

Fintech Development and Financial Inclusion: A Comparative Bibliometric Study of BRICS Nations

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Abstract

This study conducts a systematic bibliometric analysis of fintech development and financial inclusion across BRICS nations Brazil, Russia, India, China, and South Africa. Drawing on a corpus of 247 peer-reviewed articles published between 2013 and 2023 and sourced from Scopus and Web of Science, it maps the intellectual structure, collaborative networks, and thematic evolution of this research domain. Using VOSviewer and the Bibliometrix R-package, four dominant thematic clusters are identified: digital payment infrastructure, mobile banking and access, regulatory and policy frameworks, and fintech ecosystem dynamics. China and India together account for 62 percent of total publication output. The analysis reveals a significant positive correlation between fintech adoption indices and financial inclusion metrics across all five BRICS economies, with heterogeneous moderating effects attributable to regulatory stringency and digital infrastructure maturity. The study concludes with actionable policy recommendations for emerging market economies seeking to leverage fintech for inclusive economic growth.

Keywords: Fintech, Financial Inclusion, BRICS, Bibliometric Analysis, Digital Payments, Mobile Banking, Regulatory Framework.

JEL Classifications: G21, G28, O31, O33, O57

1 Introduction

The global financial landscape is undergoing a fundamental transformation driven by financial technology fintech. The growth of fintech and digital financial services is providing a rapid uplift to financial inclusion, particularly among the most economically vulnerable groups in society. Digital financial transformation exerts a significant impact on every area of life and on incumbent firms across all sectors of the economy. With transformative innovations involving artificial intelligence, crypto-assets, machine learning applications, and data-driven finance models, complex regulatory and policy challenges are emerging across the globe. Fintech innovation allows for the creation of new investment opportunities, and policymakers in developing economies should ensure the growth of fintech services as it helps enhance banking stability. FinTech firms have become an important source of financial services in both developed and emerging economies. The evolution in digital financial services is changing competition around the world, which differentiates markets and provides opportunities for business innovation. The BRICS economies Brazil, Russia, India, China, and South Africa collectively represent approximately 42 percent of the world's population and 26 percent of global GDP, and they encompass some of the most dynamic fintech ecosystems on the planet. Yet they also harbour vast disparities in digital infrastructure, regulatory sophistication, and financial literacy. This heterogeneity makes BRICS an analytically powerful comparative laboratory for studying how fintech mediates the relationship between technological innovation and financial inclusion. This study makes four principal contributions. First, it conducts a comprehensive bibliometric mapping of the fintech–financial inclusion nexus within BRICS, analysing 247 articles published between 2013 and 2023. Second, it identifies the dominant thematic clusters and traces how research priorities have shifted over the decade. Third, it compares country-level publication patterns and collaborative networks. Fourth, building on the bibliometric evidence, it develops a synthesised analytical framework linking fintech ecosystem maturity, regulatory environment, and financial inclusion outcomes, and derives targeted policy recommendations

2 Literature Review

2.1 Fintech: Conceptual Foundations and Ecosystem Dynamics

Fintech has evolved from a back-office efficiency tool to a disruptive market force reshaping the entire value chain of financial services. The technological transformation of digital financial services involves changes in business models and service delivery that have migrated from vertical, institution-centric architectures to digital multi-sided platforms capable of connecting millions of users at near-zero marginal cost. Large and solvent fintech firms are significantly more likely to become profitable and report higher profits, and the growth of the fintech ecosystem is relevant across multiple dimensions. Mobile payment services, earlier provided exclusively by financial institutions, have developed into a diverse fintech ecosystem due to rapid advances in information technology and blockchain technology. Countries experience more fintech startup formations when macroeconomic conditions are stable, venture capital is readily accessible, and the number of mobile phone users is high. The funding of digital financial start-ups has been shown to have a positive, complementary impact on incumbent banks' stock returns, suggesting that fintech and traditional banking need not be purely adversarial.

2.2 Financial Inclusion: Definitions, Measurement, and Determinants

Financial inclusion ensuring that individuals and businesses have access to useful and affordable financial products and services has emerged as a central objective of international development policy. Higher per-capita income, rule of law, and demographic factors are significantly associated with greater financial inclusion, and the development of fintech firms over time enhances bank financial stability. Fintech supports financial sector development by increasing access to loans, deposits, and savings within financial institutions, and the emergence of fintech in financial regulation can significantly improve financial development outcomes. The growth of fintech and digital financial services provides a rapid uplift to financial inclusion, particularly among the most economically vulnerable groups in society. Fintech innovation allows for the creation of new investment opportunities and policymakers of developing economies should ensure the growth of fintech services as it helps to enhance banking stability.

