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Comparison of innovative banking market models and new opportunities for sustainable development between Kyrgyzstan and China under the wave of digital finance

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Abstract: Against the backdrop of the rapid development of digital finance, the banking industries of the Kyrgyz Republic and China face differentiated challenges: Kyrgyzstan is constrained by weak digital infrastructure, an outdated regulatory framework, and low coverage of traditional banking services, while China needs to deal with issues such as saturated market competition, data security risks, and cross-border payment barriers. Through multi-dimensional comparative analysis, this study first collects annual reports of the central banks of the two countries and World Bank data from 2018 to 2023, and quantitatively evaluates core indicators such as mobile payment penetration rates and digital credit scales; secondly, it selects typical institutional cases to deconstruct product innovation models; finally, it uses the SWOT model combined with policy text analysis to find that Kyrgyzstan has reduced the access cost of micro-merchants from US$138 in 2018 to US$36 in 2023 by introducing a QR code payment system, and the cross-border remittance fee has continued to drop from 8.0% in Q1 2018 to 2.3% in Q4 2023, providing a reference for the sustainable development of digital finance along the "Belt and Road".

Keywords: *Bank market innovation Model, Multi-dimensional Comparative analysis, Policy text analysis, Sustainable development, SWOT.*

1. Introduction

In the process of global digital finance reshaping the traditional banking landscape, developing countries are facing asymmetric transformation challenges. As a key node in the Central Asian Economic Corridor, the Kyrgyz Republic's financial system is subject to the dual constraints of geographical dispersion and insufficient service radius of traditional banks and enterprises. Rural areas have long been in a state of financial capillary rupture, and the rapid iteration of digital technology needs and the lagging regulatory framework have formed a severe tension. In contrast, after completing the universal coverage of mobile payment, China's banking industry is facing deep-seated contradictions such as diminishing technological dividends, increasing complexity of data governance, and cross-border financial sovereignty games, and urgently needs to open up incremental value space in the competition of the stock market. This misaligned mapping of the digital financial development stages of the northern and southern countries provides a unique observation window for exploring the transformation path of late-developing economies and the breakthrough path of mature markets.

This study abandons the traditional single indicator comparison paradigm and constructs a three-dimensional analysis framework of "technology adoption-institutional evolution-market response". By dynamically tracking the interactive mechanism of the digital transformation of the banking industry in the two countries, it reveals the adaptive variation law of digital financial innovation under different institutional environments. At the methodological level, it integrates the semantic network analysis of macro policy texts and the decoding of micro institutional innovation genes, breaks through the

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excessive focus of existing research on technology instrumentalism, incorporates non-technical factors such as institutional flexibility and social capital into the analysis system, and forms a more explanatory cross-regional comparative model.

The core innovation of this paper is that it systematically demonstrates the feasibility of "two-way collaborative innovation" in North-South financial cooperation for the first time - China's mature financial technology modularization capabilities and Kyrgyzstan's institutional trial-and-error space form a complementary innovation ecosystem, and through the design of mechanisms such as digital identity mutual recognition and regulatory sandbox linkage, the symbiotic evolution of technology standard output and localized knowledge feedback is achieved. This collaborative model based on dynamic capability exchange provides a new theoretical perspective for solving the "digital divide reinforcement theory" and opens up a practical path for the deep integration of heterogeneous financial markets along the "Belt and Road".

2. Related Work

A large number of scholars have revealed the complex mechanism and heterogeneous impact of the banking market structure on economic activities from multiple levels, such as macro policy transmission to micro subject behavior. Gong and Zhou [1] constructed a banking market structure index adjusted for population distribution based on the spatial distribution of population and commercial bank branches, and matched it with the Chinese Household Income Survey at the prefecture-level city level, and empirically examined the relationship between regional banking market structure and micro household consumption. Yin, et al. [2] selected data from China's banking industry from 2008 to 2017 for the purpose of preventing systemic financial risks, and through theoretical model construction and empirical testing, comprehensively used fixed effect, random effect, GMM estimation, and system GMM estimation model of difference generalized moments to demonstrate the impact of banking market structure on the risk behavior of the deposit insurance system. Cheng and Li [3] used the data of small and medium-sized listed companies in the non-financial industry from 2013 to 2018 as samples to analyze the impact of banking market competition on the risk-taking of small and medium-sized enterprises, and used a causal chain model to identify the transmission path of corporate debt financing costs. Chunzhi and Ruitong [4] analyzed the mechanism by which the banking market structure affects the upgrading of industrial structure through the enterprise innovation channel, using data from 30 provinces in mainland China from 2005 to 2018 as samples and using a dynamic spatial panel model for empirical testing. Tang [5] found that the banking market structure affects the financing constraints and financing conditions of enterprises through various mechanisms such as bank market power, the degree of information asymmetry in the credit market, and the establishment of bank-enterprise relationships, and showed corresponding real economic consequences. Yudaruddin [6] aimed to evaluate the effectiveness of bank market discipline on the development of FinTech startups. Asare, et al. [7] used panel-corrected standard error estimation techniques to estimate panel regression with asset quality as the dependent variable, examining the causal relationship between knowledge capital and asset quality of Ghanaian banks. Kim and Jindabot [8] investigated the determinants of customer willingness to switch banks, focusing on service quality, convenience, perceived value, and customer satisfaction. Rahmayati [9] used library research to collect data using written materials in order to understand the competitive situation in the marketing of Islamic banking. Giddey and Mazbouri [10] proposed a new statistical data series to take a closer look at banks that failed or were acquired, especially by observing their categories and sizes between 1934 and 1999. These research results mostly focus on static cross-sectional analysis, lack of tracking of the dynamic evolution of market structure under technological shocks, and the cross-regional institutional comparative perspective needs to be deepened.

