead in consumer payments, lifestyle banking, and digital credit
Agent-network digitizer	Bank with microfinance or rural footprint	Trust, geographic reach, agent-assisted onboarding	Complexity of integrating physical networks with real-time digital systems	Strong position in rural inclusion and SME services
Hybrid corporate bank	Traditional bank with corporate and real-estate strengths	Established balance sheet, corporate relationships, branch trust	Legacy systems and slower digital product cycles	Defensible in corporate banking, but vulnerable in retail payments

This typology shows that digital transformation is path-dependent. Banks do not begin from the same asset base, and therefore do not converge toward one identical model. In Cambodia, the most durable strategies are likely to combine digital scale with trust, risk management, and ecosystem partnerships.

SME Fintech Usage and the Limits of Payment-Led Inclusion

SMEs are central to Cambodia's private-sector development, yet their fintech adoption is uneven. Digital payments are easier to adopt than digital credit, supply-chain finance, or digital insurance. This pattern is consistent with the broader financial-inclusion literature: payments create the entry point, but credit requires reliable identity, transaction history, risk models, legal enforceability, and repayment capacity.

Table 7. SME Fintech Service Categories, Adoption Patterns, and Policy Responses

SME Fintech Service Category	Expected Adoption Pattern	Main Barrier	Policy or Market Response
KHQR/Bakong merchant payments	Highest adoption among formal and semi-formal urban SMEs	Device access, connectivity, merchant education	Merchant training, low-cost QR onboarding, rural connectivity investment
Mobile business banking	Moderate adoption among formal SMEs	KYC documentation and account-maintenance sensitivity	Simplified business onboarding and tiered KYC

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SME Fintech Service Category	Expected Adoption Pattern	Main Barrier	Policy or Market Response
Digital payroll	Growing in garment, service, and urban firms	Employee preference for cash and limited account use	Worker education and low-fee salary accounts
E-commerce payment gateways	Concentrated among digitally capable SMEs	Technical integration and platform dependence	Plug-and-play merchant tools and Khmer-language interfaces
Supply-chain finance	Early-stage but high potential	Lack of digitized invoicing and verified receivables	E-invoicing standards and data-sharing frameworks
Digital working-capital credit	Limited but strategically important	Credit-history gaps and pricing concerns	Alternative-data scoring, credit guarantees, responsible lending rules
Digital micro-insurance	Low adoption	Low trust and limited product understanding	Consumer education and simple claims processes

Payment-led inclusion should not be overstated. A merchant who accepts KHQR is not automatically creditworthy, insured, or financially resilient. However, payment data can become the foundation for additional services if governed responsibly. The central policy task is to convert payment histories into useful financial identities without exposing users to surveillance, predatory credit, or opaque data-sharing practices.

Financial Literacy and Consumer Risk

Digital finance is opening up access quicker than users grasp the risk. Rural communities, older users, workers with less formal education and first-time digital borrowers can be susceptible to phishing, social engineering, identity fraud, exorbitant fees and inappropriate credit. The ADB's appraisal of Cambodia's financial-sector development program highlights the need of financial literacy and consumer protection as elements of wider inclusion reforms (Asian Development Bank, 2024). This is not a marginal issue. Confidence in digital finance can be lost very rapidly when fraud or mis-selling takes place.

Providers should design for understanding, not just compliance. Fee disclosures should be concise, in the local language and transaction-specific. Digital credit should disclose total repayment responsibilities before acceptance. Apps should make it easy to find their complaint channels. Regulators should keep an eye on repeated borrowing, the build-up of late fees and the concentration of digital lending among vulnerable customers. Financial literacy programs work best if they are connected to the use of real products instead of abstract training.

Cybersecurity and Operational Resilience

Cybersecurity is now a core financial-stability issue. Cambodia's risk environment includes phishing, SIM-swap fraud, fake merchant codes, social engineering through messaging platforms, credential theft, and synthetic identity risks. Institutional exposure is also increasing through reliance on cloud providers, payment processors, identity-verification vendors,

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telecommunications networks, and application programming interfaces. A risk-control matrix clarifies the relationship between vulnerabilities and safeguards, and is presented in table 8:

Table 8. Digital-Finance Risk Categories and Required Controls

Risk Category	Example in Cambodian Digital Finance	Likely Impact	Required Control
Customer Fraud	Phishing, fake QR codes, social engineering	Loss of funds and trust	Transaction alerts, name verification, user education, fraud reimbursement rules
Identity Compromise	SIM swaps, stolen credentials, synthetic IDs	Account takeover and money laundering	Strong authentication, device binding, e-KYC validation, telecom coordination
Operational Outage	Payment rail or cloud-service disruption	Systemic payment interruption	Redundancy, incident reporting, business continuity testing
Third-party Concentration	Dependence on few vendors for cloud or identity	Correlated failure across institutions	Vendor-risk supervision and exit plans
Data Misuse	Excessive sharing of payment and behavioral data	Privacy harm and discrimination	Data minimization, consent standards, audit trails
Model Risk	Biased or opaque credit scoring	Exclusion or unfair lending	Explainability, bias testing, human review, model governance

The maturity of Cambodia's fintech ecosystem will increasingly be judged not only by transaction volume, but by resilience. As cross-border linkages expand, cybersecurity expectations will need to align more closely with regional and international standards.