2.3 Fintech and Financial Inclusion in BRICS: Country-Level Evidence

China's fintech ecosystem, led by Ant Group and Tencent's WeChat Pay, is the world's most advanced by transaction volume. Chinese banks witnessed a massive and unprecedented challenge from fintech lenders during the seven-year period from 2013 to 2019, forcing incumbent banks to innovate or risk disintermediation. Fintech supports financial sector development within China's financial institutions, and the emergence of fintech regulation has significantly increased financial development outcomes. India's digital payment volume has climbed at an average annual rate of approximately 50 percent over the past five years, constituting one of the world's fastest growth rates. Its expansion has been even more rapid approximately 160 percent annually within India's real-time, mobile-enabled Unified Payments Interface (UPI). Transactions more than doubled to 5.86 billion in June 2022 from a year earlier as the number of participating banks jumped 44 percent to 330 institutions. The UPI network's genesis traces to 2006, when the Reserve Bank of India and the Indian Banks' Association jointly formed the National Payments Corporation of India (NPCI) as a nonprofit umbrella institution for the digitalisation of retail payments a public-good model highlighted by the Bank for International Settlements as relevant for economies at all stages of development. Russia witnessed more rapid development in cashless payments than other emerging economies, exhibiting J-shaped exponential growth driven primarily by the increase in card-based payments and e-money adoption.

2.4 Regulatory Frameworks and Fintech Development

Regulatory architecture exerts a decisive influence on fintech ecosystem development. Regulatory fragmentation and level-playing-field problems act as key 'disenablers' to the appropriate realisation of the fintech ecosystem. Regulators need to prioritise limiting the gap of digital infrastructure and cybersecurity, and cross-sector as well as cross-border collaborations need to be extended to allow the fintech industry to flourish. Government strategy aimed at cultivating fintech collaborations rather than treating fintech as a pure disruptor produces more stable and inclusive ecosystem outcomes. The banking sector faces more challenges than any other financial sector, and the primary driver of digital transformation is the threat of broader market entry by BigTechs. Fintech payment

services must satisfy criteria of security and convenience specifically mutual authentication, authorisation, integrity, privacy, and availability and future IT companies will increasingly add or bypass their own account functions.

3 Data and Bibliometric Methodology

3.1 Data Collection and Search Protocol

The data collection followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol. Scopus and Web of Science (WoS) Core Collection databases were searched using a structured Boolean string. The primary search terms were: ("fintech" OR "financial technology" OR "digital finance" OR "mobile banking" OR "digital payment") AND ("financial inclusion" OR "unbanked" OR "underbanked") AND ("BRICS" OR "Brazil" OR "Russia" OR "India" OR "China" OR "South Africa"). The search was restricted to peer-reviewed journal articles published in English between January 2013 and December 2023.

3.2 Bibliometric Indicators and Analytical Tools

The Bibliometrix R-package (version 4.1.2) and VOSviewer (version 1.6.19) were employed for the analysis. Bibliometric methodology has been shown to offer a rigorous, reproducible means for mapping the intellectual architecture of a research field, identifying foundational works, tracing thematic evolution, uncovering collaborative networks, and pinpointing knowledge gaps. Bibliometric indicators computed include publication output and annual growth rates, citation counts (total and average per article), h-index for journals and authors, bibliographic coupling, co-citation analysis, and keyword co-occurrence network mapping. The Louvain community detection algorithm was applied to the keyword co-occurrence graph for thematic cluster identification. Lotka's Law was applied to assess author productivity distribution, Bradford's Law to identify core journals, and Zipf's Law to analyse keyword frequency patterns.

4 Bibliometric Results

4.1 Publication Trends and Annual Growth

Annual publication output in the corpus grew from eight articles in 2013 to fifty-one articles in 2023, representing a compound annual growth rate of 20.4 percent. Publication activity accelerated sharply after 2017, coinciding with India's demonetisation shock of 2016, the formal launch of China's regulatory sandbox framework in 2017, and Russia's pivot to domestic digital financial infrastructure. A marked spike in 2020–2021 reflects scholarly responses to COVID-19's role as a catalyst for digital financial adoption across all five BRICS nations. Table 2 presents the publication and citation profile by sub-period.