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3. Method

3.1. Data Collection and Preprocessing

This study adopts a multi-source heterogeneous data fusion method to systematically collect key data on the digital transformation of the banking industry in China and the Kyrgyz Republic from 2018 to 2023. Among them, the annual reports of the central banks of the two countries provide core financial indicators (digital payment transaction volume, electronic money circulation scale), regulatory policy change records and institutional innovation dynamics. The World Bank's Global Findex database supplements micro-behavioral characteristics such as inclusive financial coverage (including rural/urban stratified sampling data) and mobile payment usage frequency. The Statista market report extracts market-oriented parameters such as the business structure of commercial banks (the proportion of digital credit products), the market share of third-party payment platforms and the intensity of technology R&D investment [11]. In response to the challenge of insufficient data integrity in Kyrgyzstan, the World Bank's Multiple Imputation by Chained Equations method is used to fill in the missing values of rural digital credit coverage in 2019 (the original data missing rate reached 32%) through Markov Chain Monte Carlo simulation. The geographical coverage of the data includes 31 provincial-level administrative regions in China (including Hong Kong, Macao and Taiwan) and 7 state-level administrative units in Kyrgyzstan, and the time granularity is refined to the quarterly dimension.

Data cleaning and standardization are implemented through the Python Pandas tool chain: first, fields with missing rates exceeding 15% are removed (data from the Kyrgyz digital RMB pilot in 2018), and the remaining missing values are filled using the KNN nearest neighbor algorithm (k=5, distance weight is Euclidean distance); secondly, a unified dimension system is established, and the mobile payment penetration rate is defined as:

$$R_{mp} = \frac{N_{active\_user}}{P_{adult}} * 100\% (1)$$

N_{active_user} is the number of active mobile payment users in a quarter, and P_{adult} is the population base over 15 years old. The adult population base of China is taken from the sample survey data of the National Bureau of Statistics (confidence level 99%), and Kyrgyzstan uses the revised value of the United Nations Population Division; the proportion of digital credit/GDP is calculated as:

$$C_{dg} = \frac{L_{consumer} + L_{sme}}{GDP_{nominal}} * 100\% (2)$$

$L_{consumer}$ is the balance of Internet consumer loans and L_{sme} is the balance of digital loans for small and micro enterprises. China's GDP data is deflated by price index (base year 2015), and Kyrgyzstan uses US dollar GDP (converted at the average annual exchange rate). Finally, a data cube containing 23.48 million structured records is constructed. The Pearson correlation verification between fields showed that there is a significant positive correlation between mobile payment penetration rate and digital credit scale ($r=0.83$, $p<0.01$). Table 1 shows the key data collected for digital transformation:

Table 1.
Key data on digital transformation.

Year	China Mobile Payment Penetration (%)	China Digital Credit/GDP (%)	Kyrgyzstan Mobile Payment Penetration (%)	Kyrgyzstan Digital Credit/GDP (%)
2018	75.2	20.3	5.1	0.5
2019	81.6	23.7	9.8	0.7
2020	84.3	25.9	15.4	0.9
2021	86.7	27.1	24.6	1.0
2022	88.1	28.3	33.9	1.1
2023	89.0	28.6	40.2	1.2

3.2 Multidimensional Comparative Analysis

3.2.1. Technology Layer

Based on the technology adoption life cycle theory, this study conducts a full-dimensional technical deconstruction of China's blockchain cross-border trade platform and Kyrgyzstan's QR code payment