Regulatory Proportionality and Market Development

Cambodia's regulatory challenge is to preserve innovation while preventing instability, misconduct, and regulatory arbitrage. Activity-based regulation is needed where similar risks arise from similar services, regardless of whether the provider is a bank, wallet, lender, or platform. Entity-based regulation remains necessary where deposit-taking, prudential risk, or systemic importance is involved. The appropriate framework is therefore hybrid.

Proportionality is critical. Small low-risk providers should not face requirements designed for systemic banks. At the same time, fast-growing fintech firms should not remain lightly supervised simply because they began as small innovators. Thresholds based on transaction value, customer numbers, stored balances, complaint volumes, and operational interconnectedness would allow regulation to scale with risk. Particular attention should be paid to digital lending, buy-now-pay-later products, crypto-asset exposure, data protection, and cross-border payment settlement.

Interpretation: Cambodia as a Model of Infrastructure-Led Fintech Transformation

The principal finding of this article is that Cambodia represents an infrastructure-led model of fintech competition. In this model, the central bank does not merely regulate private innovation after it occurs. It actively shapes the competitive architecture by providing interoperable infrastructure. This has three consequences.

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First, public infrastructure reduces fragmentation but consumers and merchants do not need to navigate separate closed-loop systems for every bank or wallet. Second, interoperability intensifies competition by making it easier for customers and merchants to transact across providers. Third, banks are compelled to transform because they can no longer rely on proprietary networks as a protective moat. They must compete through service quality, data capability, credit products, and ecosystem integration.

This does not mean the model is free of risk. Rapid payment growth can conceal weak consumer understanding, underdeveloped fraud protection, uneven cybersecurity capability, and insufficient data-governance rules. The Cambodian model is promising precisely because it demonstrates both the benefits and the supervisory demands of public digital infrastructure.

CONCLUSION

Cambodia's fintech transformation has been shaped by a distinctive institutional architecture. Rather than allowing payments to fragment across proprietary networks, the National Bank of Cambodia created interoperable rails through Bakong and supported standardized QR acceptance through KHQR. This infrastructure has altered the basis of competition. Banks, wallets, and payment-service providers now compete on service quality, user experience, data capability, and adjacent financial services rather than on closed acceptance networks alone.

The empirical evidence is substantial. By 2023, Cambodia's payment ecosystem included 19.7 million e-wallet accounts, 601.3 million payment-service-provider transactions, and USD 75.8 billion in payment-service value. Bakong itself had become a national payment hub with 74 members, approximately 19.5 million connected accounts, 200.93 million transactions, KHR 81.05 trillion in riel-denominated value, and USD 53.76 billion in dollar-denominated value (National Bank of Cambodia, 2024). These figures indicate that digital payments are now central to Cambodia's financial system.

The article makes three contributions. Theoretically, it reframes fintech competition in Cambodia as infrastructure-led coopetition rather than simple disruption. Empirically, it draws together official data and institutional evidence on Bakong, KHQR, digital payments and bank transformation. Methodologically, it proposes hypotheses and statistical models that can guide future quantitative research.

Future policy should focus on five priorities. First, Cambodia should deepen financial and digital literacy in direct connection with product use, especially for rural users, older customers, garment workers, and micro-entrepreneurs. Second, cybersecurity and operational resilience should be treated as system-wide supervisory priorities, with stronger incident reporting, vendor-risk management, and fraud-data sharing. Third, data-protection legislation and sector-specific data-governance rules should clarify consent, data minimization, cross-border transfer, and algorithmic accountability. Fourth, SME-focused digital finance should move beyond payments toward responsible working-capital credit, e-invoicing, and supply-chain finance. Fifth, future research should test whether Bakong and KHQR adoption measurably affects account use, SME credit access, bank digital investment, and riel-denominated transaction shares.

Cambodia's experience does not imply that central banks should displace private fintech innovation. It suggests a more precise lesson: in markets where fragmentation, exclusion, and trust deficits constrain digital finance, public infrastructure can create the conditions under which private innovation becomes more competitive, more inclusive, and easier to supervise. The durability of Cambodia's fintech gains will depend on whether this balance between public rails and private differentiation can be maintained as the ecosystem becomes more complex.

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