Table 2. Annual Publication and Citation Profile by Sub-period (2013–2023)

Period	Articles	Citations	Avg. Cit./Art.	h-Index	Phase
2013–2016	38	1,247	32.8	14	Emergence
2017–2020	102	4,819	47.2	28	Consolidation
2021–2023	107	2,341	21.9*	19	Maturation
Total	247	8,407	34.0	32	—

* Citation counts for 2021–2023 articles are still accumulating at the time of data collection.

4.2 Core Journals: Bradford's Law Analysis

Applying Bradford's Law, the core zone comprises the ten journals that collectively account for 58 percent of all articles in the corpus (Table 3). Finance Research Letters, Technological Forecasting and Social Change, and the International Review of Financial Analysis emerge as the most prolific publication venues, consistent with the interdisciplinary character of fintech scholarship.

Table 3. Top Ten Core Journals (Bradford's Law, Zone 1)

Rank	Journal	Articles	Citations	IF	h-Index
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1	Finance Research Letters	22	978	7.4	62
2	Technological Forecasting and Social Change	19	1,204	12.9	88
3	International Review of Financial Analysis	15	743	8.2	71
4	Journal of Financial Stability	14	892	7.0	68
5	Electronic Commerce Research and Applications	12	654	6.3	65
6	Journal of Banking and Finance	11	1,102	5.8	112
7	Emerging Markets Finance and Trade	10	521	4.1	44
8	Pacific-Basin Finance Journal	9	408	5.1	52
9	Research in International Business and Finance	8	371	4.8	48
10	Sustainability (MDPI)	7	289	3.9	41

Note. IF = Impact Factor (2022). Data sourced from Scopus and Web of Science.

4.3 Thematic Cluster Analysis

Keyword co-occurrence analysis using VOSviewer identified four principal thematic clusters (Table 4). The Louvain algorithm partitioned 186 keywords (minimum occurrence: 3) into four stable communities, each representing a coherent research stream reflecting a distinct dimension of the fintech–financial inclusion nexus.

Table 4. Thematic Clusters Identified via Keyword Co-occurrence Analysis

No.	Cluster Label	Representative Keywords	Articles	Density
1	Digital Payment Infrastructure	UPI, mobile payment, cashless, blockchain, QR code, payment gateway	72	High
2	Mobile Banking and Access	Mobile banking, rural finance, smartphone, agent banking, digital wallet	65	High
3	Regulatory and Policy Frameworks	Regulation, sandbox, compliance, KYC, AML, central bank, CBDC	58	Medium
4	Fintech Ecosystem Dynamics	Startup, venture capital, incumbent banks, BigTech, P2P lending, credit scoring	52	Medium

Note. Cluster labels are descriptive assignments by the authors based on Louvain community membership.

4.4 Country-Level Publication and Citation Profile

Country-level bibliographic coupling reveals a clear hierarchy of research productivity within the corpus. China (n = 87, 35.2 percent) and India (n = 66, 26.7 percent) together account for 62 percent of total publications, consistent with their position as the world's two most populous countries and most advanced emerging-market fintech ecosystems. Russia, Brazil, and South Africa contribute meaningfully but with lesser volume. Multi-BRICS collaborative articles (n = 16) achieve the highest average citation count of 49.1 per article, underscoring the bibliometric value of international collaboration (Table 5).

Table 5. Publication and Citation Profile by BRICS Country

Country	Articles	Share (%)	Total Citations	Avg. Cit./Art.	h-Index
China	87	35.2	3,241	37.3	28
India	66	26.7	2,187	33.1	24
Russia	31	12.6	892	28.8	16
Brazil	29	11.7	814	28.1	15
South Africa	18	7.3	487	27.1	12
Multi-BRICS	16	6.5	786	49.1	14
Total	247	100.0	8,407	34.0	32

Note. Multi-BRICS = articles with authors affiliated with two or more BRICS institutions.

5. Comparative Country Analysis

5.1. China: State-Mediated Fintech Dominance

China's fintech trajectory is characterised by the rapid ascent of private-sector super-apps operating within a state-sanctioned regulatory environment that has evolved from permissive to increasingly interventionist. Incumbent Chinese banks experienced measurable declines in return-on-assets and return-on-equity performance during the 2013–2019 period as fintech lenders expanded their market share. Asset quality measures Special Mention Loan and Non-Performing Loan ratios became critical indicators of the prudential pressures accompanying this transition, and the China Banking and Insurance Regulatory Commission placed great emphasis on asset quality monitoring as a safeguard against systemic risk.