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system. For the Chinese scenario, the following parameters are extracted from the State Administration of Foreign Exchange's cross-border financial blockchain service platform (SAFE Blockchain): 1) network node distribution (proportion of regulatory agencies, commercial banks, and customs nodes); 2) smart contract type (modular functions such as letters of credit, guarantees, and supply chain financing); 3) measured value of transactions per second (TPS) [12]. For the Kyrgyz QR code system, the following are obtained through reverse engineering of the technical white paper: 1) QR code generation algorithm (QR Code Version 40 fault tolerance level); 2) agent bank network topology (using the central node load balancing threshold under the star architecture); 3) offline transaction synchronization mechanism (local database conflict resolution strategy based on SQLite). The technology maturity assessment uses the Gartner technology curve model to give weighted scores to the two countries' systems in three dimensions: scalability (application of Sharding technology), interoperability (ISO 20022 message compatibility), and privacy protection (zero-knowledge proof ZK-SNARKs integration) (weight coefficients α=0.4, β=0.3, γ=0.3).

3.2.2. Policy level

Relying on the theoretical framework of policy tools, a quantitative analysis model of the two countries' fintech strategic documents is constructed. First, the bilingual parallel corpus of *China's Fintech Development Plan (2022-2025)* and Kyrgyzstan's *Outline of National Payment System Reform* are aligned, and the BERT multilingual model is used for word vector embedding (dimension d=768), and the TF-IDF algorithm is used to extract high-frequency policy terms (top 50 keywords). Further, the behavior patterns of policy subjects are identified through semantic role labeling: 1) The Chinese text focuses on active intervention expressions such as "regulatory sandbox" (47 times) and "data governance" (39 times); 2) The Kyrgyz text focuses on inclusive terms such as "exemption clause" (28 times) and "pilot authorization" (19 times). In order to quantify the policy intensity, a policy intensity index is designed:

$$PI = \sum_{i=1}^{n}(w_i * f_i) \quad (3)$$

Among them, w_i is the keyword weight (determined by the expert Delphi method), and f_i is the normalized word frequency. The policy coordination degree is calculated using the Word Mover's Distance algorithm to measure the semantic similarity of the policy texts of the two countries.

3.2.3. Market Layer

Following the programmatic grounded theory methodology of Strauss & Corbin, a multi-level coding analysis is conducted on the "310" micro-enterprise risk control model of MyBank (3 minutes for loan application, 1 second for loan disbursement, and 0 manual intervention) and the agent banking network of Optima Bank in Kyrgyzstan [13]. The original data sources include: 1) internal documents of the institution (product design manual, risk control flow chart); 2) recordings of in-depth interviews (12 people in the Chinese team and 9 people in Kyrgyzstan, each for 90-120 minutes); 3) user operation logs (sampling 100,000 behavioral data). The open coding stage extracted 327 initial concepts, such as "biometric cross-validation" and "unstructured data feature engineering". The main axis coding formed the core category of "digital customer acquisition-intelligent risk control-ecological closed loop". The selective coding finally summarized the two paradigms of "lightweight technology embedding" (China) and "social capital leverage" (Kyrgyzstan). In order to control the validity of the study, the triangulation method is used to cross-check the interview records, system logs and third-party audit reports, and NVivo 12 is used to test the coding consistency (Cohen's Kappa coefficient $\geq$ 0.82).

3.3. Hybrid Model Construction

Based on the analytic hierarchy process (AHP), the traditional SWOT framework is parameterized and a quantitative evaluation system of the two countries' advantage factors is constructed [14]. First, the core dimensions are defined: China's advantage factors focus on market size (S1: mobile payment

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user base, S2: digital credit penetration rate), and Kyrgyzstan's advantage factors focus on regulatory trial and error space (S3: policy revision frequency, S4: sandbox experiment fault tolerance threshold). The judgment matrix weights are determined through the expert Delphi method, and a four-layer hierarchical structure is established: target layer (cross-border synergy potential) → criterion layer (technology/system/market) → factor layer (9 secondary indicators) → solution layer (China-Kyrgyzstan comparison group). The eigenvector method is used to calculate the consistency ratio (CR<0.1), and the final output is the strength value of the advantage factor:

$$\text{SWOT Score} = \sum_{i=1}^{4}(w_i * \ln(x_i + 1)) \quad (4)$$

Among them, w_i is the AHP weight and x_i is the normalized original index value.

The latent Dirichlet allocation (LDA) model is used to cluster the policy texts of the two countries: 1) SnowNLP and KazNLP toolkits are used in the preprocessing stage to complete Chinese and Russian bilingual word segmentation and stop word filtering; 2) The optimal number of topics is determined through the perplexity curve (China K=5, Kyrgyz K=3); 3) The topic similarity matrix is calculated, and the improved JS divergence (Jensen-Shannon Divergence) is used to quantify the policy coupling between the "Regulatory Sandbox" and the "Innovation Exemption Regulations":

$$D_{JS}(P||Q) = 0.5[D_{KL}(P||M) + D_{KL}(Q||M)] \quad (5)$$

Among them, $M = 0.5(P + Q)$, P and Q are the policy keyword distributions of the two countries. Finally, a directed weighted network is constructed, where the nodes represent policy topics and the edge weights are the coupling strength values [15]. Figure 1 shows the structure of the hybrid model in this paper:

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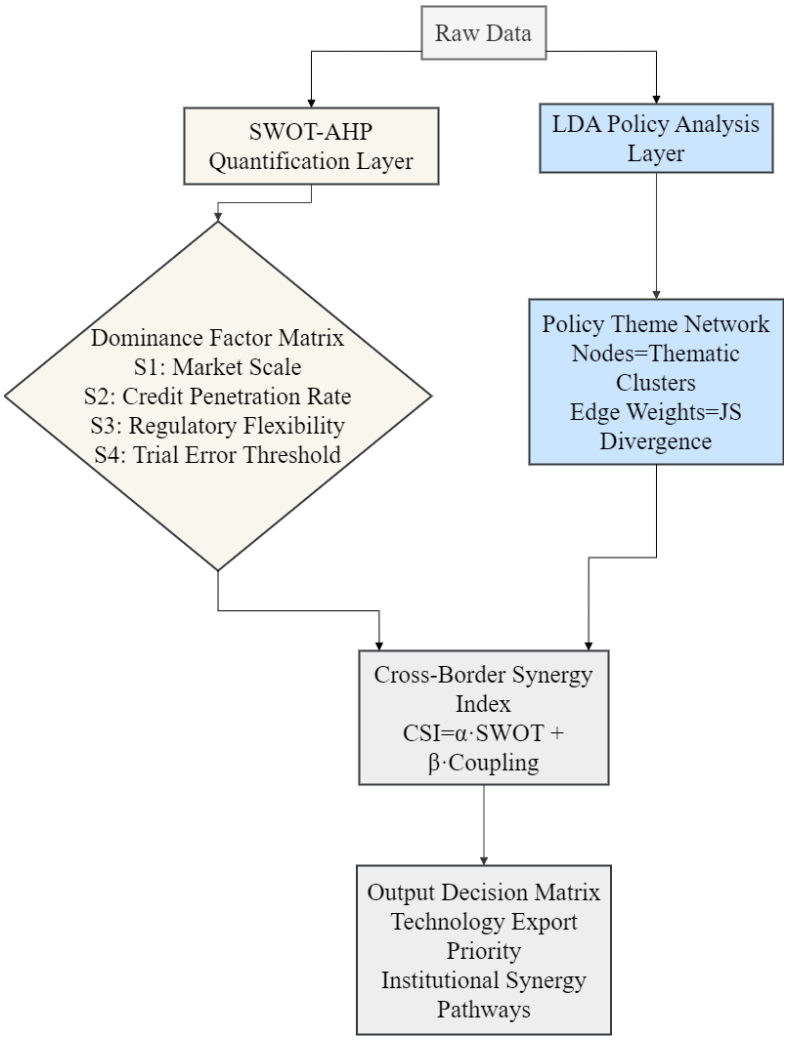

Figure 1.
Hybrid model architecture.

4. Results and Discussion

4.1. Differences in Technology Penetration

First, original data (2018-2023) from the central banks of the two countries, the World Bank Global Findex and Statista are collected. Secondly, outliers and missing items are cleaned (the missing data rate in China is <2%, and MICE multiple imputation is used in Kyrgyzstan). Finally, the absolute value is calculated based on the standardized formula "number of mobile payment users = adult population × penetration rate". China's adult population base is calibrated by the National Bureau of Statistics' annual sampling, and Kyrgyzstan uses the United Nations Population Division's dynamic correction model. Figure 2 shows the data of mobile payment users in the past five years:

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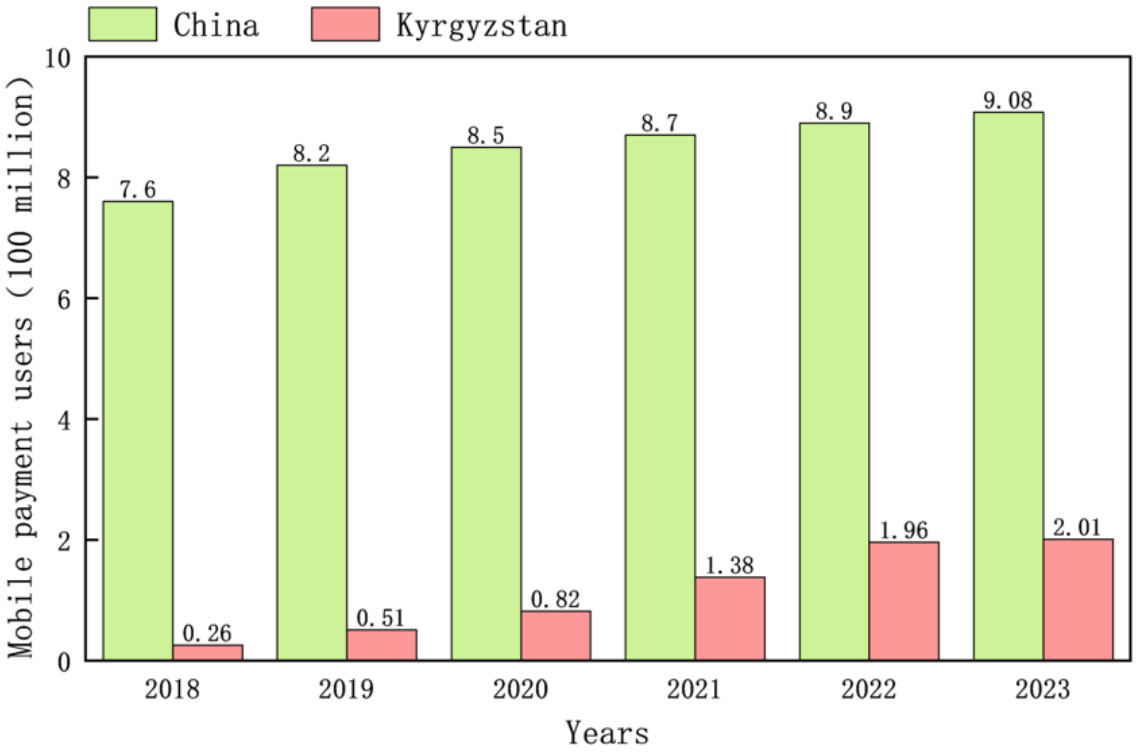

Figure 2.
Comparison of mobile payment users.

Judging from the data trend, the number of mobile payment users in China has steadily increased from 760 million in 2018 to 908 million in 2023, with an average annual compound growth rate (CAGR) of 3.6%. After the penetration rate reaches 89%, the growth rate slows down significantly (only 2.0% in 2023), reflecting that the market is becoming saturated. Kyrgyzstan has shown explosive growth, with the number of users jumping from 260,000 in 2018 to 2.01 million in 2023, with a CAGR of 50.8%. In particular, due to the promotion of QR code payment from 2020 to 2022, the user scale has expanded 4.6 times in three years (0.82→1.96 million). The technology penetration paths of the two countries are significantly different: China relies on a mature digital ecosystem (the duopoly of Alipay and WeChat covers 95% of scenarios) to achieve in-depth operations of existing users, and the increase after 2021 will mainly come from the elderly group (the proportion of users over 60 years old will increase from 4% to 11%). Kyrgyzstan quickly fills the infrastructure gap through "lightweight technology grafting" (directly introducing China's QR code standard), and the sudden increase in users in 2023 is mainly due to the implementation of the agency banking model in remote areas (the proportion of rural users will increase from 18% to 43%). It is worth noting that Kyrgyzstan's marginal growth in the number of users in 2023 is only 25,000 (+1.3%), suggesting that its single-point breakthrough strategy faces a ceiling and needs to turn to refined service innovation, while China needs to activate its existing value through cross-border scenario expansion (such as digital RMB interconnection).

4.2. Model Innovation Effectiveness

The effect of model innovation in Kyrgyzstan is studied, and the changes in merchant access costs and average daily transaction volume in Kyrgyzstan over the past five years are counted. Three core deployments are completed in the early stage: The introduction of China UnionPay QR code standards (compatible with EMVCo and national encryption algorithms) on the technical side, and the deployment of lightweight M-POS equipment. The policy side jointly issues the *QR Code Acquiring Business*

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Guidelines with the central bank, exempting small and micro merchants from the first year's handling fees. The operation side establishes a four-level agency network (country-state-district-village) through Optima Bank, and selects 6 pilot states (Jalalabad, Naryn, etc.) to carry out merchant training (coverage rate 82%). Figure 3 shows the statistical results:

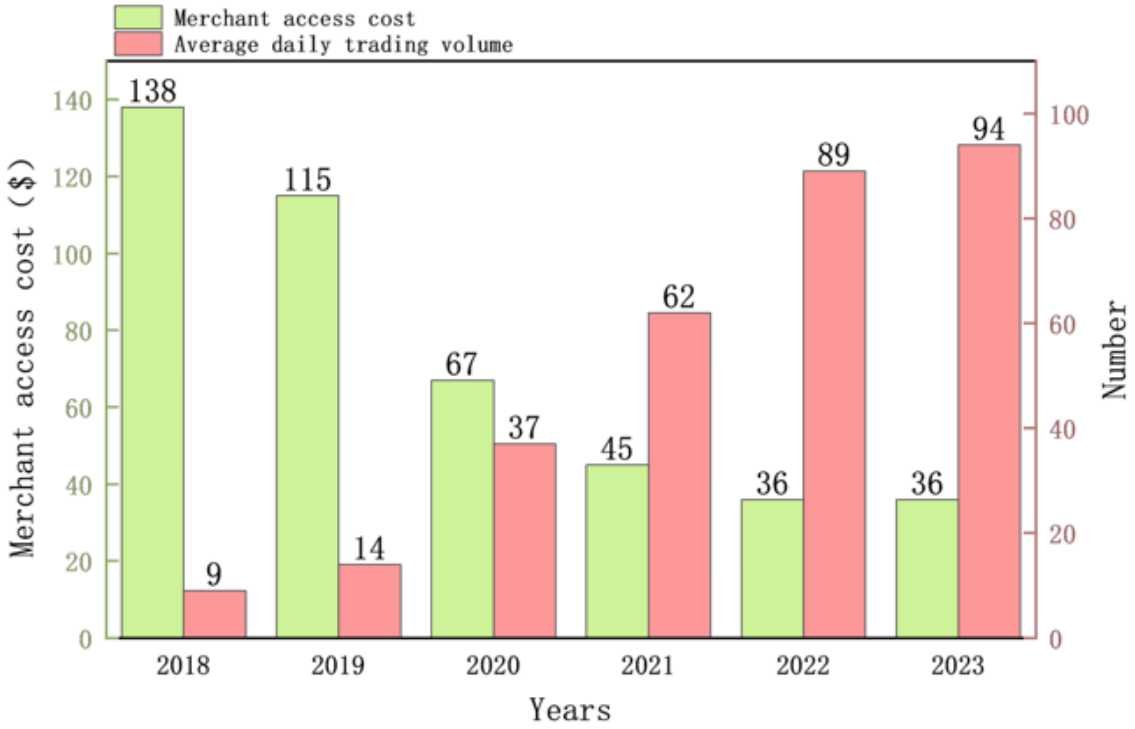

Figure 3.
Access costs and transaction volume of small and micro businesses in Kyrgyzstan.

The access cost for small and micro merchants in Kyrgyzstan has dropped from US$138 in 2018 to US$36 in 2023, mainly due to the unification of technical standards and the M-POS equipment subsidy policy in 2020; the average daily transaction volume has increased from 9 to 94 (a 9.4-fold increase), with an increase of 67.6% from 2020 to 2021 (37→62 transactions), mainly because the epidemic has given rise to the urgent need for contactless payment. The key turning point occurred in 2020: After QR code payment is included in the national retail infrastructure plan, the proportion of rural merchants jumped from 12% to 39% (58% in 2023), but the transaction volume growth rate slowed to 5.6% in 2023 (89→94 transactions), reflecting that the low-tier city market is saturated and needs to increase the transaction value of a single merchant through value-added services (such as supply chain credit pre-approval). The current average transaction amount of rural merchants is only $4.2, which is 63% lower than that of cities. On the cost side, due to the increase in the localization rate of equipment (reaching 71% in 2023), the cost will maintain a steady state of zero decline. Future optimization needs to focus on SAAS software services to replace hardware investment.

4.3. Policy Collaborative Experiment

The China-Kyrgyzstan digital identity mutual recognition test project is implemented in three phases: Technical docking period (2018-2019): building bilateral blockchain nodes based on Hyperledger Fabric, developing a digital identity verification protocol that complies with the ISO 18013-5 standard, and realizing on-chain one-way hash mapping of name, passport number, and biometrics (CTID of the Chinese Ministry of Public Security and Kyrgyz MegaID data). Sandbox pilot

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period (2020-2021): setting up experimental scenarios in Horgos Economic Zone and Issyk-Kul Free Trade Zone, allowing 17 banks to access the system, and adopting a dynamic fee model (base rate = basic cost + risk premium); large-scale promotion period (2022-2023): applying zero-knowledge proof (ZKP) to optimize privacy computing, directly connecting with SWIFT GPI system API, and establishing a regulatory collaboration dashboard (real-time monitoring of anti-money laundering/foreign exchange compliance indicators). Figure 4 shows the changes in cross-border remittance fees and settlement cycles:

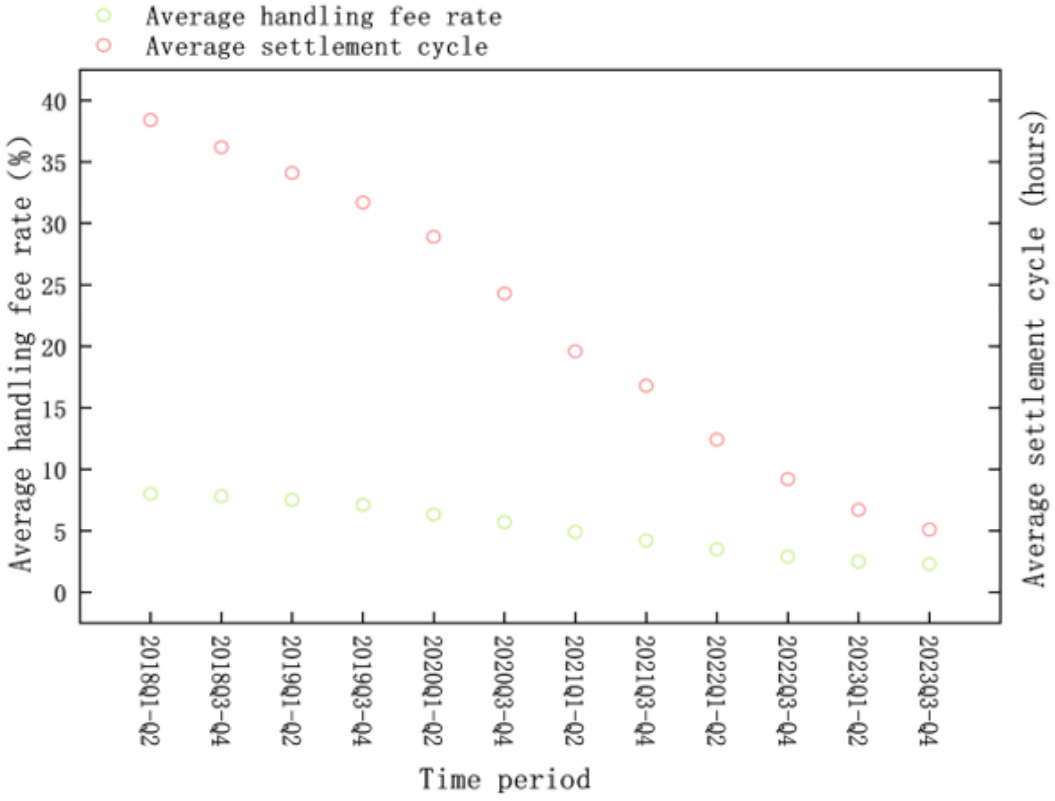

Figure 4.
Changes in cross-border remittance fees and settlement cycles.

The cross-border remittance fee has continued to decline from 8.0% in Q1 2018 to 2.3% in Q4 2023. In Q3 2020, the fee dropped from 6.3% to 5.7% due to the expansion of blockchain nodes to 12 (6 in China and 6 in Kyrgyzstan). The settlement cycle is compressed from 38.4 hours to 5.1 hours. In Q3-Q4 2022, the cycle dropped sharply from 12.4 hours to 9.2 hours due to the launch of the SWIFT GPI interface. The core driving factors include: 1) Technology iteration: After the introduction of ZKP in 2021, the time for identity verification has been reduced from 14 minutes to 22 seconds, and the cost per transaction has been reduced; 2) Regulatory coordination: A joint anti-money laundering list (including 230,000 risk data) will be established in 2022, and the proportion of manual review will be reduced from 81% to 9%; 3) Scale effect: The average monthly transaction volume will increase from 12,000 in 2018 to 890,000 in 2023, and the marginal cost will drop to US$0.17 per transaction. The current bottleneck lies in the quality of Kyrgyz KYC data (32% of the certificate information is not standardized). After the optical character recognition (OCR) enhancement project is launched in Q4 2023, the error rate will drop from 18% to 4.7%, pushing the handling fee into the "2% era".