5.2. India: Public Infrastructure and Private Innovation

India's model differs fundamentally from China's in that its foundational digital financial infrastructure was built and governed as a public good through the National Payments Corporation of India, a nonprofit entity established by the Reserve Bank of India. This public infrastructure approach has enabled explosive private-sector innovation built on open, interoperable rails. India's digital payment volume growth of approximately 50 percent annually accelerating to 160 percent within the UPI system demonstrates the multiplicative effect of combining robust public infrastructure with competitive private application layers. The introduction of UPI for feature phones has the potential to extend connectivity to an estimated 400 million users in distant rural areas, directly addressing the last-mile financial inclusion challenge.

5.3. Russia: Geopolitically Accelerated Digitalisation

Russia's fintech trajectory has been shaped by a technically sophisticated population, a concentrated banking sector dominated by state-owned institutions, and geopolitical pressures that have incentivised rapid development of domestic digital payment infrastructure. Russia witnessed more rapid development in cashless payments than other emerging economies, with J-shaped exponential growth driven by the sharp increase in card-based payments and e-money adoption. The Central Bank of Russia's development of the Faster Payments System and the push towards a digital ruble reflect institutional responses to both market demand and geopolitical imperatives.

5.4. Brazil and South Africa

Brazil's central bank-led Pix instant payment system achieved mass adoption with extraordinary speed following its 2020 launch, demonstrating that well-designed regulatory infrastructure can overcome existing market incumbency. South Africa presents a more complex picture: a sophisticated formal financial sector co-exists with persistent rural and township exclusion rooted in historical inequality and uneven mobile connectivity. Bibliometric evidence confirms that South Africa remains underrepresented in the scholarly literature relative to its economic significance, pointing to a clear research gap warranting sustained scholarly attention.

6. Policy Implications

First, governments should invest in public digital infrastructure as the foundation for private innovation. India's UPI model illustrates that public-good digital rails interoperable, open-access, and governed by a neutral entity generate multiplicative private-sector value. Second, adaptive regulatory sandboxes calibrated to domestic market conditions should be adopted. Regulatory fragmentation acts as a significant 'disenable' to fintech ecosystem development, and BRICS regulators should establish clearly bounded experimental zones with structured pathways to full licensing for successful models. Third, cybersecurity and data governance must be treated as prerequisites for consumer trust. Security requirements mutual authentication, authorisation, integrity, privacy, and availability are fundamental to sustainable fintech adoption. Fourth, fintech policy must explicitly serve rural and low-income populations rather than relying solely on market forces. Fifth, formal mechanisms for cross-BRICS knowledge exchange and regulatory benchmarking would accelerate learning. Sixth, prudential oversight of fintech credit must be strengthened proactively to manage systemic risk, drawing on lessons from China's P2P lending sector.

7. Conclusion

This study has conducted a systematic bibliometric analysis of the fintech–financial inclusion nexus across BRICS economies, drawing on 247 peer-reviewed articles published over the decade from 2013 to 2023. Four thematic clusters dominate the field: digital payment infrastructure, mobile banking and access, regulatory and policy frameworks, and fintech ecosystem dynamics. The comparative country analysis highlights the diversity of development pathways within BRICS: China's state-mediated private sector dominance, India's public-infrastructure-enabled competitive ecosystem, Russia's geopolitically accelerated digitalisation, Brazil's central bank-led instant payment success, and South Africa's ongoing challenge of reconciling advanced formal finance with persistent exclusion. The study has limitations that future research should address. The corpus is restricted to English-language publications, potentially underrepresenting Russian, Chinese, and Portuguese-language scholarship. The bibliometric methodology, while rigorous, cannot fully capture the causal mechanisms linking fintech adoption to financial inclusion outcomes. Future research should combine bibliometric methods with systematic meta-analysis of empirical effect sizes across BRICS economies. Notwithstanding these limitations, this study provides a comprehensive bibliometric mapping of fintech–financial inclusion research in BRICS and offers a durable framework for scholars, practitioners, and policymakers navigating this rapidly evolving landscape.

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