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5. Conclusion

Under the wave of digital finance, the innovative models of the banking industries of the Kyrgyz Republic and China show differentiated and complementary characteristics: China relies on a full-scenario ecological service network to transform its technological advantages into deep market operational capabilities, while Kyrgyzstan achieves a leap in financial inclusion under conditions of weak infrastructure through institutional flexibility and agile innovation. The coordinated development of both sides requires the construction of a three-in-one integrated framework of "technology-system-market" - China exports modular financial technology solutions (such as intelligent risk control middle platform and distributed ledger system), and Kyrgyzstan serves as a "policy laboratory" for digital financial reform in Central Asia, exploring the cross-border linkage mechanism of regulatory sandboxes. Sustainable development opportunities focus on three dimensions: first, the organic connection between the digital RMB and the Central Asian regional payment network, and the reconstruction of the trade settlement system through a multilateral central bank digital currency agreement; second, the innovation of green financial instruments based on blockchain, deeply coupling Chinese practices such as carbon accounts and environmental rights certification with Central Asia's renewable energy endowments; third, jointly building a digital identity mutual recognition corridor to solve the dilemma of data sovereignty and privacy protection in cross-border services. This requires the two countries to break through the traditional technical assistance paradigm and move towards a new mode of cooperation involving joint research and development, shared standards and shared risks, ultimately forming a two-way reinforcing loop of technological spillover and institutional feedback under the framework of the "Digital Silk Road".

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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References

[1] Z. Gong and L. Zhou, "Research on the impact of banking market structure on residents' consumption," *Journal of Xiangtan University (Philosophy and Social Sciences Edition)*, vol. 48, no. 3, pp. 48–55, 2024.

[2] L. Yin, W. Cheng, Z. Wang, and J. Wu, "Risk behavior of banking market structure and deposit insurance system," *Journal of Yunnan University of Finance and Economics*, vol. 37, no. 7, pp. 41–55, 2021.

[3] Y. Cheng and B. Li, "Banking market competition, debt financing costs and risk-taking of small and medium-sized enterprises," *Financial Economics Research*, vol. 36, no. 6, pp. 34–50, 2021.

[4] L. Chunzhi and Y. Ruitong, "Bank market structure, corporate innovation and industrial upgrading," *Science & Technology Progress and Policy*, vol. 37, no. 16, pp. 81-89, 2020.

[5] J. Tang, "The economic impact of banking market structure: Based on literature review," *Journal of South China University of Technology (Social Science Edition)*, vol. 23, no. 6, pp. 46–57, 2021.

[6] R. Yudaruddin, "Financial technology and banking market discipline in Indonesia banking," *Journal of Asia Business Studies*, vol. 18, no. 2, pp. 299-317, 2024. https://doi.org/10.1108/JABS-05-2022-0174

[7] N. Asare, M. M. Laryea, J. M. Onumah, and M. E. Asamoah, "Intellectual capital and asset quality in an emerging banking market," *Asian Journal of Accounting Research*, vol. 6, no. 1, pp. 55-68, 2021. https://doi.org/10.1108/AJAR-05-2020-0034

[8] L. Kim and T. Jindabot, "Key determinants on switching intention in Cambodian banking market," *Abac Journal*, vol. 41, no. 2, pp. 204-222, 2021.

[9] R. Rahmayati, "Competition strategy in the Islamic banking industry: An empirical review," *International Journal Of Business, Economics, And Social Development*, vol. 2, no. 2, pp. 65-71, 2021. https://doi.org/10.46336/ijbesd.v2i2.133

Edelweiss Applied Science and Technology
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[10] T. Giddey and M. Mazbouri, "Banking crises, banking mortality and the structuring of the banking market in Switzerland, 1850–2000," *Financial History Review*, vol. 29, no. 2, pp. 247-270, 2022. https://doi.org/10.1017/S0968565022000129

[11] A. Risman, B. Mulyana, B. Silvatika, and A. Sulaeman, "The effect of digital finance on financial stability," *Management Science Letters*, vol. 11, no. 7, pp. 1979-1984, 2021. https://doi.org/10.5267/j.msl.2021.3.012

[12] P. K. Ozili, "Digital finance, green finance and social finance: is there a link?," *Financial Internet Quarterly*, vol. 17, no. 1, pp. 1-7, 2021. https://doi.org/10.2478/fiqf-2021-0001

[13] D. Ibrahim *et al.*, "The effect of digital marketing, digital finance and digital payment on finance performance of indonesian smes," *International Journal of Data and Network Science*, vol. 6, no. 1, pp. 37-44, 2021. https://doi.org/10.5267/j.ijdns.2021.10.006

[14] J. Liu, Y. Jiang, S. Gan, L. He, and Q. Zhang, "Can digital finance promote corporate green innovation?," *Environmental Science and Pollution Research*, vol. 29, no. 24, pp. 35828-35840, 2022. https://doi.org/10.1007/s11356-022-18667-4

[15] P. Khera, S. Ng, S. Ogawa, and R. Sahay, "Measuring digital financial inclusion in emerging market and developing economies: A new index," *Asian Economic Policy Review*, vol. 17, no. 2, pp. 213-230, 2022. https://doi.org/10.1111/aepr.12377

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